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Vision

Achieve excellence in agriculture for national prosperity.

Mission

Development and dissemination of improved agricultural technology and providing related services to all stakeholders with emphasis on farmers to achieve an equitable and sustainable agricultural development to ensure food and nutritional security for the nation.

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CONTENTS

FOREWORD

Year 2016 had been a challenging year for the Department of Agriculture in terms of adverse weather conditions prevailed during critical periods of cultivation especially with respect to rice. However the Department was able to achieve a significant progress in the research, development and extension programs during the year.

The research programs are geared to improve the quality characteristics of rice as well as to increase the production of other food crops with a view to restrict imports. Three new varieties of rice, 2 varieties of other field crops, 2 varieties of fruits and 1 variety of vegetable were released during the year. The Department of Agriculture is the major stakeholder of implementing National Food Production program launched with the objective of increasing production of food crops to achieve self sufficiency while reducing food imports.

With the objective of improving agricultural education, new School of Agriculture conducting NVQ level 5 courses has been established at Paranthan and the activities of School of Agriculture, Anuradhapura have been restarted with NVQ level 5 courses. New hostel and academic complex at School of Agriculture, Pelwehera have been constructed under the Agriculture school development project. The open Training & Conference hall constructed at Kundasale under the Biodiversity fruit garden project was declared open in 2016.

In accordance with the program on 'Wasa Visa Nethi Ratak' (A country free of poisonous substances), several programs have been conducted to educate the farmers on techniques to minimize use of agrochemicals including organic cultivation techniques. Low cost toxin free local food and organic food are continuously being promoted through 'Hela bojun' sales centers while generating an additional income for the farm women involved.

I am fully confident that the Department of Agriculture will continue to be successful and carry on its award-winning traditions to enhance agricultural productivity thereby to improve livelihood of our farming communities.

I wish to sincerely thank the entire staff of the Department of Agriculture for their contribution, commitment and support towards making such remarkable progress and number of achievements. I also wish to extend a word of appreciation to the editors for their effort amidst their busy schedules and the staff of the Progress Monitoring & Evaluation Unit for their untiring effort in compiling, editing, translating and publishing the report amidst various difficulties.

Dr. R.R.A. Wijekoon
Director General of Agriculture

Highlights – 2016

New crop varieties released

Rice

Bg 252

- $2^{1}/_{2}$ month, red pericarped, short round (Samba) grain type variety.
- Average yield is 4.5 t/ha.
- Suitable for rainfed rice cultivation in areas with short season.
- The variety is non-lodging, resistant to Rice Gall midge, Rice Blast and moderately resistant to rice Brown plant hopper.

Ld 253

- White pericarped, long slender (Nadu) type variety maturing in 85 days. Average yield of the variety is about 4.5 t/ha.
- This variety has high cooking and eating qualities.
- Has high level of resistance to grain discoloration.
- The variety is non-lodging, resistant to Gall midge, Brown Plant Hopper and moderately resistant to Rice Blast.
- When the season is delayed due to drought or flood this variety can be grown as drought or flood escape variety.

Bg 374

- $3^{1}/_{2}$ month, white pericarped, long slender grain type variety.
- Average yield is 5 t/ha.
- Resistant to major pests and diseases in the country.

Maize

MI Maize Hybrid 02 (MI MZ H 02)

- A cross bred variety between CML 451 and CL 024050 introduced from Mexico.
- Average yield is about 5.5 - 6.5 t/ ha and the potential yield is about 8 t/ ha.
- This hybrid gave higher yields (about 3 - 4 t/ ha) under the drought conditions compared to the commercial hybrids.

Mung Bean

MI 7


- The average yield of the line is about 1.5 t/ha.
- Over 80% of the yield can be picked from 1st harvest.

Banana

Gannoruwa Seeni 1


- High quality ‘Seeni’ banana line selected from local collection.
- The variety is tolerant to Panama disease.

Gannoruwa Red Banana


- A local collection of ‘Rath kesel’ evaluated and tested for adaptability and identified as high yielding with quality acceptable for hotel industry and export purposes.
- Planting material production is possible through tissue culture techniques.

Pumpkin

Padma

- A starchy pumpkin line, producing about 8 fruits per vine.
- Average fruit weight varies from 700-1000g.
- Matures in 75-80 days.

Machineries Developed

4W Tractor Coupled Row Highland Seeder with Individual Working Units

- Capacity: 5 Acres / Day
- Suitable Crops: Maize, Green gram, Black gram, Cowpea, Soy bean.

Outcome of research

- The combination of organic matter amendment and mulching with inorganic fertilizer recommendation of the Department of Agriculture under sprinkler irrigation system has found to increase the green Chilli yields of hybrids up to more than 40 t/ ha while reducing the irrigation water consumption by around 50% compared to surface irrigation.


- The combination of organic matter amendment and mulching with the fertigation of inorganic fertilizer recommendation of the Department of Agriculture under the drip irrigation system has found to increase the Big Onion yield up to more than 40 t/ ha while reducing the irrigation water consumption by around 50% compared to surface irrigation.


- A mushroom bag sterilizer (boiler) was assembled and introduced for efficient and correct sterilization of mushroom growing bags.

Development Work

- Five units of high capacity solar powered water pumping systems with a water discharging rate over 60,000 l/ pump/ day were established at Field Crop Research & Development Institute - Mahailluppallama, Regional Agricultural Research & Development Centre - Aralaganwila and Grain Legume and Oil Crop Research & Development Centre - Angunakolapellessa.

- Under the Biodiversity fruit garden project, 7 million rupees were allocated for development of the Fruit Varieties Conservation Center at Kundasale. Five hectares of new fruit orchards were developed. Construction of open training & conference hall was completed. Opening ceremony was held on 14th Oct 2016.

- Infrastructure facilities of Schools of Agriculture have been improved through construction and renovation of hostels, office, libraries and academic complexes.

New Hostel – Pelwehera

Academic building complex - Pelwehera

New Hostel – Vavunia

New School of Agriculture - Paranthan

Other Activities

- Three hundred and thirteen Walk behind type Paddy Transplanters were distributed among farmers under the National Food Production Program.

- Under the Biodiversity fruit garden project, 220 pruning kits were distributed among farmers. The beneficiaries were selected from the Young Farmers' clubs, which aims to develop village level pruning team for pruning of fruit plants.

- Organic Fertilizer Production Center at Regional Agricultural Research & Development Centre, Makandura was declared open by His Excellency the President and Minister of Agriculture and initiated the National fertilizer subsidy program for distribution of money instead of fertilizer on 10th May 2016.

- Empty pesticide container collection system and recycling mechanism was established and four regional collection centers were opened in parallel to the 'Govi sathiya' held from 8th -15th October 2016, with the participation of Hon. Minister of Agriculture.


- One day workshop on mushroom was conducted at Regional Agricultural Research & Development Centre, Makandura on 21.06.2015 for mushroom growers and selected extension staff in island wide.

- A field day was conducted at Agriculture Research Station, Rahangala on 6th June 2016 with Hon. Minister of Agriculture as the Chief Guest. About 100 farmers and DOA officers participated this program.


- A workshop was conducted on 5th April 2016 at Regional Agricultural Research & Development Centre, Bandarawela to evaluate commercial Potato varieties. Farmers, representatives from Potato importing Companies and DOA officers participated this program.


Awards

- Field Crop Research & Development Institute (FCRDI)-Mahailluppalama was awarded the presidential gold medal for 'The Best Environmentally Friendly Large Scale Farm in 2016'. The FCRDI pioneered in Sri Lanka to become the first research farm with green agriculture by adopting near zero energy balance capturing solar energy and developing technologies for harmonizing the resource use in agriculture in the Dry Zone.


- Upon the implementation of productivity enhancement activities, the Department of Agriculture secured the 2nd place at national level of the Inter Departmental section at the National Productivity Awards – 2015, held by the National Productivity Secretariat, Colombo.

ABBREVIATIONS & ACRONYMS

Ac - acre
AC - Accession
ACA - *Allium cepa* accessions
ADA (E) - Assistant Director of Agriculture (Agricultural Economics)
ADA (D) - Assistant Director of Agriculture (Agricultural Development)
ADA (R) - Assistant Director of Agriculture (Agricultural Research)
ADA - Assistant Director of Agriculture
Addl. D. - Additional Director
AER - Agro Ecological Region
AFACI - Asian Food & Agriculture Cooperation Initiative
Ag. - Agricultural
Agric. - Agricultural
AI - Agriculture Instructor
AMIE - Associate Member of the Institution of Engineers
ANSOFT - Asian Network for Sustainable Organic Farming Technology
APeSC - Agricultural Pesticides Sub-committee
ASTA - Agrochemical Sales & Technical Assistant
ATIN - Agriculture Technology Information Network in Asia
AVRDC - Asian Vegetable Research and Development Centre
AWRN - Api Wawamu Rata Nagamu
B.A. - Bachelor of Arts
B.B.A. - Bachelor of Business Administration
B.Sc. - Bachelor of Science
BA - Benzyladenine
BAP - 6-Benzylaminopurine
BL - Rice Blast
BLB - Bacterial Leaf Blight
bp - Base pair
BPH - Brown plant hopper
BRS - Basel, Rotterdam & Stockholm Conventions
BSV - Banana Streak Virus
Bu - bushel
CABI - Commonwealth Agricultural Bureau International
CARE - Cooperative Assistance and Relief Everywhere
CARP - Council for Agricultural Research Policy
CCAFS - Climate Change, Agriculture & Food Security
CEC - Cation Exchange Capacity
CIP - International Potato Centre
CLS - *Circosphora* Leaf Spot
CMS - Cytoplasm Male Sterile
CNLD - Chilli Narrow Leaf Disorder Cooperation Initiative
CRI - Coconut Research Institute
CRVT - Coordinated Rice Varietal Testing
CS_2 - Carbon Disulphide
DAS - Days After Sowing
DATC - District Agricultural Training Centre
DD (D) - Deputy Director of Agriculture (Agricultural Development)
DD (R) - Deputy Director of Agriculture (Agricultural Research)
DD (R) - Deputy Director (Research)
DD - Deputy Director
DDA - Deputy Director of Agriculture
Dip. - Diploma
DL - Low Country Dry Zone

DMSO - Dimethyl sulfoxide
DOA - Department of Agriculture
DPD - Deputy Provincial Director
DRF - Dependable Rainfall
dS - deci Siemens
DUS - Distinctness, Uniformity and Stability
EC - Emulsifiable Concentrate
EMS - Ethyl Methane Sulfonate
ESCAP - Economic and Social Commission for the Asia Pacific
EU - European Union
FAO - Food and Agricultural Organization
FSV - Farmer Services Vote
FTF - Farmer Trust Fund
GA3 - Gibberellic Acid
GAP - Good Agricultural Practice
GC - Gas Chramatography
GM - Gall Midge
GNBV - Ground nut bud necrosis virus
GPS - Global Positioning System
HERP - High grade Eppawala Rock Phosphate
Hq. - Head quarters
IAA - Indole-3-acetic acid
IBA - Indole-3-butyric acid
IC - In Charge
ICP-MS - Inductively coupled plasma mass spectrometry
ICRISAT - International Crop Research Institute for Semi Arid Tropics
IIRR - Indian Institute of Rice Research
IITA - International Institute for Tropical Agriculture
IL - Low Country Intermediate Zone
IM - Mid Country Intermediate Zone
INFORM - Information for Agricultural Research Management
INGER - International Network for Genetic Evaluation of Rice
IPeSC - Industrial Pesticides Sub committee
IPM - Integrated Pest Management
IPO - Intellectual Property Office
IRFAON - International Rice Fine and Aromatic grain Observation Nursery
IRRI - International Rice Research Institute
IRSSTN - International Rice Soil Stress Tolerance Nursery
ISCAP - Implementation of Soil Conservation Act Program
ISO - International Standard Organization
ISPM - International Standards on Phytosanitary Measures
ISSR - Inter Simple Sequence Repeat
ISTA - International Seed Testing Association
ITI - Industrial Technology Institute
IU - Up Country Intermediate Zone
IW/ CPE - Irrigation Water/ Cumulative Pan Evaporation
IWMI - International Water Management Institute
JICA - Japan International Cooperation Agency
KOPIA - Korean Project on International Agriculture
KVSN - Krushikarma Vyapthi Seva Niladhari
L.L.B. - Bachelor of Laws
LCWZ - Low Country Wet Zone
LED - Light emitting diode
LOQ - Level of Quantification
LSVAT - Large Scale Varietal Adaptability Trial

M.A. - Master of Arts
M.Ec. - Master of Economics
MOA - Ministry of Agriculture
M.Sc. - Master of Science
MAI - Moisture Availability Index
mg - Milli gram
ml - Millilitre
mm - Milli meter
MMDE - Ministry of Mahaweli Development & Environment
MPET - Medium density Poly Ethylene Terephthalate
MRL - Maximum Regulatory Limit
MS medium - Murashige & Skoog medium
MS - Mass Spectrophotometry
msl - Mean sea level
mt – Metric ton
MYMV – Mung bean Yellow Mosaic Virus
MYT – Major Yield Trial
NAA - Naphthalene acetic Acid
NAITA - National Apprentice and Industrial Training Authority
NARP - National Agricultural Research Project
NBPGR - National Bureau of Plant Genetic Resources
NCB - Non Calcic Brown
NCRVT - National Coordinated Rice Varietal Trial
NCVT - National Coordinated Varietal Trial
NEAP - National Environmental Action Plan
NCHST - National Coordinated Herbicide Screening Test
NIAS - National Institute of Agrobiological Sciences
NPK - Nitrogen, Potassium and Phosphorus
NRC - National Research Council
NVQ - National Vocational Qualifications
OFC - Other Field Crops
PB - Pole bean
PCCC - Permanent Crop Clinic Committee
PCR - Polymerase Chain Reaction
PDA - Provincial Director of Agriculture
PET - Potential Evapotranspiration
PeTAC - Pesticide Technical Advisory Committee
PGPR - Plant Growth Promoting Rhizobacteria
PGR - Plant Genetic Resources
Ph.D. - Doctor of Philosophy
PHI - Pre harvest intervals
POP - Persistent Organic Pollutants
ppm - Parts per million
PTWG - Provincial Technical Working Group
PYT - Preliminary Yield Trial
QPS - Quarantine Preshipment
RA - Research Assistant
RAPD - Random Amplified Polymorphic DNA
REAP - Regional Economic Advancement Project
RGM - Rice Gall Midge
RNA - Ribonucleic Acid
RSC - Rooted Stem Cuttings
RSM - Rice Sheath Mite
RYP - Red Yellow Podzolic
SC - Suspension Concentrate
SL - Soluble liquid
SLAB - Sri Lanka Accreditation Board
SLANRMP - Sri Lanka Australia Natural Resources Management Project
SL-GAP - Sri Lankan Good Agricultural Practices

SLUSDA	-	Sri Lanka – United States Development Agency
SMS	-	Subject Matter Specialist
SOA	-	School of Agriculture
SriLanKoRDA	-	Sri Lanka – Korea Rural Development Administration
SSR	-	Simple Sequence Repeat
TOT	-	Training of Trainers
TSP	-	Triple Super Phosphate
TVEC	-	Tertiary & Vocational Education Commission
VAT	-	Variety Adaptability Trial
VRC	-	Varietal Release Committee
WL	-	Low Country Wet Zone
WM	-	Mid Country Wet Zone
WMO	-	World Meteorological Association
WP	-	Wettable powder
WU	-	Up Country Wet Zone

1.1 FIELD CROPS RESEARCH AND DEVELOPMENT INSTITUTE (FCRDI) - MAHAILLUPPALLAMA

Field Crops Research and Development Institute (FCRDI), Mahailluppallama and its satellite stations are responsible for developing varieties and other associated technologies and primary dissemination of the same to its stake holders on Other Field Crops (OFC). Crops identified as OFC in Sri Lanka are condiments (Chilli and Onions), grain legumes (Mung bean, Cowpea, Black gram), oil seeded crops (Groundnut, Soy bean, Sesame and Sunflower) and coarse grains (Maize, Finger millet, Sorghum and other millets). In addition, the institute is responsible for producing adequate quantities of nuclear seeds of its mandated crops. Further, FCRDI also caters to the enhancement of the productivity of regionally important rice and fruits and vegetables. In-situ conservation of indigenous germplasm of Dry Zone crops and utilizing them in effectively in crop improvement program and also making suitable introductions of germplasm are being done at FCRDI. To achieve all these objectives FCRDI collaborates with national and international research and development institutes, universities and private sector organizations.

FCRDI system comprises the main research station at Mahailluppallama, Grain Legumes and Oil Crops Research and Development Center (GLORDC) at Angunakolapellessa, Regional Agriculture Research and Development Centers (RARDC) at Aralaganwila and Kilinochchi, Agriculture Research Station (ARS) at Thirunelvely and Vavuniya.

BUDGET

Table 1.1.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	14,361,936	13,278,277	92
Capital	12,493,560	11,119,424	89
Projects			
• Development of hybrid varieties of Chilli, Maize and Onion	34,240,000	35,396,133	103
• NARP			
○ Mung bean	770,000	384,389	50
○ Paddy	1,233,000	1,081,901	88
○ Postgraduate research	160,000	104,100	65
○ Onion pathology	881,000	886,512	101
○ Chilli biotechnology	318,000	285,442	90

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• KOPIA			
○ Mung bean	5,160,000	1,954,126	38
○ Onion	4,540,000	2,506,036	55
• Other field crop production			
○ Chilli	6,000,000	4,300,000	72
○ Maize	500,000	401,345	80
○ Black gram/ Mung bean	1,000,000	972,435	97
○ Finger millet	1,380,000	1,158,030	84
○ Technology dissemination	1,680,000	1,681,500	100
• Crop Leader Projects			
○ Black gram	885,000	669,460	76
○ Finger millet	4,598,000	472,625	10
○ Cowpea	4,460,200	381,945	9
Total	**94,660,696**	**77,033,680**	**81**

PROGRESS

CROP IMPROVEMENT

Condiments

Chilli

Chilli is one of the major condiments in Sri Lanka. The major constraint associated with Chilli cultivation is the susceptibility of biotic (fungal diseases, viral diseases and pests) and abiotic (moisture stress) stresses. Present crop improvement program of Chilli is focused on the development of high yielding hybrids (> 35t/ha of green Chilli) and open pollinated Chilli varieties (> 20 t/ha of green Chilli yield) having resistance/ tolerance to biotic and abiotic stresses.

Chilli hybrid variety development program

- Three promising hybrids were evaluated under NCVT and one promising hybrid was selected for VAT. This promising line is moderately resistant to Chilli Leaf Curl Complex having the potential yield of 35 t/ha of green Chilli. VAT is being continued.
- Five promising hybrids with the yield potential of > 25 t/ha were selected for NCVT. Three promising inbred lines developed under hybrid breeding program were nominated for NCVT to identify promising open pollinated varieties.
- Thirty nine hybrids were evaluated under PYT and 12 hybrids were identified for MYT.
- 'Line x Tester' analysis were conducted for 52 parent lines to identify parent lines with high general combining ability for Chilli hybrid development.
- Eight parent lines with better agronomic traits were developed for Chilli hybrid development program.
- Six crosses were made using moisture stress tolerant Chilli inbred lines and 25 g of seeds from each cross were produced to develop moisture stress tolerant Chilli hybrids.

- Generation advancement of following progenies was made to develop parent lines/ inbred lines for Chilli hybrid development.

  Progenies of intra-specific Chilli hybrids advanced:

  8 progenies – (from F_7 - F_8)

  6 progenies – (from F_6 - F_7)

  11 progenies – (from F_5 - F_6)

  20 progenies – (from F_3 - F_4)

  14 progenies – (from F_2 - F_3)

  6 progenies – (from F_1 - F_2)

  Progenies of inter-specific Chilli hybrids advanced:

  11 progenies (from F_5 to F_6)

  30 progenies (from F_3 to F_4)

- Genes responsible for Genetic Male Sterile (GMS) character was transferred to 3 promising parental lines/ inbred lines through back cross breeding. Seeds extracted after third back cross were subjected to self-pollination and planted in the field to identify GMS transferred progenies.
- Variety popularization program was conducted for the local Chilli hybrid, MICH HY 1 and 15 kg of seeds were distributed among farmers.
- Thirty two exotic Chilli hybrids were evaluated for yield, pest and disease tolerance/ resistance. Six high yielding (15 -20 t/ha) hot pepper type were identified for commercial cultivation.

Chilli open pollinated variety (OPV) development program

- Sixteen parental lines were maintained for intra-specific hybridization of Chilli and 50g of seeds were produced from each.
- Ten parental lines were used for inter-specific hybridization as new genetic materials and combinations required for the breeding program.
- Fifty new intra-specific crosses (single, double and three way crosses) and ten inter-specific crosses were made by hand emasculation and pollination. Seeds were obtained for field evaluation and generation advancement.
- Following progenies were advanced through generation advancement during 2016.

Table 1.1.2: Progenies of Chilli advanced through generation advancement

Generation	Intra-specific hybridization	Inter-specific hybridization
F_1	12 crosses with 60 progenies	3 crosses with 12 progenies
F_2	30 crosses with 150 progenies	3 crosses with 6 progenies
F_3	7 crosses with 35 progenies	2 crosses with 10 progenies
F_4	13 crosses with 65 progenies	2 crosses with 4 progenies
F_5	13 crosses with 65 progenies	
F_6	10 crosses with 80 progenies	
F_7	12 crosses with 120 progenies	

Selection is done for plant architecture, yield potential, pest and disease resistance / tolerance characters to major pests (Thrips, Mites and Aphids) and diseases (fungal diseases - Anthracnose, Choanephora Blight and Chilli Leaf Curl Virus) and quality characters (colour, size, shape, appearance and pungency of the pod).

- A trial was conducted for transferring the virus tolerance character from 'MI Waraniya 1' and 'Waraniya Purple' lines to the recommended varieties.

  Following crosses and backcrosses were made.

  - Seven back crosses (1 - BC_1, 3 - BC_3F_2 and 3 - BC_2F_3) with 'Waraniya 1' were made.
  - Four back crosses with 'Waraniya Purple' (BC_1F_2) were made.

  Seeds were obtained for the next season selfing, field screening and advancement.

- Around 10,000 – 15,000 plants were maintained for the selection, evaluation and improvement of 'Waraniya Green' population. Plants with expected morphological characters were used for population improvement while removing the off types. Seeds were obtained and stored.
- Landraces are genetically diverse and represent important source of genetic diversity. Maintenance and evaluation of local Chilli landraces were carried out with population improvement of around 10,000 – 15,000 plants of Jaffna Selection and 'Hene miris' land races. Seeds were extracted from each and stored for future programs.
- PYTs and MYTs were conducted for 'Hene miris', Jaffna Selection and 'Waraniya Green' populations. Improved population of 'Hene miris' and Jaffna Selection were nominated for the NCVTs based on the results of the PYTs and the MYTs.
- Thirty eight Chilli genotypes were evaluated to assess genetic diversity of *Capsicum* species. Fourteen morphological characters were scored and analyzed using Analysis of Variance and Multivariate methods. Analysis of Variance revealed significant differences among genotypes for the most of tested traits. Pearson Correlation Coefficient showed significant positive correlation with most of the morphological traits considered. Principal Component Analysis revealed that the four components explained more than 75 % of the total variation among the genotypes. Quantitative traits such as plant breath, leaf characters, pod length, pod width, pericarp thickness, pod weight, secondary branches per plant and yield can be used to identify the breeding materials.

Onion

Onion crop improvement program was conducted to develop high yielding short duration varieties (40 t/ha by 2020) with longer storability (losses < 25 % for 4 months storage) and resistant or tolerant to major pests and diseases.

- The experiment conducted on the yield and other beneficial agronomic traits using 14 onion lines showed the yields of 3 lines were significantly higher than that of the controls. It confirmed the yields are

comparable to those obtained in Yala 2015.

- Twenty six big Onion accessions were collected from farmers' fields and evaluated their diversity to identify suitable accessions useful for the breeding program.
- NCVTs were conducted to test the adaptability of the seed setting in 3 cluster Onion lines under different climatic conditions. The line MIClO 09-01 was selected for the VATs in farmer fields based on the result of NCVTs conducted in Maha 2015/16 and Yala 2016.
- A breeding program was initiated with the purpose of developing cluster Onion variety/ies with large set size. Twenty four lines were selected from F_2 generation of the crosses between big Onion and cluster onion.
- Genetic variability related to important traits such as quality characters, tolerant/ resistant to biotic and abiotic stresses etc. in Onion is very low. Therefore, continuous germplasm exploration and crossing programs with local and exotic lines were conducted with the objective of creating genetic variability. Six F_1 generations were created and two F_2 generations were selected for further evaluation.

Coarse Grains

Maize

Maize breeding program is set to develop Maize hybrid varieties having target yield of 8 t/ha under favorable ecosystems and to develop varieties/ hybrids for moisture stressed ecosystems.

- Promising Hybrid 'CML451/ CLO2450' was released as 'MI Maize Hybrid 02'. The average yield is about 5.5 - 6.5 t/ha whereas, the potential yield is about 8 t/ ha. This particular hybrid could yield nearly 3 - 4 t/ha under drought conditions.
- Two hybrids 'CLYQ220/ CL02450Q' and 'CLYQ203/ CLYQ221' evaluated in VAT showed average yields about 5 - 6 t/ha.
- The selected 12 drought resistant Maize hybrids received from CIMMYT, India were evaluated in research and farmers' fields. Five hybrids with higher yields (6 - 7/ha) were selected for further evaluation in VAT.
- Twenty new single cross Maize hybrids developed from CIMMYT and inbred lines were evaluated for yields. Four crosses showed comparable yields (5 - 6 t/ha) with the check hybrid. The trial will be repeated to confirm the results.
- Ten promising Maize hybrids were evaluated in NCVT at 3 locations and one hybrid was comparable with the check hybrid.
- Sixty four locally developed single cross Maize hybrids were evaluated. Promising hybrids and their parental lines were selected for further evaluation and crossing programs.
- Ten exotic Maize hybrids received from different private organizations were evaluated. Maize hybrids, Champ 5555, Var 153, Tech 153 and Tech 188 Tabimdang were given permission to import for the general cultivation based on their performances.

Finger millet

The objectives of the Finger millet breeding program are to develop short age (75 - 85 days) and medium age (100 - 110 days) Finger millet varieties having a potential yield of 3.5 t/ha.

- One promising Finger millet line showing average yields of 3.0 - 3.75 t/ha was selected for VAT.
- Eight Finger millet accessions received from ICRISAT, India were evaluated with two recommended varieties in PYT. Those accessions showed average grain yields around 2.5 - 3 t/ha.
- Six promising Finger millet lines selected from a mixed population evaluated in AYT. These lines showed average grain yields of nearly 3.5 - 3.75 t/ha in both Yala and Maha seasons. One promising line was selected for NCVT.
- One bulk population of Finger millet developed through successful crosses in the previous season was established for selection.
- Seeds of two recommended Finger millet varieties were treated with four dosages of Gamma rays. Seeds of the M_1 generation of these two mutated varieties were established in the field.

Sorghum

- Two promising sorghum accessions were evaluated in VAT. These accessions showed average grain yields nearly 3.5 - 4.0 t/ha. The experiment will be repeated.

Foxtail millet

- Two promising foxtail millet accessions were tested in VAT. These accessions showed average grain yields around 2.5 - 3.0 t/ha. The experiment will be repeated.

Popcorn

- A Back cross breeding program of popcorn was initiated with the objective to develop a high yielding popcorn population. The 3rd back cross generation was established in the field.

Grain Legumes

Mung bean

Objectives of the Mung bean breeding program are to develop high yielding (> 2.5 t/ha) and pest/ disease resistant/ tolerant varieties that mature in 60 - 80 days. Synchronized maturity is another objective that is highlighted in the present program.

- Evaluation of Mung bean germplasm to identify special characters of drought tolerance, short-duration and high yielding was initiated. Accessions received from PGRC and foreign countries are being characterized, purified and multiplied to obtain sufficient seed quantities.
- Hybridization and generation advancement of Mung bean was initiated to develop high yielding varieties with desirable traits. Crosses were done using selected parents. Selection of F_2, F_3, and F_4 generations were done by the bulk selection method and from the F_5 generation upwards the single plant selection method was used.

  The progress of the evaluation -

  Maha 2015/ 16

  F_1 - 24 crosses

  F_2 - 9 crosses

F_3 - 8 crosses

F_4 - 28 crosses

F_5 - 1228 progenies from 8 crosses

F_6 - 245 progenies from 13 crosses

Yala 2016

F_1 - 10 crosses

F_2 - 23 crosses

F_3 - 9 crosses

F_4 - 28 crosses

Progenies with the desired characters were selected for the PYT.

- PYT was conducted to test the yield and other parameters of the promising lines. Nineteen lines were selected and tested in the field.
- NCVT for Mung bean promising lines were conducted to test the adaptability & stability of the promising lines in different agro-ecological regions. Two lines were selected.

Cowpea

The main objective of the Cowpea breeding program is to develop varieties having yields above 3.0 t/ ha under irrigated conditions and above 2.0 t/ha under rain fed conditions.

- Five Cowpea F_1 populations were crossed for high yields with drought tolerance. Ten F_2, five F_3 and three F_5 populations were selected and established in the field as bulk populations for generation advancement.
- Ten lines obtained from PGRC were evaluated in PYT and the evaluation will be repeated.
- Four promising lines selected from hybridization program were evaluated in NCVT. One promising line with high yield and white seed coat was identified. The trial will be repeated for the confirmation of the results.

Black gram

The objectives of the Black gram breeding program are to develop high yielding (> 2.5 t/ha) and pest/ disease resistant/ tolerant varieties.

- Hybridization & generation advancement of Black gram were done to develop high yielding varieties with desirable traits. Crosses were made using the selected parents.

Thirteen lines with the desired characters were selected for PYT.

Oil Seed Crops

Soybean

Objective of the Soybean breeding program is to develop the varieties having yields above 5 t/ha under irrigated and 3 t/ha under rain fed conditions. Other desirable traits identified are determinate growth habit, large seeds and tolerance/ resistance to pest & diseases.

- Three F_5 populations and six F_3 populations were established in the field as bulk populations for generation advancement.
- Four Soybean lines received from AVRDC were evaluated at NCVT in four locations. The NCVT will be repeated.
- Hundred and seven Soy bean germplasm received from Michigan State University were evaluated with the check varieties MISB 01 and Pb 01. The lines with higher yields and 100 seed weights were selected for PYT.
- Gamma irradiation is used to improve the qualitative and quantitative traits of soy

bean. Seeds of the variety Pb 01 were and planted in the field. Generation was advanced to M_5 level.

Vegetables

Okra

The objective of the Okra breeding program is to develop varieties having high yielding ability (> 15 t/ ha), Yellow Vein Mosaic Virus (YVMV) resistance/ tolerance and desirable fruit characters.

- Six F_4 generations of Okra were established in the field for generation advancement.

Fruits

- Establishment and maintenance of Mango, Guava, Dwarf Drumstick, Dragon fruit and Grapes germplasm was done.
- Maintained the Dry Zone Field Gene Bank to conserve genetic resources of important Dry Zone perennial crop species. Two hundred and forty plants of sixty species were established and maintained.

AGRONOMY

- Ninety nine Mung bean accessions were screened for excess soil moisture conditions at vegetative and flowering stages. Mung bean accession MIMB 1011 recorded more than 81 % plant survival with an average seed yield of 8.2 g per plant.
- A field experiment was conducted to test the impact of moisture stress at flowering period on canopy temperature, pollen and spikelet fertility of rice. Canopy temperature increased with moisture stress. Consequently, the pollen and the spikelet fertility and grain yield were affected. The trial will be continued.
- Sixteen recommended and five traditional rice varieties were screened with the objective to find out genetic and environmental variations in canopy cooling ability of rice. Water stress was imposed at reproductive stage up to "O" shaped leaf rolling in at least three varieties including the check varieties; Bg 300 and Bg 358. Variety Suwandal recorded a lower canopy cooling ability in moisture stressed condition compared to Bg 300. At 308, Bg 304, Bg 369, 'Kalu heenati' and 'Pokkali' recorded higher canopy cooling ability in no water stressed condition.
- Eleven rice varieties with different morphological characters were screened to identify phenotypic markers for reducing temperature stress on pollen sterility. Leaf temperature, spikelet temperature, culm strength and total number of grains showed higher impact on pollen sterility. Further studies will be conducted.
- A field experiment was conducted to study the impact of organic mulches on big Onion bulb production. Paddy-husk, paddy straw, partially burnt paddy husk and Glyricidia were applied as mulches at 2 weeks after transplanting. Glyricidia mulch recorded an average yield of 34 t/ ha with smaller bulb size. Paddy straw mulch recorded the highest yield (38 t/ ha) with dark coloured bulbs. No mulch condition gave the lowest average yield of 30 t/ha.
- A study was initiated to test the impact of application depth of TSP with partially burnt paddy husk on Onion. Harvested

bulbs will be used to evaluate the seed yield in Maha 2016/ 17.

- A study was conducted with the objective of studying the influence of plant growth regulators on growth and yield of Chilli. It was found that a positive interaction between plant growth regulators and Albert's solution. The trial will be continued to confirm the results.
- A study was initiated to screen the tolerance of Mung bean, Chilli and Maize genotypes on low soil moisture regimes in the dry season. Out of 40 Mung bean lines, 30 Maize lines and 16 Chilli lines, 5 Mung bean lines, 3 Maize lines and 4 Chilli parental lines performed better compared to the other tested lines under low moisture conditions. The study will be repeated.

CROP PROTECTION

Pathology

- Black mold of Onion bulbs is caused by the fungus *Aspergillus niger*. However, development of molds in Onion flower is now common in Onion growing areas. There are no chemically controlling methods for the black mold. A study was initiated to identify the causal agents of Black mold in onion flower. Big onion flower samples were collected from farmer fields with mold symptoms. Four pathogens were identified namely *Colletrotichum* spp., *Alternaria* spp., *Penicillium* spp. and *Aspergillus* spp. Among them, *Colletrotichum* spp. and *Alternaria* spp. were isolated mainly from the flowers. DNA extraction was done for molecular confirmation.
- Management of Chilli Leaf Curl Virus (CLCV) only by chemical applications is not economical and sustainable. A study was conducted to test the effect of varying micro environments under different shade levels on CLCV and pest population dynamics. The experiment was conducted with 5 shade levels; 40 %, 50 %, 60 %, 70 % and 0 % (control) using two varieties; MI Chilli Hybrid 01 and Vijaya. There were no differences in air temperature and RH among the treatments. No significant reduction of CLCV was observed with increasing artificial shade levels. The highest White fly population was recorded under 70% shade level. Mites damage increased with the increase in shade level. The Thrips infestation was low during the experimental period. Most importantly, yields reduced with the increase in shade level.
- Twelve parent lines were tested for CLCV with two check varieties. Out of 12 lines tested; MICH PL 42 showed resistant (not immune) reactions for CLCV and MICH PL 08 and MICH PL 09 showed moderately resistant reactions for CLCV.
- Four promising local Chilli hybrids were tested for CLCV with an exotic check variety. Local hybrid 1 and 2 showed moderately resistant reactions whereas, local hybrid 3 and 4 showed moderately susceptible reactions for CLCV while the exotic variety showed highly susceptible reaction.
- Two Mung bean PYT lines were screened for Mung Bean Yellow Mosaic Virus (MYMV), Anthracnose and Powdery Mildew diseases. Line No. 14-156 and 14-254 showed low infections of MYMV and

high infections of both Anthracnose and Powdery Mildew diseases.

- Eleven Finger millet lines were tested for the Finger Millet Blast disease. Out of 11 lines tested; I_{6-2} and IE 6337 lines showed comparable results with moderately resistant check variety Oshadha. The experiment will be repeated.

Entomology

- Four local Chilli hybrids were evaluated for pest damages along with the exotic hybrid 'Wijaya' under unsprayed conditions. Severity of Thrips damage was low in all the tested hybrids. However, virus incidence was high in the exotic hybrid variety Wijaya (85 %) compared to local Chilli hybrids (49 - 55 %).
- Fourteen exotic Chilli hybrids were evaluated along with the local Chilli hybrid and Galkiriyagama Selection for the pest damages under sprayed conditions. Severity of thrips damage was low (below 12 %) in all the tested Chilli hybrids during the experimental period. Mites and aphids damages were not observed. However, virus incidences ranged from 27 - 71 % in all the tested exotic hybrids whereas, that was 12 % in the local Chilli hybrid and 20 % in Galkiriyagama Selection.
- Two Mung bean lines were evaluated for pest damages along with 2 recommended varieties (MI 6 and MI 5). Results showed that all varieties were damaged by pod borers (1 - 2 %) and pod sucking bugs (27 - 38 %).
- Four insecticides were tested along with the recommended insecticide to control thrips in onion. Sulfoxaflor 24 SC/ 50 WG and Pymetroxine 50 WG were identified as effective insecticides in controlling thrips.
- Effect of intercropped Maize with different legumes to control stem borer in maize was studied. The Stem borer damage was lower in the Maize plots intercropped with Cowpea compared to Maize sole crop plots. Experiment will be repeated to confirm the results.
- Twelve exotic maize hybrids were evaluated along with the local maize hybrid for pest damages under unsprayed conditions. Stem borer damage was low (below 10 %) in all the tested exotic hybrids under unsprayed conditions.

Weed Management

- Different herbicides were tested to evaluate the weed controlling ability and phytotoxicity on Maize crop. Weeds were effectively controlled by Tembotrione 420 SC 350 ml/ha as a post emergence herbicide and Pendimathalene 33 % EC 3.5 litres/ ha as a pre emergence herbicide.

SOIL FERTILITY

- An experiment was conducted to compare the fertilizer use efficiency of Urea and Nano Urea fertilizer on growth and yield of Maize. The Nano Urea fertilizer and Urea showed similar effects on growth and yield of Maize.
- An experiment was conducted to study the effect of foliar application of Zinc Sulphate on growth and yield of green gram. Zinc Sulphate was applied at two weeks after planting and at the flower initiation stage. Available soil Zinc level

was low. Results reveal that the foliar application of Zinc Sulphate has a positive impact on the yield of green gram.

WATER MANAGEMENT

- Study was performed to modify the traditional alley cropping system with increased spacing between two alleys and incorporation of micro irrigation system to provide supplementary irrigation. Result revealed that the alley cropping systems with sprinkler irrigation and lopping increased seed yield of green gram by 38 - 45 % while alley with sprinkler irrigation without lopping increased yield by 25 - 26 % compared to the non alley with sprinkler irrigation. It was found that the average temperature could be reduced by 1^0-1.5°C with alley and sprinkler irrigation without lopping. The experiment will be continued.
- A series of experiments was initiated in 2015 and continued in 2016 to develop the best agronomic management packages for Chilli, Onion and Mung bean based on micro irrigation systems. Mulching with paddy straw, amendment of organic manure, split application of fertilizer were applied as packages under the drip and sprinkler irrigation systems. Fertigation was also practiced with drip irrigation. Study showed that the combinations or the packages can be used to increase the productivity of Big onion, green Chilli and Mung bean yields up to 40 t/ha, 45 t/ha and 2.5 t/ha respectively under the micro irrigation systems while reducing the irrigation water consumption by around 30 - 50 %. Some of the experiments will be repeated to verify and confirm the results.

BIOTECHNOLOGY

- A study was initiated to evaluate Chilli accessions along with the recommended varieties to detect anthracnose resistance.

  Jaffna Local and Waraniya varieties were highly susceptible while CAH36, ICPN, MICH3 and PBC 380 showed the susceptible reaction. 'Galkiriyagama' Selection, 'Hen miris', 'Kochchi-1, Kochchi-2, KA 2, MI 2, MI Green, MICH 3 , Jaffna Selection, Waraniya Purple, 987.3 and Chilli Thai (commercial variety) showed moderately susceptible reaction. Arunalu and MI Hot showed the lowest susceptible reaction.
- A tissue culture protocol for regeneration of Tobacco was generated. A method for inhibiting the recalcitrant nature of Chilli was tested and successful results were obtained. Further, the methods are being tested for the tissue culture regeneration of Chilli.
- A study was carried out to finger print 18 Chilli accessions using six Simple Sequence Repeat (SSR) primers. Data showed that 'Hen miris', MICH 3, ICPN-18-7 line, Arunalu, MI 2 and MI Green grouped in one cluster. Waraniya Purple, Hot Beauty, Purple 'Nai Miris' (*C. chinense*) and Acc. No. 11642 (*C. frutescent*) can be grouped into another. The most distant phylogenetic relationship (2.3541) was observed between Hot Beauty and MICH 3 while the lowest genetic distance (0.1406) was observed with Arunalu and MI2. Hot Beauty, MICH 3 and Waraniya Purple can be used as genetically diversed parents. The primer set M1 (JS 108 F and JS 109 R primers)

can be recommended to obtain the highest Polymorphic Information Content (PIC).

- Incorporation of the Opaque -2- gene into non QPM lines is desired to convert QPM line/ variety to develop QPM varieties. Selected two lines of (CML 20/ 193, 164/ CML 20) population were advanced to BC_2F_2 population after selfing. Molecular screening of 210 plants of CML 20/ 193 cross combination, 30 QPM incorporated 30 lines were identified. Three lines were advanced to BC_2F_3 population by selfing and back crossed with CML20 to form BC_3F_1. Population of BC_3F_1 were advanced to BC_3F_2 & BC_3F_3 Crosse combination of 164/CML 20 were advanced to form BC_3F_4. The study is in progress.
- Grape vine (*Vitis vinifera* L.) is one of the most important fruit crops growing in Sri Lanka. An experiment was initiated to develop a micro propagation protocol for important grape varieties available in Sri Lanka. C2D medium with 0.5 mg/ l BAP was identified as the culture initiation medium and C2D medium with 5µM BAP and GA_3 0.2 mg/l was identified for the shoot multiplication. The protocol was developed for Sonaca seedless grape variety and the *in vitro* multiplication was initiated.
- A study was initiated to screen Mung bean lines/ varieties with bruchid resistant gene (Br_1). Genomic DNA was extracted. Protocol was developed to screen the Mung bean lines/ varieties with bruchid resistance gene (B_{r1}).

SEED PRODUCTION

Breeder and Certified/ Commercial Seed Production

Following quantities of breeder and certified/ commercial seeds were produced and supplied to SPMDC and other relevant organizations (Table 1.1.3).

Table 1.1.3: Quantities of breeder and certified/ commercial seeds produced during 2016

Crop	Variety	Breeder seed production (kg)	Registered/ Certified/ Commercial seed production (kg)
Maize	Ruwan	14.0	-
	Bhadra	35.0	-
	CML 161	285.0	-
	CML 194	301.0	-
	MI Maize HY 1	-	490.0
Finger millet	Rawana	37.0	-
	Oshada	60.0	-
Popcorn	MI pop corn	55.0	-

Crop	Variety	Breeder seed production (kg)	Registered/ Certified/ Commercial seed production (kg)
Chilli	Galkiriyagama inbred line	2.17	-
	MI Waraniya 1 inbred line	0.45	-
Mung bean	Ari	17.0	-
	MI 5	15.0	-
	MI 6	45.0	-
Big onion	MIBO 1	20.0 (True seeds)	-
	MIBO 1	300 (Nuclear mother bulbs)	
	Dambulla Selection	340 (Nuclear mother bulbs)	254 (Commercial mother bulbs)
Black gram	MI 1	20.0	-
	Anuradha	22.0	-
Soybean	Pb 01	96.0	505.0
	MISB 01	62.0	-
Cowpea	Dhawala	25.0	-
	MI 35	05.0	-
	Waruni	22.0	-
	Bombay	20.0	-
Snake gourd	MI short	2.0	-
Vegetable Cowpea	BS 01	64.0	-
Vegetable Cowpea	Bushitavo Local	34.0	-

TECHNOLOGY DISSEMINATION

- FAO declared the year 2016 as 'The Year of Pulses'. FCRDI organized a symposium on 'Legumes for a Healthy Nation' on 15th December, 2016. It covered almost all the key aspects from the seed to the diet. Over 180 officers were participated at the symposium.
- A 'Field Week' program was organized to increase the awareness of ongoing research and development activities on other field crop production at FCRDI, Mahailluppallama from 26th to 29th July, 2016 with the participation of over 600 farmers, officers, university students and school children.
- FCRDI scientists participated in various programs as resource personnel;

- Over 150 training programs were conducted on Other Field Crops (OFC) production for officers, farmers and for school, university and technical college students with a total number of participants over 4200.
- Over 90 field visits and 4 Plant Clinics with the Agriculture Extension staff

- Technical advices were provided for over 2250 clients.
- About 300 of leaflets on technical information were distributed.
- Five hundred and seventy soil samples were tested and recommendations were provided.
- Planting materials were issued free for farmers and other institutes as follows.
  Seed material: 54 kg of OFC seeds

Trainings

- Three Undergraduate students completed the final year research project at the institute.
- In-plant trainings:
- Sixteen Technical College students completed their 6 months in-plant training at the institute. Further, 1 District Training Institute Officer, 22 National Youth Service Council students and 9 School of Agriculture students completed 6 months in- plant training at the institute.

TV/ Radio Programs

- Sixteen radio programs on OFC cultivation.
- Two TV programs on OFC cultivation.

DEVELOPMENT

- The following infrastructure development activities were carried out under the Hybrid Development project.
  - Upgrading of existing laboratories for smooth functioning of research activities.
  - Establishment of a solar panel system with the capacity of 12 kW was established to generate electricity and supply to the National Electricity Grid.
  - Establishment of irrigation facilities by introducing rain gun irrigation systems and 3 high capacity (> 60 000 L/ day/ pump) solar powered water pumping systems.
  - Purchasing of laboratory equipment for smooth functioning of research activities.
  - Establishment of a 10 acre new research field with the irrigation facilities and fencing.
  - Establishment of a Cyber Communication system to facilitate rapid and effective communication network.
- Four large scale rain shelters were constructed utilizing the funds from different projects to conduct research under rain protected condition.
- Under the KOPIA project on Seed multiplication and cropping technology development of big Onion varieties for Sri Lanka, two onion store houses were constructed in Galenbindunuwewa onion seed production model village and one store house at Hambantota onion seed production model village to store mother bulbs. Forty three tons of onion bulbs

were produced in Galenbindunuwewa model village. Ten tons of mother bulbs were vernalized and 2.5 t were stored. The rest of 30 t were sold and earned Rs. 1.65 million.

A soil improvement program was carried out as poor soil properties observed in rain shelters in the onion seed production model villages. Cattle manure and rice husk were incorporated into the soil and solarized to sterilize the soil for 45 days. Afterwards, Mae crop was grown as a legume to improve the soil fertility. The harvest of Mae crop produced an additional income of about Rs. 60,000 per farmer within two months period.

SPECIAL AWARDS

- FCRDI - Mahailluppallama was awarded the Presidential gold medal for 'The Best Environmentally Friendly Large Scale Farm in 2016'. The FCRDI pioneered in Sri Lanka to become the first research farm with green agriculture by adopting near zero energy balance capturing solar energy and developing technologies for harmonizing the resource use in agriculture in the Dry Zone.

PLAN FOR 2017

Research

- Crop improvement and variety development of other field crops
- Development of technologies to control pest and diseases in other field crops
- Effective utilization of biotechnology tools in crop improvement
- Development of soil management technologies for other field crops
- Development of techniques to enhance the water productivity in the dry zone
- Conducting studies on climate change on productivity of other field crops
- Development and identification of fitting vegetable and fruit crops/ varieties for the Dry Zone

Development

- Production of breeder seeds of the recommended other field crop varieties.
- Dissemination of agriculture technology to stakeholders.

STAFF LIST

Designation	No. Existing
Director	01
Additional Director	01
Assistant Director of Agriculture (Agric. Research)	21
Assistant Director of Agriculture (Agric. Development)	01
Assistant Director of Agriculture (Agric. Economics)	01
Program Assistant (Agriculture)	02
Agriculture Instructor	05

Designation	No. Existing
Research Assistant	24
Public Management Assistant	15
Technological Assistant	03
Driver	08
Tractor Operator	02
Storeman	01
Lorry Cleaner	01
Mechanic	03
Technician	01
Research Sub Assistant	08
Circuit Bungalow Keeper	02
Office Employee	01
Watcher	28
Laborer (Permanent)	273
Laborer (Contract)	23
Total	**425**

1.1.1. GRAIN LEGUMES AND OIL CROPS RESEARCH AND DEVELOPMENT CENTRE (GLORDC) - ANGUNAKOLAPELESSA

Grain Legumes and Oil seed Crops Research and Development Centre comes under the preview of FCRDI is the main agriculture research centre located in Southern Dry Zone. It is mainly focusing on the research and development programmes of grain legumes, oil seed crops, regionally important vegetable and fruit crops. It also involves with transfer of technology along with its satellite station at Weerawila in DL_5 agro-ecological region. All the research programs are planned based on both national and regional research needs in the thematic areas of crop improvement, agronomy, plant protection, water management and soil science.

In addition, the Centre involves with the production of breeder seeds and basic planting materials of released varieties, recommendations on site specific fertilizer application and dissemination of technical information to field officers, farmers and other interested people.

BUDGET

Table 1.1.1.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	13,009,211	11,465,392	88
Capital	4,819,250	4,489,348	93
Projects (NARP)			
• NARP			
• Detection and management of virus like diseases in Cucurbits, Legumes and Chilli in the Southern Dry Zone	223,700	180,775	81
• Determination of critical crop – weed competitive period and the effect of weeds on yield of Groundnut	240,000	205,409	86
• Post graduate research work (M.Phil.) under MOU with NARP	281,000	269,382	96
• Collection, establishment and evaluation of Wood apple germplasm from Dry and Intermediate Zones	1,496,900	1,376,481	92
• Fruit village program			
• Citrus diversity collection and evaluation	1,200,000	1,161,381	97
• Establishment of Mango orchard	700,000	699,872	100
• Production of 10,000 grafted Wood apple plants	870,235	870,235	100
• 100 million project	6,310,000	5,792,722	92
Total	**29,150,296**	**26,510,997**	**91**

PROGRESS

RESEARCH

AGRONOMY

- Conducted a trial to evaluate the effect of Abscisic acid and drought stress on Groundnut (*Arachis hypogea* L.) revealed that the per plant seed weight and filling percentage was not significantly different with the drought effect in the treatments of seed soaking with Abscisic acid and foliar application of Abscisic acid compared with the control.
- A trial conducted on application of different techniques to improve quality parameters of indeterminate Sesame revealed that 0.5 moldm^{-3} salt application was the effective treatment for defoliation of Sesame before harvesting.
- In a trial on evaluation of intercropping systems of Maize with legumes, Maize yield was not significantly different with the treatments of sole crop Maize and Maize intercropped with Soybean, 'Kollu' and Groundnut separately.
- Conducted a trial for drought screening of CYMMIT lines of Maize and data collected have been forwarded to the trial coordinator for further analysis.
- Conducted farmer field trials with the focus of developing a technological package of practices for sustainability of Finger millet cultivation under rainfed farming systems. Tested the effects of row sowing, compost application and application of recommended dosage of inorganic fertilizers on yield. Research is ongoing.
- NCVT Trials were conducted on Groundnut, Sesame, Mung bean, Cowpea, hybrid Chilli, hybrid Maize, Soy bean and Finger millet. Collected data were forwarded to the relevant coordinators for further analysis.
- Conducted VAT trials of Groundnut, Sesame, Cowpea, Chilli, Sorghum, Finger millet, Foxtail millet and hybrid Maize in Hambantota district.

PLANT BREEDING (CROP IMPROVEMENT)

Oil Seed Crops

Groundnut

Development of high yielding, medium duration, large seeded Groundnut varieties

- Three promising large seeded lines (ANKGLS 02, ANKGLS 03, and ANKGLS 07) were tested in national coordinated variety testing (NCVT).
- Three promising short duration (3 months) lines (ANK 2014/01/14, ANKGL 6 and ICGV 2742) selected from F_5 generation were advanced to NCVT.

Sesame

- Conducted Research trials to develop high yielding, high oil content, and disease tolerant determinate type white / black seeded Sesame varieties. Under this program hybridized F_4 generation was advanced.
- Eight sesame lines were evaluated in NCVT and selected 3 lines to evaluate in VAT.

- Carried out a purification program for variety MI 3. The variety is purified about 40%.

Soybean

- Two selected promising lines (AC 2133, AC 2514) are being tested in NCVT.
- Four promising lines were selected from mutated Soybean lines and advanced in to yield trials.

Grain Legumes

Mung bean

- Generation advancement of F_3, F_4 & F_6 were carried out to develop high yielding (>3t/ ha), pest and disease tolerant Mung bean varieties for seasonal cultivation.
- Generation advancement of F_5 was carried out to develop high yielding (2 t/ ha), pest and disease tolerant Mung bean varieties for catch cropping and MB 48 line was selected for further evaluation in NCVT.
- Completed MYT and new 3 Mung bean lines were nominated for the NCVT.

Cowpea

- CP 220 & CP 128 Cowpea lines were identified as comparatively high drought tolerant accessions are being further tested in NCVT.
- CP 32, CP 158 Cowpea lines are being further tested in VAT.
- ANKCH 1 was identified as high yielding medium duration Cowpea line is being tested further under VAT.
- Conducted of Major Yield Trial for medium duration 4 lines, short duration 5 lines and drought tolerant 6 lines.

Vegetables

Thumba

- Sixty four germplasms were maintained successfully as a field gene bank.

Ela batu

- Selected five promising lines with desirable fruit quality characteristics are being forwarded for NCVT.

Okra

- Developed two Okra lines with virus tolerance are being further evaluating in NCVT.

Big Onion

- Development of germplasm variability through mutation with gamma radiation was carried out to increase big onion germplasm variability, M2 generation was advanced.

Red Onion

- Development of large size bulb, early maturity (< 75 days) cluster onion line through conventional breeding. Selected two lines were purified for further yield evaluation.

Fruit Crops

Wood apple

- Maintained the established 68 accessions of Wood apple gene bank with extent of 25 acres.
- Established 81 new accessions.

- Sixty four accessions were produced flowers and fruits. Flowering and fruiting data were recorded.
- Started the characterization of fruits, basic characters recorded and analyzed.

Beli

- Maintained the successfully established 20 accessions of 'Beli' gene bank with an extent of 1.5 acre.
- Established 10 new accessions.

Mango

- After rejuvenation of Mango older plantation, survived trees produced canopy but flowering was not observed in 2 seasons. Several trees died due to lack of nutrients.
- Studied the outer canopy ball pruning and high density planting of Mango. Two ball pruning cycles were completed and trees have developed with desirable canopy structure. Flowering and fruiting recorded.

Banana

- Evaluation of yield characters completed for 4 seasons. One 'Embul' banana accession and one 'Seeni kesel' accession were selected and further studies for varietal development are planned.

Citrus

- There were 257 accessions collected and established including Orange, sour Orange, 'Heen naaran', 'Jambola', 'Gada dehi', 'Nas naaran', Mandarin and 'Sidaran'.
- Mother plants characterization completed.

Papaya

- Established and evaluated local Papaya hybrids in NCVT.
- Ten Papaya Ring Spot Virus (PRSV) disease tolerant Papaya lines with good quality and quantity yield characteristics were identified from varietal development program.

Grapes

- Sensory studies and planting material production were completed (400 plantlets) from selected 'Sharad' seedless grape accession.

SOIL SCIENCE

- Optimized the efficiency of pyrolysis of Rice husk by using 'Kunthaniya' in farmer useable level. Observed fire wood consumption of the optimized pyrolyzer was 0.1±0.04 kg/ kg of Biochar and the yield obtained was 47.9± 1.1(%) Biochar with 25.06±2.17 (%) fixed carbon on dry basis.
- Innovated and optimized a method for pyrolysis of corn cobs in farmer usable level. Observed fire wood consumption was 6.82±0.64 kg/ kg of Biochar and obtained yield was 32.63± 1.69(%) Biochar with 39.08±0.05 (%) fixed carbon on dry basis.
- Conducted research trials to test eight imported fertilizer mixtures in pot level and five fertilizer mixtures in field level for Maize in DL_{1b} ecological region. Pot level & field level evaluatons were completed and results were sumited to Fertilizer Testing Committee.

FOOD SCIENCE

- Analysis of medium and large seeded Groundnut genotypes for their physical, proximate and chemical properties was completed. As physical properties, Pod shape is *hypogea*. Proximate compositions of both types are compatible. Crude protein (18-28%) and crude fat (43-52%) are major components. All genotypes contained more than 70% of unsaturated fatty acid in which monounsaturated fatty acid (Oleic acid) was the prominent.
- Development of ready to serve Banana product development was completed. It can be stored for 3 months without any chemical changes of the product.
- Better Banana chips/ snack can be produced by using 'Embul' banana compared to 'Seeni' banana. 'Embul' banana chips showed good colour, smell, taste and overall acceptability.
- Physical and proximate composition of sesame varieties and lines were evaluated. Crude protein (14-24%) and crude fat (36-47%) contained as the major food components.
- Flour extraction from 'Embul' banana is completed, product development of Banana biscuit is progressing.

PATHOLOGY

- Thirty five Mung bean accessions, were screened for bud necrosis disease. Among the tested Mung bean lines there were no resistant/ tolerant lines. Nine lines showed moderate resistance.
- Under *In vitro* mutagenesis of Banana for Fusarium wilt (*Fusarium oxysporium* f.sp. cubense (Foc)) resistance/ tolerance, 2,726 tissue culture-derived plantlets were screened under double tray technique and 1,845 plantlets were screened under sick plot. No resistance/ tolerance plant was identified.
- In the program for detection of virus and virus like diseases in Cucurbits, legumes and Chilli in the Southern Dry Zone two new virus diseases were identified in Cucurbits.

WEED SCIENCE

- A survey was conducted to compile a inventory of upland weeds in Southern Dry Zone. Thirty two grass species, 9 sedge species and 217 broad leaved weed species were identified from 70 locations surveyed.

ARS, WEERAWILA (DL_5)

Big onion and Red onion

- The planting time study conducted in late Maha the most suitable planting time was observed as between January and February for the off season cultivation of big Onion. Obtained yield was >30 tons/ha.
- Artificial pollination is found as not necessary under open field condition for big Onion seed production.

TECHNOLOGY TRANSFER AND TRAINING

TV programs

- Mr. D. Weerasekara participated for 4 audio visual programs on multiplication, maintenance and problems of Spine gourd cultivation.

Radio programs

- Conducted Radio programs on released legume varieties at 'Ruhunu Gewaththa' on 'Ruhunu sevaya' and 'Swedeshiya sewaya'.
- Three radio programs on vegetable cultivation. at 'Ruhunu Gewaththa' on 'Ruhunu sevaya'.

Training programs

- Twenty two pre-seasonal training programs were conducted for technical officers in agriculture extension service in Southern province.
- Conducted a pre seasonal training program on Grain legume cultivation in fallow/ neglected paddy lands for the Extension officers in Gampaha district.
- Conducted three plant doctors training programs in Matara, Galle and Hambantota districts.
- Conducted training for new Technical staff members on Establishment and management of pulse crops.
- One seminar program was conducted on Fruit quality improvement for field level officers.

Services provided

Soil and commercial compost testing program

- 1,330 soil samples from farmer fields were analyzed and fertilizer recommendations were provided.
- 68 diseased sample inspections and providing necessary recommendations were done.

PLANTING MATERIAL PRODUCTION

Vegetables

- 4,000 plantlets were produced as basic planting materials of recommended 'Thumba' varieties.

Seed Production

Table 1.1.1.2: Amount of seeds produced during 2016

Crop	Variety	Type	Quantity (kg)
Groundnut	Indi	Breeder's seed	63
		Multiplication	66
	Thissa	Breeder's seed	261
		Multiplication	154
	ANKG 1	Breeder's seed	84
		Multiplication	94
	ANKG 2	Breeder's seed	147
		Multiplication	253
	Walawa	Consumption	5.5
	Mixed Groundnut	Consumption	556

Crop	Variety	Type	Quantity (kg)
Sesame	Uma	Breeder's seed	12
	Malee	Breeder's seed	2.8
	ANKWS6	Multiplication	13
	MI-1	Multiplication	04
	MI-3	Multiplication	187
	Mixed Sesame	Consumption	140
Cowpea	ANKCP 1	Breeder's seed	25
	ANKCP 1	Commercial seeds	125
	Mixed Cowpea	Consumption	540
Horse gram	ANKK Black	Breeder's seed	06
	ANKK Brown	Breeder's seed	06
	Mixed Horse gram	Consumption	160
Mung bean	ANKMB48	Multiplication	33
	MI- 6	Multiplication	29
	MI- 5	Multiplication	05
	Mixed Mung bean	Consumption	39
Finger millet	Rawana	Multiplication	20
	Mixed Finger millet	Consumption	13.5
Maize	Mixed Maize	Consumption	142
Ruhunu miris	Tested seeds	Multiplication	03

DEVELOPMENT ACTIVITIES

Infrastructure facilities of the GLORDC was improved by establishing 30 acre fruit gene bank, building a field nursery house and a cold store for seeds and improved the facilities of irrigation with extended irrigation for 50 acre orchard. Tissue culture laboratory and net house were renovated.

PLAN FOR 2017

- Development of crop management practices for field crops.
- Development of high yielding, medium duration, large seeded Groundnut varieties for industrial and general consumption purposes.
- Development and Improvement of Sesame varieties for industrial and consumption purposes.
- Development and Improvement of other oil
- seed crops.
- Soil fertility management studies with special reference to oil seed crops and pulses.
- Development of environmentally friendly and cost effective pest and disease management methods for oil seed crops and pulses.
- Development of economical and consumer preferred food processing techniques for oil seed crops, pulses, regionally important fruits and Maize.

- Identify the best fruit crop management package for the Southern region.
- Development and Improvement of regionally important vegetable crops.
- Development and Improvement of grain legume crops with special reference to Mung bean, Cowpea and Horse gram for high yield, quality and pest & disease resistance.

STAFF LIST

GLORDC, Angunakolapelessa

Designation	No. Existing
Additional Director	01
Deputy Director of Agriculture (Agric. Research)	01
Assistant Director of Agriculture (Agric. Research)	14
Assistant Director of Agriculture (Agric. Economics)	01
Administrative Officer	01
Economist Assistant	01
Development Officer	03
Farm Manager	01
Agriculture Instructor	01
Research Assistant	13
Public Management Assistant	06
Technological Assistant	02
Driver	07
Tractor Operator	02
Circuit Bungalow Keeper	01
Office Employee	01
Watcher	15
Laborer (Permanent)	159
Laborer (Contract)	22
Total	**252**

Agriculture Research Station, Weerawila

Designation	No. Existing
Assistant Director of Agriculture (Agric. Research) In Charge	01
Development Officer	01
Research Assistant	02
Driver	01
Tractor Operator	01
Watcher	04
Laborer (Permanent)	13
Laborer (Contract)	04
Total	**27**

1.1.2 REGIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT CENTRE (RARDC) - ARALAGANWILA

Regional Agricultural Research and Development Center (RARDC), Aralaganwila coming under the purview of Field Crop Research and Development Centre is undertaking demand driven research on other field crops and regionally mandated crops such as rice, fruits and vegetables. Research programs of the Centre are focused on developing high yielding varieties, crop protection techniques, agronomic practices and plant nutrition management strategies.

RARDC, Aralaganwila is the only agricultural research station established to work on Non Calcic Brown soil group in DL_{2b} agro ecological region. This is the research station that covers the agricultural technology needs of the Eastern region of Sri Lanka in addition to Mahaweli systems B, C & G.

BUDGET

Table 1.1.2.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	7,588,900	6,257,578	82
Capital	3,817,450	3,766,371	99
Projects			
• Papaya breeder seed production	540,000 (Excluding Rs. allocation of 660,000 for labor payment)	379,955	70
• Development of hybrids and OPVs of Chilli, Maize and Onion			
Capital	8,000,000	8,410,591	105
Recurrent	2,077,400	2,077,398	100
Total	**22,023,750**	**20,891,893**	**95**

PROGRESS

Varietal improvement

Cluster onion

- The morphological & quality characters of 60 accessions were continued. Five short duration accessions (60 -75 days) were evaluated. ACA 56 (10.9 t/ha) and ACA 13 (10.6 t/ha) in Maha season and ACA 56 (17.5 t/ha), ACA 13 (13 t/ha) in Yala season gave the highest yield having the best adaptability compared to lines Jaffna Local (7.5 t/ha, 12.3 t/ha) and Thinnavely Red (10.6 t/ha, 17.1 t/ha). ACA 56 and ACA 13 were selected for Varietal Adaptability Trial. After evaluation of 22

bolting type (>5% bolting) accessions under Major Yield Trial (MYT), ACA 67, ACA 68 , ACA 81 (line number 15) & ACA 82 (line number 17) were selected with 'Vethalan' (check) for NCVT. ACA 19 was tested under MYT (high pungent). ACA 66 was being tested testing under DUST.

- Hybridization of Cluster Onion was done with selected lines & some wild lines. F_1 seeds were extracted for generation advancement.

Horticultural crops

Mango

- Evaluation of available Mango germplasm was carried out, by collecting quantitative and qualitative yield data of forty-six mango accessions. Among those ACC 07, 61, 28, 40 and 34 showed >200 g average fruit weight and ACC 51, 22, 28, 39 and 40 showed >21 Brix value. Data collection will be continued.
- Flowering and shoot development behavior of the 'Karathakolomban' and 'Velleikolomban' mango varieties was studied. In 'Karathakolomban', maximum 33 % of shoot initiation and 20 % of flower initiation were observed in April 2016 and February 2016 respectively. In 'Velleikolomban', maximum 28 % of shoot initiation and 20% of flower initiation were observed in May 2016 and April 2016.

Papaya

- Effect of seasonal variation and crossing method on seed formation of 'Ratna' papaya was studied. There is no effect on pollination method for seed and fruit formation.
- A new 'Ratna' papaya breeder seed field was established. Field is in flowering stage and flowers were covered for self-pollination.

Dragon fruit

- Plant training and pruning are very important practices in fruit cultivation to obtain good yield. An experiment was commenced to evaluate different training and pruning methods in dragon fruit. Plants were pruned following the treatments. Trial will be continued.

Agronomy

Cluster onion

- Level of pungency and prolong storage are key characters to select Cluster onion varieties for cultivation. An experiment conducted showed that the application of Sulphur could not improve either pungency or the storability of Cluster onion.
- Different levels of nitrogen fertilizer and time of planting were evaluated for the bolting of non-vernalized cluster onion. But none of the plants were flowered. Trial will be repeated with different planting materials.

Rice

- Three lines of 4 ½ months maturity classes, three lines of 3 ½ months maturity classes, five lines of 3 months maturity classes and five lines of 2 ½ months maturity classes were tested at Aralaganwila. From these, check line BG

403 (8.3 t/ha) in Maha season of 4 ½ months maturity class gave the highest yield. AERON 10-25 (4.42 t/ha) of 3 ½ months maturity class (Low moisture stress tolerant) gave the highest yield in Maha season and check variety Bg 352 (6.7 t/ha) showed the highest yield in Yala season. In 3 ½ months maturity class check line Bg 366 (9.3 t/ha) gave the highest yield in Yala season. At 10-1374 (6.4 t/ha) of 3 months maturity class gave the highest yield in Maha season and check variety At 309 (10.1t/ha) was the best in Yala season. BG 10-2881 (5.52 t/ha) and AGT 17 (5.15 t/ha) gave the highest yields in Maha season from 2 ½ months maturity class.

Cowpea

- Four Cowpea (drought tolerant) lines were evaluated and ANKCP 1(1.8 t/ha) gave the highest yield in Yala season. Six lines of Cowpea were tested under NCVT in Maha season and ANKCH 1 (2.3 t/ha) gave the highest yield.

Mung bean

- Six Mung bean lines were tested under NCVT. No significant difference in yields was observed in both seasons.

Groundnut

- Five lines of large seeded groundnut were tested under NCVT. ANKG 3 (0.9 t/ha) gave the highest yield in Maha season and ANKG 7 (3.5t/ha) gave the highest yield in Yala season.

Sesame

- Nine lines of sesame were tested. ANKBS 02 (0.9 t/ha) gave the highest yield in Maha season and crop was not succeed in Yala season.

Underutilized crops

Thibbatu

- Application of 1.9 ml/10l of Chlorantraniliprole (Korajen) with monthly interval was effective in the management of hard wood stem borer in Thibbatu.

Spine gourd

- Planting material production was done using selected quality local line/ varieties and hybrid lines.
- Technology of planting materials production was transferred to farmers in Mahaweli area to fulfill the planting material requirements.
- Different flowering patterns of the female and male hybrid vines have been identified.

Plant Protection

- Purple blotch, Anthracnose and Fungal bulb rot are the major fungal diseases of Cluster onion. 46 Cluster onion lines were screened for these diseases and selected lines were multiplied.
- Leaf eating caterpillars, Thrips, Bulb mites are the major pests and Purple blotch, Anthracnose, Fungal bulb rot, Bacterial bulb rot, Downey mildew are the major diseases of onion cultivation in Sri Lanka. Crop damage from above pests and diseases varies with different climatic conditions. Data analysis is being done to

develop a cropping calendar for Mahaweli system B.

- Major pests of groundnut are red hairy caterpillar, Army worm, Aphid, Thrips and Termites. Groundnut bud necrosis, Foot rot, Early blight, Late blight are the major diseases in Groundnut cultivation. Data collection is on progress to develop a cropping calendar for Mahaweli system B.

Soil Science & Water Management

- Long term studies were conducted since 1992 to show the impact of combined application of organic and chemical fertilizers for paddy. In the study of Rice-legume rotation, green manure with chemical fertilizer application gave the highest yields (4.7 t/ha). In rice-rice rotation, green manure and chemical fertilizer application showed a more favorable impact compared to other treatments in long term (Yield > 6 t/ha).
- A study is continuing to assess the impact of climate change on Maize production in Sri Lanka: Using the previous experimental data model calibration was completed for different varieties.
- Thirty nine paddy varieties were screened for low fertility conditions in Non-calcic Brown soil. Bg 357 and Bg 358 varieties recorded the highest yields (>4 t/ha) without applying fertilizer. This study will be continued.

Services

- **Soil testing:** Analyzed 557 soil samples from farmer fields and soil test based recommendations were provided.
- Farmer advices were given for more than 63 farmers and 28 field visits on plant protection problems.

Seed and planting material production

Table 1.1.2.2: Seed and planting material production in 2016

Crop	Variety	Seed / material production
Spine gourd	Local/ hybrid	Distributed 2,573 potted vines
Thibbatu	Bindu	Distributed 70g of seeds and 319 potted plants for farmers

PLAN FOR 2017

- Varietal improvement of cluster onion for pest and disease resistant
- Development of appropriate agronomic crop management practices for Cluster onion.
- NCVTs for Mung bean, Cowpea, Groundnut and Soy bean coordinated by FCRDI, GLORDC & RARDC, Kilinochchi.
- CRVT for rice (2 ½ months, 3 months, 3 ½ months, 4 months) coordinated by RRDI.
- Development of suitable crop management practices for regionally important fruits and vegetables.
- Studies the population dynamics of pests and diseases of Groundnut.
- Climate change impacts on maize production in Sri Lanka : A crop model approach (continuing research)

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director of Agriculture (Research)	09	04
Administrative officer	01	01
Agriculture Instructor	04	02
Research Assistant	09	04
Public Management Assistant	05	05
Technological Assistant	04	07
Driver	05	04
Tractor Operator	02	01
Store Keeper	01	01
Electrician	01	01
Technician	01	01
Carpenter	01	01
Blacksmith	01	-
Research Sub Assistant	09	03
Budder	01	02
Circuit Bungalow Keeper	01	01
Watcher	13	11
Laborer (Permanent)	85	79
Laborer (Contract)	-	15
Total	**153**	**144**

1.1.3 REGIONAL AGRICULTURE RESEARCH AND DEVELOPMENT CENTRE (RARDC) - KILINOCHCHI

The mandate of the Regional Agriculture Research and Development Centre, Kilinochchi including its satellite stations located at Vavuniya, Thirunelvely and Mullaitivu (re-establishing) is to conduct agricultural research and development activities especially on other field crops for the Northern region, to cater to the needs of farmers in that region. RARDC, Kilinochchi is affiliated to the FCRDI, Maha lluppallama.

BUDGET

Table 1.1.3.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	10,821,777	10,090,747	93
Capital	1,875,700	1,863,020	99
Projects			
• Hybrid			
• Recurrent	1,220,100	1,467,578	120
• Capital	2,834,163	2,689,740	95
• NARP	1,281,900	1,273,807	99
• UNDP	1,000,000	1,000,000	100
• Iranaimadu Irrigation Development Project (IIDP)	779,420	577,974	74
• FAO	462,000	165,721	36
Total	**20,275,060**	**19,128,587**	**94**

PROGRESS

RESEARCH

Crop Improvement

Onion

Developing dual purpose onion was continued for the second consecutive year. Out of 30 germplasms evaluated, several crosses were made and 60 successful crosses were evaluated. Eleven lines which performed well were selected for preliminary yield trial.

Development of inbred lines was started with 10 cluster onion germplasms for hybrid variety development. Ten different crosses of cluster onion were made and generation advancement was started to develop OPVs of cluster onion.

Chilli

- Six different crosses were made to develop a leaf curl complex tolerant high yielding Chilli variety with consumer preferable pod characters. Two good

crosses were identified out of six crosses and F_2 and back cross 1 generations were completed.

- Seven selected Chilli lines from two promising local land races were selected for the preliminary yield trial.
- Third inbreeding circle was completed with 15 selected Chilli lines and first inbreeding circle was completed with 22 lines. Sixteen of new Chilli germplasms were also collected.

Groundnut

Yield evaluation of recently generated advance breeding lines of Groundnut revealed that out of five lines KCGN-012-1 performed better than rest of the lines giving an average yield of 1,600 kg/ha under farmer field condition.

Finger Millet

Ultra shot Finger millet lines gave comparable yields with other recommended lines in station trials. In this experiments TVFM-03 performed well over the others yielding 539 kg/ha.

Foxtail Millet

Yield evaluation of white, red and black foxtail millet was carried out. Out of these variety white foxtail millet (KCFM-013-01) performed well yielding 470 kg/ha.

Brinjal

Eleven recently developed advance breeding lines were evaluated and purified stocks will be used to further evaluation.

Sesame

Two introductions of Sesame were tested in the NCVT. These lines showed drought tolerant characteristics with high oil content of more than 50%.

Tomato

A selection from KC-1-1 was advanced and studies are in progress to find out a heat tolerant Tomato lines with more seed content.

National Coordinating Varietal Trial

Soybean

Six newly developed of Soybean lines were evaluated with two check varieties. Check variety PB1 showed the highest yield of 1,905 kg/ha whereas the newly developed lines MISB 02 gave only 1,554 kg.

Cowpea

Three newly developed Cowpea lines were evaluated with the check variety Waruni. ANKCP 01 gave the highest yield of 4,757 kg/ha and check variety Waruni gave 2,840 kg/ha only.

Four newly developed Cowpea lines were evaluated with the check variety Dhawala. Newly developed line gave the highest yield of 3,177 kg/ha and check variety Dhawala gave 2,796 kg/ha.

Mung bean

Three newly developed Mung bean line were tested with three check varieties. MI-06 gave the highest yield of 1,994 kg/ha and ANK MB -48 gave 1,830 kg/ha.

Finger millet

Three newly developed Finger millet lines were evaluated with check variety Rawana.

Newly developed line gave the highest yield of 709 kg/ha.

Sesame

Ten newly developed sesame lines were evaluated with a check variety. Newly developed line gave the highest yield of 371 kg/ha.

Maize

Seven newly developed lines were evaluated. Newly developed line gave the highest yield of 7,108 kg/ha and check variety Pacific gave only 5,754 kg/ha.

Entomology

Chilli

Two nematicides were tested and found to be effective. Recommended dosages are as follows.

1. Abamectin SC - 2500 ml/ha -2 weeks interval (4 times)
2. Fluopyram -1250 ml/ ha - 6 months interval

Amaranthus

An experiment was conducted on Amaranthus crop to manage *Hypolixus truncatulus* through application of plant extract and intercropping. Neem seed extract and *Coleus aromaticus* extract showed repellent effect against *Hypolixus truncatulus.* Intercropping with Finger millet reduces the infestation.

Pathology

Red onion

Application of 15 t/ha of carbonized paddy husk level before planting seed bulbs reduced the *Fusarium oxysporum* associated with bulb rot incidence of red onion (*Allium cepa* L.).

Application of 15 t/ha of Biocher before planting red onion seed bulbs controlled the *Fusarium oxysporum* associated with bulb rot incidence of red onion (*Allium cepa* L.).

Groundnut

Ten breeding lines of Groundnut (*Arachis hypogaea* L.) were screened for late leaf spot (*Phaeoisariopsis personata*) and rust (*Puccinia arachidis*) diseases. K3 breeding line was moderately susceptible for rust disease and MUK breeding line was moderately resistant for late leaf spot diseases.

Weed Management

An observational study was carried out on management of *Cyperus rotandus* through crop rotation in high land. Sun hemp performed well to reduce the *C. rotandus* infestation.

Soil and Water Management

Tested 651 soil samples collected from five districts from North and East provinces Recommendations were provided to farmers.

Table 1.1.3.2: No. of soil samples analyzed

District	No. of soil samples
Kilinochchi	275
Mullaithivu	100
Vavuniya	42
Mannar	51
Trincomalee	183
Total	**651**

Breeder Seed production

1,140 kg of Groundnut (Variety Tissa) were produced.

Technology dissemination

RARDC conducted training programs, field days & demonstrations on OFC and rice for farmers, university student and school student in Kilinochchi and Mullaithivu districts.

- 04 field demonstrations –Maize, Black gram, Cowpea, Green gram and Ground nut.
- 04 field days
- 02 In -service trainings for Agriculture Instructors
- Technical advice provided for 130 clients
- 24 seminars were conducted for school students

A radio program was broadcasted through National Service (Thenral) of the Sri Lanka Broadcasting Corporation on rice pest and disease management.

Advisory services were provided to farmers on pest and disease management of crops. Majority of the problems were on vegetables. (40%)

Other projects and services

UNDP Project

This study is on the level of soil contamination due to saline water intrusion and land reclamation process in selected areas in the Poonaryn Divisional Secretariat Division, Kilinochchi.

A soil survey was conducted at three G.S Divisions of Poonaryn Divisional Secretariat in Kilinochchi district. Impact of barge on soil salinity was assessed. Recommendations were provided and demonstrations were conducted with salt tolerant rice variety.

FAO project

Four sub projects on the disciplines of plant breeding, entomology and pathology were submitted and funds were granted. Projects titles are as follows.

01. Breeder Seeds Production of Selected Crops

02. Production and release of parasitoid to control mealy bug in papaw.

03. Germplasm collection and establishment.

04. Adaptive trials on grapes and mushroom.

Projects will be continued.

Iranaimadu Irrigation Development Project (IIDP)

The main objective of this project is to identify location specific high yielding potential varieties and to recommend that varieties for better production and income. Studies are in progress.

NARP Project - Development of dual purpose Cluster Onion variety to fulfill the needs of planting materials and commercial bulb requirement in Sri Lanka

Out of 30 germplasms evaluated, several crosses were made among these types and 60 successful crosses were evaluated. Eleven lines which performed well have been selected to conduct Preliminary Yield Trial.

DEVELOPMENT ACTIVITIES

- Rehabilitation of Entomology laboratory
- Construction of drying floor and sales center.

AGRICULTURE RESEARCH STATION - THIRUNELVELY

Soil and Water Management

Drip irrigated Chilli cultivation with different spacing

Four different planting spacing from the lateral with furrowed basin irrigations were tested. Furrowed basin and planting 5cm from the laterals gave significantly high yield (44.5 t/ha & 38.9 t/ha).

Planting Red Onion with immature bulbs

Five different age of immature bulbs were tested with mature bulbs (55 days). Fifty days old immature bulbs gave significantly high yield of 19.3 t/ha.

Irrigation layouts on Red Onion yield

Four different irrigation layouts were tested in CRYL soil. Type of beds did not have any effect on the bulb yield. Planting bulbs on bunds and channels did not increase the bulb yield.

Utilization of *Antigonon leptopus* as liquid manure

Different concentrations of liquid manure were applied on Red Onion. There was no significant difference in the bulb yield in all the treatments.

Services

Soil testing

898 soil samples were tested and reports submitted to the farmers. 375 Samples tested for the Agrarian Center wise fertilizer recommendation from Northern districts. 311 Samples were tested for the National food program.

Weed Management

Control of *Cyperus rotundus* by cultural methods

Manioc, Sunnhemp, and Red Onion were continuously cultivated for three years. *Cyperus rotandus* population was gradually decreased in Manioc and Sun hemp cultivated plots by 70% and 90% respectively.

Plant Protection

Management of Little leaf disease (LLD) in Brinjal

- **Fertilizer management for LLD in Brinjal**

  Neem cake, Ammonium Sulphate, Urea and no fertilizer were evaluated. Ammonium sulphate gave the highest yield with lower disease incidence.

- **Screening of Brinjal lines for LLD**

  Fifteen lines received from HORDI were evaluated with check variety Thinnavely purple. All the lines were affected by LLD but the lowest incidence was observed in the line 8104 (17.6%).

- **Time of planting of brinjal with border crop Maize**

  The lowest disease incidence was observed in the February planting.

Management of yellow vein mosaic virus (YVMV) disease in Okra

Mulching, Neem leaves, Gliricidia leaves, Borders of Maize, Sorghum, Foxtail millet were tested with the local line TV8.

Maize and Sorghum borders significantly reduced the YVMV virus incidence and gave yields of 28.2 t/ha and 26.8 t/ha respectively.

Crop Improvement

Conducted all NCVT and VAT of other field crops and vegetables.

ADAPTIVE RESEARCH CENTRE – VAVUNIYA

Bg 12-1666 (4.8 t/ha) from the 2 ½ month age group, Bw 11-3403 (7.27 t/ha) and At 10-1374 (6.3 t/ha) from the 3 month age group were found promising. From the 4 ½ month age group Bg 09-606 (8.52 t/ha) and Bg 08-301 (8.37 t/ha) showed promising performance. AERON 09-03 (7.17 t/ha) and ZONGHWA (7.02 t/ha) were promising in the moisture stress line screening.

PLAN FOR 2017

- Designing of Augmenter to conserve the parasitoids for papaya mealy bug in the commercial Papaya field.
- Development of appropriate technology for management of Chilli nematodes.
- Preliminary varietal Trial for thrips resistant Chilli line.
- Construction of Auditorium.

STAFF LIST

Designation	No. Approved	No. Existing
Additional Director of Agriculture	01	01
Deputy Director of Agriculture	01	-
Assistant Director of Agriculture (Agric. Research)	13	03
Assistant Director of Agriculture (Agric. Development)	01	-
Assistant Director of Agriculture (Agric. Economics)	01	-
Administrative Officer	01	-
Agriculture Instructor (Special grade)	01	-
Economist Assistant	01	-
Program Assistant (Agriculture)	02	-
Development Officer	02	02
Agriculture Instructor	02	01
Research Assistant	05	02
Engineering Assistant	01	01
Public Management Assistant	04	01
Technological Assistant (Engineering)	01	-
Technological Assistant (Extension)	03	03
Technological Assistant (Research)	04	01

Designation	No. Approved	No. Existing
Driver	03	02
Tractor Operator	01	01
Storeman	01	01
Mechanic	01	01
Carpenter	01	-
Welder	01	-
Electrician	01	-
Technician	01	01
Research Sub Assistant	04	-
Budder	01	-
Circuit Bungalow Keeper	01	01
Office Employee	01	-
Watcher	08	08
Laborer	67	54
Laborer (Contract)	-	18
Total	**136**	**102**

1.2 HORTICULTURAL CROP RESEARCH AND DEVELOPMENT INSTITUE (HORDI) - GANNORUWA

Horticultural Crops Research and Development Institute (HORDI) located at Gannoruwa is the main research Institute of the Department of Agriculture responsible for the research and development activities of olericulture and floriculture. Thus its mandated crop groups are vegetables, root and tuber crops including potato and flowers. Regional research centers located at Bandarawela and Makandura and four other research centers located at Seetha Eliya, Girandurukotte, Teleijjawila and Rahangala come under the purview of the HORDI. In the research program, the institute mainly focuses on the development of adaptable vegetable varieties and appropriate crop management practices to ensure the productivity while safe guarding the environment. In addition to engage in research the institute involves in agriculture development activities which are directly connected with its research mandate.

BUDGET

Table 1.2.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	28,800,000	29,800,000	103
Capital	32,400,000	27,400,000	85
Projects			
• Development of promotion of correct fertilizer management (285-2-2-4-2502(13)Fertilizer-12)	3,560,000	3,030,000	85
• KOPIA – Mushroom (285-2-2-4-2502(13)Mush-28)	5,290,000	6,020,000	114
• Popularization and promotion of organic farming (HO-285-2-2-4-2502(13)ANSOFT-22)	3,800,000	3,560,000	94
• Integrated Management System for Plant genetic resource (285-2-2-4-2502(13) IMSPGR-13)	2,950,000	2,540,000	86
• Production of postharvest manuals and application of manuals (285-2-2-4-2502(13) AFACI-10)	2,300,000	3,840,000	167
• NARP (285-02-2-5-25-02-(11)	10,180,000	9,360,000	92

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• New hybrid & open pollinated variety development and basic seed production (285-02-02-8-2502-11)	10,000,000	9,770,000	98
• Postharvest management and market promotion (285-02-02-12-2502-13)	61,000,000	31,300,000	51
• National Food production Plan 2016-2018 vegetables (118-2-3-20-2502-02)	38,300,000	26,090,000	68
• Technological Interventions to Improve Production and Productivity of Selected Vegetables (118-2-3-20-2502-03)	19,000,000	11,890,000	63
• Technological Interventions to Improve Production and Productivity of Selected Flower crops (118-2-3-20-2502-04)	5,050,000	2,850,000	56
• Analysis of Soil samples (118-2-3-20-2502)	2,150,000	2,400,000	112
• Analysis of Soil samples - From Agrarian Dept	1,000,000	980,000	98
• Promotion of Organic fertilizer production & utilization (118-2-3-21-2502)	5,000,000	5,000,000	100
Total	**230,780,000**	**175,830,000**	**76**

PROGRESS

CROP IMPROVEMENT

Brinjal

Three Brinjal hybrids selected from previous trials were further tested for their performances in different regions. Among the 05 previously selected 'Lenairi' type hybrid combinations best 03 were selected and tested in preliminary yield trials. High yielding (> 40t/ha), open pollinated line SBN 8 (EG 11) and another open pollinated line EGFR (EG 12) yielding 35 t/ha and showing field resistance to bacterial wilt was also tested at PYT. Ten exotic Brinjal hybrids were evaluated in the field. In the process of development of drought resistant Brinjal hybrids, pre breeding materials have been progressed.

Tomato

Eight cross combinations identified in the previous year were tested at PYT level. In addition 12 open pollinated Tomato lines were also included into the PYT level. Twenty exotic Tomato hybrids were evaluated and one hybrid variety was identified as suitable for commercial cultivation.

Capsicum

Existing germplasm were evaluated to develop drought tolerant and heat tolerant varieties. Seed multiplication was done in 20 germplasm and observational trial was carried out for 10 germplasm. Six germplasm with better performances were identified. Another 15 germplasm are available for seed multiplication.

Varieties Prarthana F_1, CA 8, HYW and 1782 (maternal line of Prarthana hybrid) were evaluated for off season cultivation in Bibile (IL_{1c}), Moneragala (IL_{1c}), Siyambalanduwa (DL_{1b}) and Dambulla (DL_{1b}) areas. Prarthana F_1 (15.8 t/ha), CA 8 (7.9 t/ha), HYW (4.5 t/ha) and 1782 (12.9 t/ha) exhibited better performances in IL_{1c} Agro-ecological Zone and Prarthana F_1 (15.9 t/ha), CA 8 (8.8 t/ha) and HYW (3.6 t/ha) showed better performances in DL_{1b} Agro-ecological Zone.

Eight exotic capsicum varieties were evaluated and three varieties were recommended for large scale demonstrations. Two varieties were recommended for second season evaluation and the other three varieties were not recommended for large scale demonstrations due to poor yield performances.

Bean

Two locally developed lines were selected based on yield characteristics and tolerance to biotic and abiotic stresses for further evaluation. Further, 34 new cross combinations were made for the development of new desirable heat tolerant varieties.

Yard long bean

Adaptability studies of three locally developed lines were carried out at diverse environments. Two high yielding, collar rot tolerant lines identified were tested at NCVT. Preliminary observations revealed that these two lines could be cultivated effectively during off season. From the PYT tested 15 lines, 12 were identified for MYT. Out of 26 accessions tested, 12 accessions showed field resistance to collar rot disease, higher yield and desirable pod characteristics and hence these lines will be used as parental lines for the development of new varieties in future programs.

Luffa

Out of 23 germplasms tested, four accessions were selected based on their yield characteristics and tolerance to biotic and abiotic stresses. Further, out of 26 locally developed inbred lines, 6 were selected based on attractive long shiny dark green fruit characteristic for further improvement.

Cucumber

Four new cucumber cross combinations were identified for further evaluation. Suitable lines were identified form the F_2 population.

Bitter gourd

Two lines selected were tested for yield performance and one line was selected for further purification and to develop a breeding line. Six new cross combinations were made. These new cross combinations were field established and identified for further evaluation as all the combinations performed satisfactorily.

Embryo Rescue Technology for Vegetables

Embryo rescue technology for wide hybridization of *Capsicum annum* x *C. frutescence* was developed using 5-10 days old immature embryos obtained from the incompatible cross combinations (*Capsicum annum* x *C. frutescence*). Embryo rescue technology was also developed for the wide hybridization of *Momordica charantia x M. dioica* and of *Momordica charantia* x *M. subangulata* using 10-14 days old embryos.

Molecular identification of *Dioscorea* (Raja ala)

DNA extraction methodology and PCR based SSR technology was developed for *Dioscorea* (Raja ala). Genetically different and genetically close 'Raja ala' varieties were identified.

AGRONOMY

Optimum spacing for Capsicum variety Prarthana

The objective of this study was to identify the optimum spacing for newly released Capsicum variety Prarthana. Five spacings were tested and 40 x 30 cm^2 was identified as the optimum spacing for variety Prarthana. Studies are being continued to verify the results.

Plant training and spacing for Cucumber – Kalpitiya white

The objective of this study was to study the optimum spacing and the training technique to improve seed yield. Number of seeds/ fruit was significantly increased with the pruning treatment. Therefore seed yield can be increased with the pruning treatment. Experiment will be continued to confirm the results.

Plant training for Salad cucumber grown in protected house

Study conducted on plant training revealed that pruning of the 2^{nd}, 4^{th} and 6^{th} branches could increase the crop yield of salad cucumber. Plant pruning increased the crop yield by more than 50%. Study is progressing to confirm the results.

Plant training of Tomato grown in protected houses

Growing Tomato under protected houses is popular among farmers. However due to excessive vegetative growth, per plant yield is not comparatively high. An experiment was conducted to study the effect of training of Tomato grown under protected conditions on crop yield. Results revealed that pruning alternate branches in cherry Tomato can nearly double the crop yield. Study is in progress to confirm the results.

Plant growth regulators on seed yield

GA_3, NAA and Ethaphone were tested on seed yield and seed quality of CA 8 and 1782 parental line. According to results, seed yield increase in CA 8 was observed with the Ethaphone 25 ppm treated plots and seed yield increase in 1782 was observed with 50 ppm of NAA treated plots. Although there was an increase in seed yield in both, the yield increase was not significant. The experiment will be continued.

Evaluation of Plant Growth Regulators

Chloromaquat Chloride 50% SL application was tested on growth and yield of Capsicum. Application of the growth regulator did not increase the plant performance. Diethyl aminoethyl hexanoate (DA6) showed a significant effect on yield when applied at seedling stage and at early flowering stage at the concentration of 8 ppm. Increasing number of flowers and fruit setting percentage and extension of the period of harvest were also observed.

FLORICULTURE

- A research on development of new varieties of ornamentals through mutation breeding was initiated and five potential wild flower varieties were subjected to Gamma irradiation to identify LD 50 value of each variety and evaluation is continued. *Diffenbachia picta* cuttings were subjected to physical mutagenesis are also under evaluation process.
- Germination of *Munronia pinnata* was evaluated under different environmental conditions. Significantly high germination percentage was observed beneath mother plants. Thumbnail pruning of *M. pinnata* resulted two or more branches, but only one leading branch was dominated in upward growth.
- Stomatal behavior of *Zamioculcus zamifolia* (ZZ plant) - a facultative CAM photosynthesis plant - was studied under severe water stress conditions (>3 weeks drought). Plant did not close stomata during day time even under water stress in high humid condition of Mid Country Wet Zone.
- Factors affecting colour development of *Cordyline fruticosa* cv. tricolor was studied. Its color changed with the time of the year but did not depend on the shade level and potassium fertilizer level.

In-vitro propagation of Anthurium (Lanka Kumari, Lanka Beauty)

Tissue culture protocol was developed for *in-vitro* planting material production of DOA recommended Anthurium varieties (Lanka beauty and Lanka Kumari). Young leaves were used as explants (Initial planting material) and media were developed for the establishment (MS + 0.2 mg/l 2-4 D, 2 mg/l BAP) and multiplication (MS + 2 mg/l BAP) of plating material. Compost, Surface soil, Coir dust, and Sand 1:1:1:1 medium was identified for potting and acclimatization. True to type flowers were observed during 1 - 1 1/2 year period.

Genetic variation in Anthurium (*A. andraneaum*) varieties

Six cultivars of Anthuriam; five local promising lines including “Lanka Kumari” and “Lanka Beauty” and an exotic variety “Tropical” were used to identify the genetic relationship among local Anthuriam varieties. DNA was extracted from young leaves and subjected to PCR with seven RAPD markers and five SSR markers. Two local Anthurium varieties, Lanka Kumari and Lanka Beauty exhibited a distant relationship with Tropical variety but both local varieties were closely related.

SOIL FERTILITY & PLANT NUTRITION

Plant nutrient need of hybrid Capsicum

A study was conducted to develop a new fertilizer recommendation for hybrid Capsicum. Different rates of nitrogen (N) and potassium (K) fertilizers were applied based on nutrient removal data. There was no response to the application of N fertilizer beyond 120 kg/ha for both hybrids tested. Similarly, no response to K fertilizer was observed at soil test value of 267 mg/kg. Study will be continued to identify the best nutrient combination for hybrid Capsicum.

Need of Zn and B for Cabbage and Beet

Application of two different rates of micronutrients namely Zinc (Zn) and Boron (B) on the performances of Cabbage and Beet was studied. Although there was a slight yield improvement to be observed, effects were not statistically significant.

Toxic trace metal contents in Rice

A study was conducted to assess the toxic trace element contents in rice grown in Sri Lanka. Different varieties of rice samples collected from different areas of the country were analyzed for Cadmium (Cd) and Arsenic (As) contents. Mean contents of Cd and As were 0.093 mg/kg and 0.012 mg/kg respectively and those values were lower than the maximum permissible level of the WHO.

Toxic Trace metal contents and bio accumulation factors of Cd, Zn and Cu

A study was conducted to identify trace metal contents in soils and vegetables in intensive vegetable cultivation areas and their bio accumulation factors. Total contents of toxic trace metals of Zn, Cu and Cd in different vegetable crops collected were within the permissible levels. Study also showed that bioaccumulation factor for Cd was higher than that of the Zn and Cu.

Bioavailability of Cadmium in TSP fertilizers

A study was initiated to determine the bioavailability of Cd by plants due to the application of Triple Super Phosphate (TSP) fertilizers. Experiments were conducted under both green house and field conditions. Though crop yield was not increased with the application of excess amounts of TSP, Cd contents of both soil and plant were increased owing to over fertilization of vegetables.

Nitrogen fertilizer application on nitrate accumulation of vegetables

A study was conducted using leafy vegetables of ‘Kangkung’, ‘Mukunuwenna’, Spinach and Lettuce with increasing rates of N application to observe the content of nitrates in leaves. Nitrate contents in leafy vegetables were increased with the rate of N application. Therefore, application of nitrogen fertilizer needs to be regulated to avoid the buildup of nitrates in leafy vegetables as excess nitrate intake can be harmful to human health.

ORGANIC FARMING

Nutrient Management

Split application of different organic nutrient sources with dried Gliricidia leaves on the growth and yield of Snake gourd and Brinjal was tested. Results showed that crop yield of both Snake gourd and Brinjal could be maintained with less quantity of basal manure application when combined with split application of dried Gliricidia leaves and poultry manure. Hence, by practicing split application, rate of manure application could be reduced by nearly 40% in organic nutrient management.

Application of Partially Burnt Rice Husk

The effect of the application of Partially Burnt Rice Husk (PBRH) with compost and poultry manure under mix cropping of Tomato, Cabbage and Carrot were tested. Highest total mix yield (56.1 t/ha) was obtained in application of NPK with 250 g of PBRH treatment followed by poultry manure with 250 g of PBRH (54.1 t/ha).

Long term application of compost

At the end of 32nd and 33rd seasons in a long-term study under vegetable cultivation, combined use of 40 t/ha compost and recommended NPK fertilizers produced the highest yield of Cabbage (22 t/ha) and Bean (11.2 t/ha) respectively. Compost (40 t/ha) alone treatment produced 16.6 t/ha of Cabbage and 4.2 t/ha of Beans after 32nd and 33rd season respectively.

Screening of different varieties of vegetables for low input conditions

A study was conducted to identify suitable vegetable crops/ varieties for organic farming conditions. Eight varieties of Brinjal, five varieties of Capsicum and five varieties of Mae were tested under low input condition. Brinjal variety Anjalee and two other pipeline varieties EGH 8 and 9, Capsicum varieties CA 8 and HYW and Mae varieties “325” and “324” performed well under low input conditions compared to the other varieties tested.

Influence of tillage on soil physical properties

An observational study was initiated to assess effects of minimum tillage on soil physical properties of Reddish Brown Latosolic soils. No appreciable variations between the two tillage practices were observed in soil properties. However, Okra produced 48 % higher yield under tillage treatment. Experiment will be continued.

Nitrogen fixing inoculums with Capsicum

Identified nitrogen fixing bacterial inoculum was tested with Capsicum variety under greenhouse condition. The highest shoot dry weight, total dry weight and total nitrogen uptake was shown by the treatment with 50% recommended N with inoculums. Inoculums alone treatment showed the lowest growth parameters. This shows that approximately 50% of Urea can be substituted with the selected inoculums for Capsicum.

Soil microbial diversity under different farming histories

Microbial diversity under a virgin land, conventional farming, organic farming and home garden were studied. Preliminary soil respiration analysis showed the highest Carbon dioxide emission was recorded in organically grown soils followed by home garden and conventional field. The lowest was observed in the virgin land. Highest potential nitrification rate was also recorded in organically cultivated fields and it was least in the conventionally grown field. Free living nitrogen fixing bacteria was available in all four types of soils and the highest was recorded in organic fields. Phosphorus solubilizers were rarely found in all soils. Potassium solubilizers were available in conventionally grown fields at high amount while their presence was less in home gardens. The highest decomposers population was found both in organic soils and virgin soils.

ENTOMOLOGY

Insecticide efficacy and resistance of aphids

The lower efficacies of insecticides in controlling virus vectors are a serious issue in virus diseases management in vegetable crops. Therefore, toxicity of insecticides belongs to different families were tested against field collected aphids from Gannoruwa, Marassana, Galenbindunuwewa and Welimada. Results showed that all populations except from Welimada were moderately resistant to the Neonicotinoids. The efficacy of all populations with Etofenprox which is not currently recommended for aphid control but widely used by farmers was very low. Since use of Neonicotinoids on aphid control would facilitate further development of resistance, it is advisable to cease the usage of this group of insecticide for a considerable period of time.

Effective insecticides with new mode of action for virus vector control in Cucurbits

Continuous use of insecticides with same mode of action (MOA) enhances the insect resistance to such products. There is a need to introduce insecticides with new MOA to minimize vector outbreaks. Therefore, new insecticide was screened against whitefly, aphids, thrips and plant hoppers. The four insecticides Sulfoxaflor 50% WG (0.3 g/l and 3 new sources of Pymetrozine 50% WG (0.5 g/l) were significantly effective against whiteflies and aphids. Hence, Sulfoxaflor 50% WG and Pymetrozine 50% WG were recommended at the rates of 0.3 g/l and 0.5 g/l respectively, for aphid and whitefly control in Cucurbits.

Varietal screening for virus vectors – Bitter gourd

Identification of insect resistant varieties is essential for renewal of IPM packages. Hence, four popular varieties of Bitter gourd namely Neerogi, Palee, TW and Shakthi were screened for virus disease severity and vector incidence. Among four varieties Palee and Neerogi produced significantly higher yield, low virus incidence and whitefly occurrence. Experiment will be continued to confirm the results.

Repellents and attractants for virus vector control

Virus vector control in Tomato using Coriander as a repellent plant and yellow

sticky traps as attractant (Push-pull theory) were tested in the field. Coriander intercropped with Tomato gave a significant low number of aphids. The number of whiteflies trapped in yellow sticky traps outside the treatment plots was also significantly higher than in the control plot which did not have a Coriander intercrop. Virus infected plant population was greater under the control treatment. The experiment is continued.

Population dynamics of virus vectors

Population dynamics of virus vectors in Cucurbit fields were monitored from mid-2015 to mid-2016. Rainfall, relative humidity and wind velocity showed a positive correlation (<0.001) with the virus vector population. However, temperature showed a negative relationship. The respective insect count data on whiteflies, thrips and aphids were reduced with increasing rainfall, and relative humidity. Decrease in temperature also reduced the insect counts. The study will be continued.

Introduction of a new Nematicide

Abamectin 20 g/l SC was identified and recommended for management of root knot nematode on Guava. This was included as a component of integrated nematode management package developed for the management of root knot nematode on Guava.

Nematicidal activity of *Pleurotus* spp. and Oyster mushroom substrate

Seven *Pleurotus* spp. were subjected to laboratory bio assay to identify the prominent *Pleurotus* spp. having nematicidal activity. *Pleurotus ostreatus* fungi species showed a significantly higher suppression of nematode. Plant house experiment showed that 18 g rate of 2 ½ months age oyster mushroom substrate also significantly reduced the nematode infection.

Low cost technique of mass rearing Papaya mealy bug parasitoid, *Acerophagus papayae*

The papaya mealy bug (PMB) was introduced to control the mealy bug infestations few years back. However, in recent past again several outbreak of the pest were reported form different parts of the country. Hence, mass rearing of parasitoid *Acerophagus papayae* was initiated. Simple and low cost method for mass production of papaya mealy bug parasitoid, *Acerophagus papayae* was developed using small plastic cups.

Biological management of leaf miners

A survey was conducted in different parts of the country and few parasitoids were identified to control leaf miners. Among them most prominent parasitoid spp. were reared under laboratory conditions. Two hundred and fifty (250) parasitoids were released to few farmers' fields at Gampaha, Nittambuwa, Maradagahamula and organic field at HORDI.

Mass rearing of C*heilomenes sexmaculata*, an aphid predator for Beans

Most promising aphid predator *Cheilomenes sexmaculata* was reared under plant house conditions using aphid *Myzus persicae*.

Mass rearing of Fruit fly parasitoids

Two fruit fly parasitoids, *Diachasmimorpha longicaudata* and *Psyttalia fletcheri* were mass reared. Around 3,000 adults from both species were produced and used for filed release.

Brinjal genotypes for resistance/ tolerance to Shoot and Fruit Borer (BSFB) (*Leucinodes orbonalis*)

In order to expand integrated management options of the pest, available Brinjal germplasm (114 germplasms/ wild relatives) were tested to identify resistant/ tolerant genotypes for Brinjal shoot & fruit borer by assessing % of shoot & fruit infestation. 15 Genotypes {(Black beauty, 303, 7171, 66, 799, 8108, 2734, 8104, 8107, 8534, 2733, S1S1 (W), ANG1 (W), ANG2(W) and L1N1(W)} showed lower infestation compared to highly susceptible genotypes.

Best Larval Diet for Melon-fruit fly, *Bactrocera cucurbitae*

Mass rearing of insects requires protocols for the production of insects that are behaviorally and physiologically similar to those of the natural population. In this study, five larval diets (Thailand, Mauritius, Standard & Liquid and NPQS) were tested as compared to four natural foods; Pumpkin, Bitter gourd, Snake gourd and Cucumber. The tested natural and artificial diets except liquid diet were identified as favorable. NPQS diet and Thailand diets were selected on the basis of the cost factor and high male ratio for the use of mass rearing of *B. cucurbitae*.

Improving IPM package for Bean yellowing

Bean yellowing due to Horse gram yellow mosaic virus transmitted by whitefly *Bemisia tabaci* is a severe problem among bean growing farmers in Sri Lanka. A research was conducted to upgrade the existing IPM package. Experiments conducted at both research fields and farmer fields revealed the following package as effective in controlling Bean yellowing: Live/ physical barrier + Seed treatment (Thiamethoxam 70%WS 3.5g/1 kg of seed) + alternative application of Pymetrozin 50% WG + Buprofezin 10%WP at 7-10 days interval until flowering + Sticky trap treatment.

Pilot scale testing of insecticides for Tomato

Pymetrozin 50% WG, Sulphoxyflor 50% WG, Potassium salts of fatty acid 49% SL and Cyantrainiprole 10.26% OD were evaluated with Thiamethoxam 25% WG for virus vector control treatment. These new chemicals show different modes of action compared to the already recommended chemical and hence application of these will prevent the resistance buildup of vectors. Pilot scale trial showed that all new chemicals could effectively be used in vector (white fly, thrips, aphids) management.

PLANT PATHOLOGY

Dioscorea diseases

Studies were conducted to identify causal organisms of major diseases and resistance sources of *Dioscorea*. Anthracnose and rust was identified as two fungal diseases caused by *Colletotrichum gloeosporioides* Penz. and *Goplana dioscoreae* Cummins, and their

pathogencity was established. All varieties of *D. alata* were highly susceptible to Antracnose while *D. bulbifera* showed moderately resistance. All varieties belonging to *D. esculanta*, except 'Nattala' were resistant to anthracnose. Cultivars; 'Nattala', 'Maha kukulala' and 'Suta kukulala' belonging *D. esculanta* were highly susceptible to rust disease.

Diversity of *Ralstonia solanacearum* species complex

Sample collection was done from Matale, Ragala, Nildandahinna, Karalliyadda, Gannoruwa, Rahangala, Kilinochchi and Jaffna areas and pathogen isolation and long term storage was completed for 79 samples. DNA extraction methods, PCR conditions and some of the biochemical methods were optimized for pathogen clarification. Biovar/ pathovar identification and molecular characterization will be done in future.

Detection of Papaya Ring Spot virus infection

Papaya Ring Spot virus (PRSV) is a major devastating viral disease in Papaya cultivation in Sri Lanka. It is necessary to identify PRSV disease resistant source. A study was conducted to identify the potential resistance to Papaya Ring Spot virus in mountain Papaya as there are no resistant sources found among *Carica papaya*. *Carica papaya* and mountain Papaya were inoculated with PRSV by mechanical inoculation technique. Total RNA was isolated and PRSV RNA genome segments were amplified using three sets of primers. Primers were able to amplify in inoculated *Carica papaya* while negative amplification was observed in mountain Papaya confirming the resistance for PRSV infection.

Soil amendments for suppression of fungal pathogen in Mae

Collar rot disease caused by *Sclerotium rolfsii* is one of the most destructive diseases of Mae in Sri Lanka. Studies were conducted to evaluate the effect of plant extracts under *in-vitro* condition against *S. rolfsii*. Results indicated a significant reduction in collar rot when treated with *Azadiracta indica* and *Pannicum maximum* in pots. Root extraction of *P. maximum* and seed extraction of *Bracharia juncea* were found as the most effective to control *S. rolfsii*.

Bio-efficacy of fungicides

New fungicide Tetraconozole 4% ME (Dormark) (10 ml/10 l of water) and new source Thiophanate - methyl 70% WP (6g/10 l of water) can be effectively used to control powdery mildew of Cucurbits. Flumorph 10% + Mancozeb 50% WP) (20 g /10 l of water) and Azoxystrobin 120 g/l+ Tebuconazole 200 g/l SC (3.5g /10l of water) can be effectively used to control Tomato blight.

Health testing of imported Seed Potato

A total of 134 consignments of seed potato imported from different countries were tested for pathogens. Common scab, silver scurf, netted scab and black scurf were the diseases frequently observed in these consignments. Black leg and dry rot (*Fusarium* spp.) were seldom observed. Special instructions for storage were given for consignments having

high incidence *Erwinia carotovora* and *Geotrichum candidum.* Out of 134 consignments, three were rejected.

Screening of Banana planting material against Panama disease

Forty seven (47) Samples received from Matale and Thelijjawila were tested with PCR technique to identify Panama disease free planting materials. Out 47, eight samples were positive for Panama disease.

Evaluation of exotic varieties for bacterial wilt

Varieties/ accessions were screened for resistance to bacterial wilt caused by *Ralstonia solanacearum* under greenhouse conditions.

Table 1.2.2: Susceptibility of varieties evaluated for bacterial wilt

Crop	No. of varieties evaluated	Moderately resistant (10-20%)	Moderately susceptible (10-20%)	Susceptible
Tomato	14	03	05	06
Pepper	10	03	04	03
Brinjal	01	01		

DEVELOPMENT

Awareness Programs and Technology Transfer Programs

Basic training and awareness programs on different subjects of agriculture were conducted for more than 6,000 participants from various organizations representing schools, government secretariats, Mahaweli Authority and different societies.

Industrial training programs

Table 1.2.3: Details of industrial training programs conducted

Degree sought	Number of Students	University	Training period
B.Sc. (Agriculture) NVQ Level 6	33	University of Kelaniya	6 months
		University of Peradeniya	6 months
		University of Ruhuna	6 months
		University of Jafna	6 months
		University of Uva Wellassa	6 months
		Open University -Kandy	3 months
		Open University -Matara	3 months
Diploma NVQ Level 6	51	School of Agriculture - Kundasale	6 months
		School of Agriculture - Angunakolapelessa	6 months

Degree sought	Number of Students	University	Training period
Diploma NVQ Level 6	51	Advance Technology Institute - Naiwala	6 months
		Advance Technology Institute - Ampara	6 months
Diploma NVQ Level 3/4/5	75	Technical College - Embilipitiya	6 months
		Technical College - Anuradhapura	6 months
		Technical College - Aruppola	6 months
		District Agriculture Training Center - Galpalama	6 months
		District Agriculture Training Center - Nawayalathenna	6 months
		School of Agriculture Wariyapola	6 months
		School of Agriculture- Bibile	6 months
		National Youth Services Council	6 months
Total	**159**		

Exhibitions

Table 1.2.4: Details of exhibitions/ training programs conducted

Program/Station	Date	Target Group
Madeena National School, Siyambalagaskotuwa	2016.01.31- 2016.02- 01,02	All category
Rajasinghe College, Ruwanwella	2016.02.10	All category
Kalugamuwa Central College, Gelioya	2016.02.04	All category
Crop Clinic Program	2016.02.24	All category
Gonakelle Junior College, Kandapola	2016 .05 -27,28,29	All category
Rajarata University of Sri Lanka	2016 .05 -18,19	All category
Labuduwa Farm	2016 .09 -01, 02,03,04,05,06,07	All category
Yaqeen Model School, Akurana	2016 .09 -28,29,30	All category
Agriculture exhibition, Ampara	2016.08-29,30	All category

Research Extension Dialogue

Table 1.2.5: Details of research extension dialogues conducted

Program/ Station	Date	Target Group
Pupuressa, Kandy	2016.10.13	Farmers, Field officers
Kegalle	2016.12. 08	Farmers, Field officers
Thenna, Kandy	2016.12.16	Farmers, Field officers

Services

Table 1.2.6: Details of services provided

Service	Number	Remarks
Leaflets Distributed	8,210	145 variety of leaflets are available
Advisory service	38	Written answer
	200	Technical advice by telephone
	136	Verbal advise for visitors
Diagnosis	43	Nematode infections; advises given
	75	Insect damage; advises given
Training on vegetable breeding	38	Agriculture Professionals
Training on hybrid seed production	42	Extension agents, seed producers of government seed farms and private farms
Training on soil sampling and soil testing	200	Department of Agrarian Services
Provincial Technology Working Groups	10	
Radio Programs	10	On different topics

Laboratory Analytical Services

During the year, 1,967 soils, 190 composts, 12 water and 150 plant samples were analyzed and reports were submitted. Plant samples received from farmers with various problems in secondary and micronutrients were also analyzed for those nutrients.

Breeder seed production

Table 1.2.7: Quantities of breeder seeds produced

Crop	Variety	Quantity (kg)
Bean	Gannoruwa Bil	37.7
Luffa	Gannoruwa Ari	4.5
Mae	Gannoruwa A9 Mae	46.45
	Gannoruwa Hawari	39.75
Winged bean	SLS 44	8.2
	Krishna	6.2

Crop	Variety	Quantity (kg)
Bitter gourd	Matale Green	3
	Thinneweli white	2
Cucumber	Kalpitiya white	2
	R2	3
Tomato	Ravi	0.175
	T 245	1.5

PLAN FOR 2017

- Development of hybrid vegetable crop varieties adaptable to local farming conditions.
- Development of climate resilient open pollinated vegetable crop varieties.
- Development of appropriate technology package suited for different environmental conditions.
- Development and identification of environmentally friendly, safe input management options for vegetable growers.
- Domestication and popularization of traditional and wild vegetable crop species.
- Development and popularization of mushroom production technology.
- Production of nuclear seed materials.

STAFF LIST

Designation	No. Existing
Director (Acting)	01
Additional Director (Acting)	01
Deputy Director (Research)	01
Assistant Director of Agriculture (Research)	17
Assistant Director of Agriculture (Development)	01
Administrative Officer	01
Senior Librarian	02
Program Assistant (Agriculture)	09
Development Officer	02
Agriculture Instructor	12
Research Assistant	13
Public Management Assistant	12
Technological Assistant	01
Farm Clerk	03
Driver	08
Tractor Operator	02
Storeman	01
Machinist	04
Carpenter	01
Electrician	01
Machine Minder	03
Technician	01
Research Sub Assistant	10
Water Pump Operator	01
Bee Demonstrator	01
Budder	01
Circuit Bungalow Keeper	01
Office Employee	01
Watcher	13
Sanitary Laborer	01
Unskilled Laborer	141
Total	**267**

1.2.1 FOOD RESEARCH UNIT (FRU) – GANNORUWA

The Food Research Unit comes under the purview of Horticultural Crop Research and Development Institute (HORDI) of the Department of Agriculture. FRU is primarily responsible for conducting the research on post harvest technology and product development of food crops. Quality evaluation of samples derived from crop improvement program is another responsibility of the unit. FRU performs collaborative programs with non-governmental and private sector organizations on technology development, transfer and use of machineries. In addition, the unit provides the necessary facilities and guidance for under-graduate and post-graduate students to conduct their research on diverse aspects of postharvest and processing technologies.

BUDGET

Table 1.2.1.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	1,585,630	1,502,149	95
Projects			
• Improvement of vegetable value chain	100,000	100,000	100
• Production of postharvest manual for Vegetable / Fruit – FRU • AFACI	3,800,000	3,800,000	100
• Postharvest loss reduction of fruits - SDF	61,000,000	29,500,000	48
Total	**66,485,630**	**34,902,149**	**52**

PROGRESS

RESEARCH

Phytochemicals in Leafy Vegetables

Green leaves are rich in phytochemicals. Kankun, Gotukola, Mukunuwenna, Sarana, Salad leaves and Karapincha have high polyphenol contents. Heat treatment (3 minutes at 70^0C) slightly reduced the polyphenol content but substantially lowered the content of vitamin C. Antioxidant activity was high in Salad leaves, 'Sarana' and 'Karapincha'. Heat treatment reduced the antioxidant activity in 'Sarana' and Salad leaves. Eating in fresh form ('Sambol') is the best way to increase the intake of phytochemicals, however 2-3 minutes of cooking ('Mallung') do not reduce the polyphenol content and antioxidant activity of these green leafy vegetables and 'Karapincha'.

Phytochemicals in Vegetables

Presence of phytochemicals in Bean, Beet root, Cabbage, Eggplant, Spinach and Onion was studied. All six vegetables contained a rich antioxidant profile in raw form. Ascorbic acid content of all vegetables decreased after boiling. Although cooking Eggplant for 7 minutes at 70 ^{0}C increased the total polyphenol content and antioxidant activity, in other vegetables (Cabbage, Beans, Beet root Onion and Spinach) antioxidant activity was decreased. In Beet roots and Cabbage, the polyphenol content was increased with cooking.

Induced Ripening of Banana

Experiments conducted on Banana showed that ripening of banana can be induced with half of the concentration of Ethrel used for the ripening induction in climacteric fruits.

Product Development

Local salad dressings are not available at the market. Therefore a new technology has been developed to produce salad dressing for small and medium scale entrepreneurs. Local oils such as Soy oil, Gingelly oil, Corn oil and Vegetable oil were used to prepare salad dressing and the storage life of the product was 3 months.

Post harvest loss of Tomato is high and only Tomato sauce is available presently at the market. Technology was developed to produce Tomato cordial that can be kept under ambient temperature for 3 months.

Consumption of 200 g of vegetables/ day is important for healthy life. Development of value added vegetable products suitable for commercial purposes is important. Fruit and vegetable mixed jam incorporating Carrot, Lime and Banana was developed. The product can be kept for 6 months. Bitter gourd ‘seeni sambol’ can be stored for 10 months under room temperature.

DEVELOPMENT

Technology dissemination

Radio Programs

Table 1.2.1.2: Participation in Radio/ TV programs during 2016

Title	Radio/ TV	Resource person
Handling of fruits & vegetables	Kandurata Sevaya, SLBC	K.H. Sarananda
Post harvest loss reduction of fruits & vegetables	Kandurata Sevaya, SLBC	K.H. Sarananda
Correct way of vegetable consumption	Guwan Viduli Govi Sevaya, SLBC	S.M.A.C.U. Senaratne
Fruits and vegetable consumption	Kandurata Sevaya, SLBC	S.M.A.C.U. Senaratne

Title	Radio/ TV	Resource person
Induced ripening	Kandurata Sevaya, SLBC	S.M.A.C.U. Senaratne
Fruit consumption	Rajarata Sevaya, SLBC	K.H. Sarananda
Activities of Food Research Unit	Shraddha	S.M.A.C.U. Senaratne

Trainings

Officers attended as resource persons for 41 programs on post harvest technology, food processing and packaging at following institutes.

- In Service Training Institutes – Department of Agriculture
- Vidatha Centres
- Small Enterprise Development Division, Ministry of National Policies & Economic Affairs
- Chamber of Commerce
- JAICA
- National Food Promotion Board
- Department of Industries
- Mahaweli Authority

Training programs were conducted at Food Research Unit for the following institutes during the period under review on postharvest technology and product development.

- Post Graduate Institute of Medicine
- University of Sabaragamuwa
- University of Peradeniya
- University of Uva Wellassa
- University of Wayamba
- Sri Lanka School of Agriculture, Kundasale
- Sri Lanka School of Agriculture, Dambulla
- Sri Lanka School of Agriculture, Kuliyapitiya
- Technical College, HARDI
- Technical College, Aquinas
- Technical College, Aruppola, Kandy
- Vidatha Centres
- Small Enterprises Development Division, Ministry of National Policies And Economic Affaires
- Chamber of Commerce
- JAICA
- National Food Promotion Board
- Department of Industries
- Mahaweli Authority
- Department of Health
- Department of Education

The topics covered during these trainings were postharvest technology and food processing of Soya, rice, other cereals & pulse based products, processing of fruits and vegetables, milk based food products, food quality analysis, food processing & candied products, bites, pastes and bakery products. Packaging of raw and processed foods, Food Nutrition, Food Safety issues, Food Security through home gardening, Poly tunnel productions and Marketing were also covered in these trainings.

Food product development trainings were conducted at FRU and participation is mentioned below according to the product.

Table 1.2.1.3: Participation in training programs conducted during 2016

Product	Number of participants
Vegetables	162
Fruits	139
Spice powder	05
Bites	49
Milk products	89
Mushroom	03
Soya products	57
Millet products	16
Confectionaries	31
Other	13

Exhibitions

Food Research Unit participated at the following exhibitions. 'Wasa wisa nethi ahara' - BMICH, 'Fruits 200g' - FCRDI, Horana and Sri Lanka School of Agriculture, Kundasale, Provincial Agriculture (Mannar), Department of Industries (Vauniya) and Schools.

Laboratory Analytical Services

Quality analysis was performed for Department of Agriculture, food processors and farmers on following products during the period under review. Necessary guidance was provided for clients on further improving the standards.

Table 1.2.1.4: Quality assurance tests performed

Product Name	No. of products
Vegetables	139
Fruits	61
Spice powder	27
Flour	23
Milk	04
Mushroom	05
Coconut oil	06
Sprouted beans	05
Confectionaries	14
Treacle & Bee honey	19
Microbiological analysis	18
Other	56

Overseas trainings

- S.M.A.C.U. Senarathne, AFACI project, Postharvest technology, June 14-28, Thailand
- S.M.A.C.U. Senarathne, AFACI project, Postharvest technology, July 5th-9th, Vietnam

PLAN FOR 2017

Post harvest loss reduction

- Effect of different activated carbon sources on ripening, quality and shelf life of harvested Tomato.
- Identification of storage life of local yams and development of cooking types with value addition.

Product development

- Physical properties of Sour soup (*Annona muricata*) powder produced by spray drying technique.
- Identification of the production ability of heat shocked Low Country fresh cut vegetables.
- Microwave assisted vacuum dehydration of fruits and vegetables.
- Preparation of nutritious 'rotti' and 'pittu' mixtures.

Quality assurance

- Determination of antioxidant levels of vegetables and their activities as affected by cooking method.
- Identification of index for Bee honey
- Development of palatable products from Dragon fruit and Mango varieties.

STAFF LIST

Designation	No. Existing
Deputy Director (Acting)	01
Assistant Director of Agriculture (Research)	01
Development Officer	02
Agriculture Instructor	01
Research Assistant	04
Public Management Assistant	02
Driver	01
Machine Operator	01
Electrician	01
Research Sub Assistant	02
Watcher	02
Labourer (Permanent)	07
Labourer (Contract)	02
Total	**27**

1.2.2 REGIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT CENTRE (RARDC) - BANDARAWELA

RARDC, Bandarawela, located in the Up Country Intermediate Zone, 1400 m above mean sea level, is the main Centre responsible for development of appropriate technologies to enhance the yield and quality of agricultural commodities cultivated in the Uva region and Balangoda segment of Sabaragamuwa province. Its mandated area covers IU_2, IM_2, IM_3, WM_3, IL_2 and WM_3 agro ecological regions. The Centre functions under the purview of HORDI, and has a satellite station at Rahangala. Other than research activities, the Centre involves in many technology transfer and agricultural development activities including production and distribution of quality planting materials of potato, fruit and flower crops.

BUDGET

Table 1.2.2.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
RARDC-Bandarawela			
Recurrent	2,906,250	2,872,038	99
Capital	6,980,562	4,252,264	61
Projects			
• Technological interventions to improve production and productivity of flower crops	5,050,000	2,235,918	44
• Development of local gerbera varieties with high commercial value, using conventional and molecular breeding techniques	689,000	563,775	82
• Development of high yielding and high quality local bell pepper hybrids, using conventional and biotechnical breeding techniques	456,500	373,413	82
• Technological interventions to improve production and productivity of selected fruits (Strawberry)	2,500,000	1,211,565	48
• NARP - Tomato	567,400	425,001	75
• NARP - Beans	321,400	298,540	93
• Development of Citrus Fruit Villages	300,000	111,087	37
• NARP - Citrus (Bandarawela)	200,000	105,655	53
• NARP - MPhil Potato project	281,646	187,599	67

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• Technological Interventions to improve production and productivity of selected vegetables	200,000	330,485	165
• Bean yellowing control in Badulla district	400,000	175,742	44
• Seed potato production program	2,500,000	1,599,419	64
• Seed potato production program collaborative with Uva province agriculture (Food production program)	13,100,000	4,869,600	37
• KOPIA soil fertility project	250,000	181,463	73
• ANSOFT	250,000	174,474	70
• F_1 Hybrid	1,000,000	993,157	99
• Seed potato production program	2,300,000	940,149	41
Total	**40,252,758**	**21,901,343**	**54**
ARS -Rahangala			
Recurrent	765,934	534,949	70
Capital	63,000	63,400	101
Projects			
• Technological interventions to improve production and productivity of selected fruit crops (Citrus)	1,700,000	1,317,396	77
• Development of high yielding Citrus varieties (NARP)	200,000	153,305	77
• GAP	157000	116,560	74
Total	**2,885,934**	**2,185,610**	**76**
Grand Total	**43,138,692**	**24,086,953**	**56**

PROGRESS

Crop Improvement

- F_1 and F_2 evaluations were completed for three locally developed Bell pepper hybrids and generations were advanced up to F_3.
- Use of 70% alcohol followed by 20% Clorox is the best method to surface sterilizes Bell Pepper flower buds. Late uninucleate and early binucleate stages were successful for anther collection. 2, 4 – D (1mg/l) was identified as the best callus induction medium for Bell Pepper anther culture.
- Germination tests were completed for 150 PGRC accessions and 15 varieties of Tomato. Seeds of 50 accessions were multiplied to initiate *in-vitro* heat and drought screening.
- Five Tomato accessions were cultured *in-vitro* and data recording is in progress to identify drought resistant accessions.

- Seventy grams of "Katugastota Wilt Resistant" Tomato seeds was produced to initiate a program to improve the fruit quality through induced mutation.
- Three improved pole bean lines (PB161, PB 151, PB 149) were nominated to VAT.
- A 159 local pole bean accessions were screened for rust to develop a rust resistant/ tolerant pole bean variety.
- Among 115 local pole bean lines screened for heat resistance, 40 lines were selected for further evaluation as an initial step to develop heat resistant variety.
- F_1 evaluation of 15 pole and 18 bush bean lines were completed and generations were advanced up to F_2 to develop a short age variety.
- Pole bean germplasm collection was initiated and 27 lines were collected from major bean growing areas of UCIM zone.

Agronomy

- Simplified Nutrient Film Technique (SNFT) was developed for seed potato production. Advantages of SNFT over Deep Flow Technique (DFT) are the easiest for construction with 68% less initial construction cost, ability to harvest more than 400 tubers 100 ft^2 which is 7% superior over DFT.
- An agricultural by products based dry powder formulation of organic fertilizer called Bokashi was identified for potato production.
- Twenty five commercial potato varieties were evaluated. Zina red (25t/ha), Melanto (25.4t/ha), Hermes (20.15 t/ha) and Safari (25.1 t/ha) gave higher yield compared to the check variety Granola (17.3 t/ha) in Maha season. In 2016 Yala, Zina red (26 t/ha), Melanto (25.65 t/ha), Belini (19.86 t/ha), YP-07-296 (18.33 t/ha) and Safari (18.08 t/ha) gave higher yields compared to the check variety Granola (17.3 t/ha).
- Plant Growth Regulators namely Atonic, Ergoston and Green miracle were evaluated under protected and open field conditions to evaluate the performances. None of the products showed significant improvement of plant growth.
- Variety MICH-3 and 60×60 cm plant spacing is selected for Chili-Cabbage intercropping system. Chili variety needs to be transplanted one week before transplanting of cabbage.

Soil Science

- New fertilizer recommendation (N 100 kg/ha, P_2O_5, 50 kg/ha and K_2O, 150 kg /ha) for seed potato production was confirmed after second season trials.
- Intermittent alteration of solution pH (3.5 in 5 and 7 weeks after planting) for G_0 seed tubers production in hydroponic systems was confirmed after second season trials.
- Research and farmer field demonstrations on different fertilizer practices for up country vegetables showed DOA recommendation was the best to maximize the economic returns.
- On-station experiments on selection of best fertilizer practices were completed. Based on economics and environmental aspects, DOA recommendation produced the best results. Ten field demonstrations are ongoing under KOPIA soil fertility program to disseminate the findings.
- Sixteen special commercial fertilizer products were evaluated in green house

(09) and in open field (06). None of the products seems to be superior over DOA recommendations (trials are ongoing for verification).

Horticulture

- Large, attractive and purple colored passion fruit variety (BWPF 1401) was developed. Total yield during first year was 16.3 kg per vine with an average fruit weight of 100.6 g. Fruit length and width were 12.1 cm and 6.7 cm respectively.
- Three strawberry lines were developed (BWS 1501, BWS 1502 and BWS 1603) and yield evaluation trials are being conducted with the check variety "Chandler".
- Fourteen exotic Apple varieties have been evaluated at ARS, Rahangala. More than 50% of the tested varieties showed good growth performance and variety "Red Windsor" produced fruits.
- A promising pear cultivar was identified with different fruit qualities compared to recommended variety, Rahangala selection.

Plant Pathology

- Average yield loss associated due to bean rust and angular leaf spot was estimated as 23.44% for variety Keppetipola Nil.
- Bean rust and angular leaf spot can be minimized by establishing two Maize rows as a border in zig zag pattern.
- Mancozeb 60% + Dimethomorph 9% WP (50 g of product/10 L) and Propineb 70% WP (32 g of product/10 L) can be recommended to control Late blight in Potato.
- Hymexazole 360 g/l, (2 ml/L) as a soil drench or foliar application and 2 ml/kg of seeds as seed treatment can be recommended to control damping off of nursery plants.
- Captan 800 WG, 0.8 g/L as soil drench or foliar application, and 4 g/kg of seeds as seed treatment can be recommended for damping off of nursery plants.

Entomology

- A survey conducted in two farm villages in Badulla district revealed that 65% of farmers use their own knowledge and 40% and 42% farmers use their own knowledge combined with assistance of private companies or pesticide dealers to take pest/disease management decisions. Emamectin benzoate 5% SG (4 g/10 l) can be used to manage cabbage caterpillar complex effectively.
- Korean insect pheromone lures were effective in monitoring cabbage semi looper population under field conditions.
- New miticides, Milbemectin 9.3g/l EC and Pyridaben 20% WP have high efficacy in controlling mites (*Tetranychus* spp.) in poly tunnels when applied in short intervals.
- Neem seed water extract (40 g/l) and marigold plant extract (50 ml/l) were effective in controlling aphids in Rose cultivation.

Floriculture

- There was no difference between application of complete micronutrient mixture (Utah®) and DOA recommended fertilizer for growth of Chrysanthemum.

- Under the program of development of local Gerbera varieties with high commercial value, 63 successful crosses were made. Seeds were obtained from the crosses.
- A growth medium with soil, partially burned paddy husk and compost (8:2:1) was selected as the best medium for vegetative and reproductive growth of miniature roses.
- Under the program of "Technological intervention to improve the production & productivity of flower crops", 156 accessions were collected and four promising accessions were identified for further development as commercial floriculture crops.

Tissue Culture

- Under the study of polyploidy mutation in Spider Gerbera, Colchicine treated plants were acclimatized in poly-tunnel and due for flowering.
- MS + 1mg/l BAP+ 0.3mg/l NAA liquid medium was developed for lily plantlets production in low cost bio reactor system and further improvement under bio reactor system is continuing.
- UV treated plants of Baby's breath and Lisianthus were acclimatized in hardening chamber to study somoclonal variation.

Seed and Planting Material Production

Table 1.2.2.2: Types of planting material produced during 2016

Seed/ Planting material type	Crop	Variety	Quantity
RARDC, Bandarawela			
Breeder	Pole bean	Keppetipola nil	23 kg
	Pole bean	Bandarawela green	27.2 kg
	Bush bean	Sanjaya	21.5 kg
	Carrot	Lanka carrot	0.225 g
Micro propagated	Potato	Granola	3363
Certified or Commercial	Mandarine	Rahangala/ Horana Ehimi 1,2,3, Indu	6400 plants
	Sweet orange	Bibile sweet, Arogya	1200 plants
	Star fruit	local	300 plants
	Passion fruit	Rahangala hybrid	100 plants
	Grapes	Isabella	75 plants
ARS, Rahangala			
Breeder	Pole bean	Lanka butter	19.5 kg
	Bush bean	Top crop	42 kg

Seed/ Planting material type	Crop	Variety	Quantity
Commercial	Orange	Arogya	239 plants
		Bibile sweet	120 plants
		Sisila	77 plants
	Mandarin	Rahangala	628 plants
		Ehimi 1	1210 plants
		Ehimi 2	574 plants
		Ehimi 3	1054 plants
	Pear		2150 plants
	Peach		76 plants
	Guava		274 plants
	Passion fruit		279 plants
	Macadamia		40 plants
	Strawberry		218 plants
	Mango		67 plants
	Grapes		08 plants

Analytical services

- Soil test based fertilizer recommendations were given for 840 farmer samples and 483 research field samples.

Exhibitions/ Field Programs conducted

- A "Potato harvesting day" was held at RARDC, Bandarawela with the participation of researchers, extension officers, seed importing companies and farmers.
- A collaborative evaluation of marketability and farmer preference of commercial potato varieties at harvesting was done in Jaffna with the participation of researchers, extension officer and farmers.
- A field day was conducted at ARS, Rahangala on 2016.07.02 with the presence of Hon. Minister of Agriculture Mr. Duminda Dissanayake, Provincial Minister of Agriculture Mr. Upali Samaraweera, Secretary of the Ministry of Agriculture, Director General of Agriculture and other senior executive officers of the Department of Agriculture.

PLAN FOR 2017

Plant Breeding

- Variety improvement program to develop biotic and abiotic stress tolerant vegetable varieties.
- Commercial vegetable variety evaluation

Agronomy

- Development of suitable crop management strategies for potato.
- Evaluation of selected commercial varieties of potato.

- Development of a technological package for improving yield and quality of Carrot variety Lanka carrot.

Soil Science

- Testing of methodologies to reduced phosphorus application on up country vegetables
- Effects of micro nutrient applications on yield and quality of up country vegetables and soils.

Horticulture

- Development of high yielding, adaptable fruit crop varieties for up country region.

Floriculture

- Identification and development of crop management strategies for roses.
- Improvement of selected wild flower accessions for commercialization.

Plant Protection

- Identification and development of suitable ecofriendly pest and disease management strategies for vegetables grown in the region.

STAFF LIST

RARDC, Bandarawela

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director of Agriculture (Research)	12	10
Administrative Officer	01	01
Agriculture Instructor (Supra)	01	-
Research Assistant (Supra)	01	01
Economist Assistant	01	01
Agriculture Monitoring Officer	02	-
Program Assistant (Agriculture)	09	07
Development Officer	02	01
Agriculture Instructor	05	06
Research Assistant	10	10
Engineering Assistant	01	-
Public Management Assistant	08	11
Technological Assistant (Engineering)	01	-
Technological Assistant (Agricultural Extension)	01	01
Farm Clerk	01	01
Driver	05	04
Tractor Operator	01	01
Store Keeper	01	01

Designation	No. Approved	No. Existing
Mechanic	01	01
Carpenter	01	01
Mason	01	01
Electrician	01	-
Technician	02	01
Research Sub Assistant	03	02
Budder	02	01
Circuit Bungalow Keeper	01	01
Office Employee	01	02
Watcher	10	08
Laborer (Permanent)	35	66
Laborer (Contract)	40	-
Total	**162**	**141**

ARS, Rahangala

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Research)	03	01
Agriculture Instructor	03	02
Research Assistant	03	02
Public Management Assistant	02	02
Technological Assistant (Research)	02	02
Farm Clerk	01	01
Driver	01	01
Tractor Operator	01	01
Research Sub Assistant	01	01
Budder	02	02
Watcher	05	05
Laborer (Permanent)	32	24
Laborer (Contract)	01	01
Total	**57**	**45**

1.2.3 REGIONAL AGRICULTURAL RESEARCH & DEVELOPMENT CENTRE (RARDC) - MAKANDURA

The Regional Agricultural Research and Development Centre (RARDC) at Makandura comes under the purview of HORDI, Gannoruwa caters to the agricultural research and development (R&D) needs of the Gampaha, Kurunegala and Puttalam districts. RARDC is linked to two adaptive research units (ARU) at Tabbowa and Wariyapola and Agriculture Research Station (ARS) at Kalpitiya. While catering the national priorities of the Department of Agriculture (DOA), research Centre also deals with the specific provincial needs. The Centre has established linkages with other institutes and centers of the DOA and outside organizations such as the Faculty of Agriculture and Plantation Management, University of Wayamba, International Water Management Institute (IWMI), Industrial Technology Institute (ITI) etc. to carryout commodity and factor research activities.

The research and development activities of the Center are focused mainly on developing technologies for coconut based cropping system to enhance the productivity of coconut lands. Technologies are developed for the mandated fruits, vegetables, root and tuber, mushrooms, and also for floriculture.

BUDGET

The budgetary allocations and expenditure under different votes are presented in the Table 1.2.3.1.

Table 1.2.3.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
RARDC, Makandura			
Recurrent	3,922,230	3,843,426	98
Capital	2,020,000	2,142,039	106
Projects			
• NARP – Development of IPNS package for vegetables	433,400	472,403	109
• Promotion of organic farming – ANSOFT project	200,000	108,300	54
• Development of correct fertilizer management package – KOPIA project	150,000	132,420	88
• Establishment of Model Mushroom villages – KOPIA project	6,070,209	3,266,565	54
• Promotion of compost production and utilization	5,000,000	3,605,071	72
Use of Entomo -pathogenic fungi to control shoot and fruit borer in Brinjal	208,400	208,250	100

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• Hybrid variety and open pollinated variety Development Program	1,400,000	1,359,480	97
• National Food Production Program	950,000	872,374	92
Total	**20,354,239**	**16,010,328**	**79**
Adaptive Research Station, Kalpitiya			
Recurrent	491,180	449,090	91
Capital Projects	1,863,000	302,195	16
• Hybrid variety and open pollinated variety Development Program	400,000	365,112	91
Total	**2,754,180**	**1,116,397**	**41**
Grand Total	**23,108,419**	**17,126,725**	**74**

PROGRESS

VEGETABLE BREEDING

Pumpkin

- Under the program of population improvement of local pumpkin, around 95% in the purification of 'Vilachchi' line (Spanchi wattakka) was achieved.
- Under the program of purification of local pumpkin around 65% has been completed with regards to Mk1 and Mk2.

Bean

- Forty bean lines have been identified as heat tolerance after screening 125 lines.

Ash pumpkin

- Ash Gourd/Ash Pumpkin (*Benincasa hispida*), progenies were advanced for 5th generation by considering the characters suited for processing industry. The population was purified up to 80 percent.

Capsicum

- In the genetic improvement of Capsicum cultivar "Bullnose" the population was advanced to fifth generation. Colour, shape of the pods and the characteristic feature of "Bullnose" at the blossom end were considered during selections.
- Inter specific hybridization of *Capsicum annuum* and *Capsicum frutescence* was conducted successfully using *Capsicum chinense* Jacq. as the bridging parent for the introgression of virus resistance traits into *Capsicum annuum*.
- Population improvement of *Capsicum chinense* Jacq. "Nai Miris" was performed giving interest to yielding ability and other selected desirable characters. The program was advanced into fifth generation having purity of more than sixty percent.

Luffa

- Luffa lines were evaluated for heat tolerance under poly tunnel, where temperature ranges from 34^0C to 37^0C. Seventeen accessions were selected. During evaluation, reproductive phase coincides with the high temperature months. Some crosses were made to develop heat tolerant lines.
- Under the exotic variety evaluation program a hybrid luffa variety Nadee F_1 was recommended for commercial cultivation.

Okra

- Hundred and fifty five (155) Okra germplasms were collected and plant characterization was completed in 116 accessions. All the accessions (155) were evaluated under drought condition. Among them two PGRC lines, 7 exotic hybrids, and two local farmer selections were selected for future breeding program considering their high yielding ability and tolerance to yellow vein mosaic virus under drought condition.
- Plant architecture modification by removing apical buds at 2 weeks age, 3 weeks age and 4 weeks age was done using variety Haritha and popular hybrid variety Shakshi. Branching gave a significant yield advantage and trial will be continued for second season.
- Under the exotic variety evaluation program a hybrid Okra variety OKH 18 was recommended for commercial cultivation.

ROOT AND TUBER CROPS

- Plant Growth Regulators and other physical methods were used to break the dormancy in *Dioscorea* spp. 'Rajala' under laboratory conditions. Dark condition and more than 85% relative humidity helped to break the dormancy of tubers earlier.
- Experiments were conducted to identify the conditions to be provided to harvest tuber sizes that fit for export market for *Dioscorea* variety Rajala. Results revealed that mother tuber pieces of 50g to 100g gave the standard weight for the export market (1 kg-1.5 kg).

HORTICULTURE & AGRONOMY

- Off seasonal flower induction for Dragon fruit can be practiced through supplying of artificial light. Three hours artificial light from 7 p.m. to 10 p.m. is enough to obtain maximum off seasonal production. Light supply should start in November and continue up to January. During this period light supply should be done for 18 days followed by a three day break. There after 12 days light supply can be practiced with a break for 3 days from February to April. Proper canopy management is needed for continuous production, since newly develop branches produced fruits during ordinary season. Therefore, plants need to be pruned during November to induce flower buds during end of April. At the end of May, old branches that are unproductive and mutually shading should be removed for year round production.

FLORICULTURE & TISSUE CULTURE

- Anthurium germplasm collection was increased up to 74 and 7 plants were selected from hybridization program for further evaluation.
- Mutation induction of Orchids was started and number of varieties in germplasm collection was increased up to 40.
- Marigold improvement program was initiated and F_2 generation has been established in the field.
- Varietal improvement of African violet and Begonia by *in-vitro* induce mutation using Colchicines has been started and *in-vitro* cultures are at rooting stage.
- Ten gemplasm of Jasmine established in the field and evaluations continuing.

SOIL MICROBIOLOGY

- Assessment of N fixing bacteria with different organic fertilizer supplements were tested for selected rice varieties such as Bg 358, 'Suwandal' and 'Kalu Heenati'. Different microbial isolations were prepared for development of bio fertilizer and quality improvement of compost.

SOIL & PLANT NUTRITION

- Field experiments revealed that use of compost 100% and Half Burnt Paddy Husk (HBPH) as a soil amendment and compost extract as a foliar application can be used to 25 -50 % cut down of chemical fertilizer for Okra, Red onion and Brinjal.

ENTOMOLOGY

- Use of Entomo-pathogenic fungi to control shoot and fruit borer in Brinjal (*Solanum melongena* L. – *Leucinodes orbonalis* (Guen.) is continued. Seventy five samples of infected cadavers of shoot and fruit borer were collected from Kurunegala, Gampaha and Kegalle areas in organically cultivated fields. The fungus was extracted. Mass culturing methods will be developed for lab experiments.
- A mass trap to be used with the pheromone is necessary to be introduced for the control of sweet potato weevil. It was found that white stick trap as suitable over yellow stick trap and greasy paper.
- *Erionota thrax* (Linnaeus, 1767) was identified as a new quarantine pest in Banana. In this experiment**,** biology of the pest and the appropriate control measures were identified. Some birds (Crow, 'Kauda') and squirrels have been identified as natural predators. In severe infestations, Chlorantraniliprole + Thimethoxam 40% WG (Vertako) 2.5 g/10 l can be used as a temporary remedy to manage the pest.

PLANT PATHOLOGY & MUSHROOM

- Log cultivation and bag cultivation practices for *Ganoderma lucidum* (Reshi mushroom) were successfully tested. Analyzing of important properties of *Ganoderma lucidum* was started.
- Three mushroom germplasm were collected and mother culture production and spawn production were completed.

- Cultivation of exotic mushroom varieties suitable under low temperature environment. Preliminary experiments were conducted and successful results were obtained for growing low temperature mushrooms such as Shitake and Eryngii.
- Re-identification of causal agent/s and management of. Isolation and identification causal agents of Leaf Twister Disease (Disco) of red onion in Kalipitiya peninsula were completed. Field experiments have been planned to identify control measures.
- Ninety present of the constructions of Model Mushroom Community Centre at Munamaldeniya was completed. A mushroom farmer society was formed as "Arunalu Bimmal Society" with the help of Provincial Department of Agriculture of the North Western Province.

DEVELOPMENTS

- Declared opened the new Auditorium of RARDC, Makandura.

SEED & PLANTING MATERIAL PRODUCTION

Table 1.2.3.2: Seed & Planting Material production during 2016

Crop	Production	No. of plants sold
Anthurium	1300	600
Banana	5000	free issued
Cassava	1200 m	400 m
Dragon Fruit	3200	2450
Mushroom seeds	350 packs	277 packs
Pineapple	8000	free issued
Pumpkin – improved line	4.5kg	
Hybrid Brinjal parental line	500g	
Nai miris	300 pods	300 pods

TECHNOLOGY DISSEMINATION

Table 1.2.3.3: Technology dissemination during 2016

Topic of the program	Leaflets	Field days / Workshops	Soil, compost, water sample testing	Reports	Exhibitions
Compost					02
Organic Farming	700	04			
Soil & compost analysis			817	372	
Mushroom	2,000	02			
Pathology	50				
Dragon fruit	200	01			
Entomology	2,000				
Pineapple	60	01			

Training programs

Table 1.2.3.4: Training programs conducted during 2016

Topic of the program	No of Programs	No of Participants
Dragon Fruit	10	350
Entomology	08	250
Floriculture	08	840
Home garden	15	680
Meteorology	05	200
Mushroom	23	1232
Pineapples	25	1320
Root & Tuber	08	250
Soil & organic farming	10	598
Vegetable	12	1150
Banana	05	300

Advisory Services

Table 1.2.3.5: Advisory services provided during 2016

Field	No. of Advisory during the year 2016
Compost	210
Mushroom	120
Pineapples	420
Floriculture	160
Home garden	188
Organic agriculture	45
Root & Tuber	38
Dragon Fruit	75
Banana	30
Pathology	67
Entomology	205
Vegetable	152

- A workshop on Mushroom was conducted at District Secretary Office, Kegalle.
- Mushroom field day was conducted by the IFARD, Monaragala.
- One day Mushroom workshop was conducted for island wide extension staff and mushroom growers.
- Mushroom bag sterilizer (boiler) was introduced for efficient and efficient sterilization of mushroom growing bags.

Radio and TV programs

- TV program on 'Nai miris ha kochchi wagawa', 'Govi Bimata Arunalu' in 'Jathika Rupavahini' by K.N. Kannangara.
- TV program on introduction of Makandura white mushroom for cultivation (In Sinhala), 'Govi Bimata Arunalu' in 'Jathika Rupavahini' by P. Rajapaksha.
- Radio program, 'Gewaththa' agricultural program in 'Wayamba Handa' on the topic of Mushroom cultivation by P. Rajapaksha.
- Radio program, 'Gewaththa' agricultural program in 'Wayaba Handa' on the topics of correct soil fertility management, Compost production, integrated plant

nutrient management, Organic farming by D.M.P.S Dissanayake.

PLAN FOR 2017

- Crop improvement of vegetables with special reference to Pumpkin, Luffa, Capsicum, Bean and Okra.
- Seed multiplication of improved 'Spanchy pumpkin'.
- Identification of ideal spacing for Pumpkin cultivation to get maximum profit.
- Development of suitable agronomic practices to promote yam (*Dioscorea* spp.) under coconut.
- Crop improvement of Anthurium, Orchids and Jasmine.
- Use of Entomo-pathogenic fungi to control shoot and fruit borer in Brinjal (*Solanum melongena* L.).
- Identification of methods to manage sweet potato weevil.
- Management of leaf twister disease (Disco) of red Onion in Kalipitiya.

STAFF LIST

RARDC, Makandura

Designation	No. Approved	No. Existing
Deputy Director of Agriculture (Research)	01	01
Assistant Director of Agriculture (Research)	12	06
Assistant Director of Agriculture (Economics)	01	-
Administrative Officer	01	01
Agriculture Instructor (Special)	01	-
Economist Assistant	01	01
Agriculture Monitoring Officer	05	02
Program Assistant (Agriculture)	06	01
Development Officer	03	04
Farm Manager	-	01
Agriculture Instructor	06	13
Research Assistant	10	11
Public Management Assistant	08	10
Technological Assistant	04	05
Farm Clerk	01	02
Driver	04	04
Tractor Operator	02	02
Storeman	01	01
Carpenter	01	-
Mason	01	-
Electrician	01	-
Mechanic	01	01

Designation	No. Approved	No. Existing
Technician	02	01
Research Sub Assistant	03	01
Circuit Bungalow Keeper	01	01
Office Employee	01	01
Watchers	05	05
Unskilled Laborer (Grade I)	63	16
Unskilled Laborer (Grade III)		38
Sanitary Laborer	01	01
Laborer (Contract)	01	09
Total	**148**	**139**

Agriculture Research Station, Kalpitiya

Designation	No. Existing
Assistant Director of Agriculture (Research)	01
Farm Manager	01
Agriculture Instructor	01
Public Management Assistant	01
Technological Assistant	04
Driver	01
Tractor Operator	01
Mechanic	01
Watcher	02
Unskilled Laborer (Grade III)	12
Laborer (Contract)	01
Total	**28**

Adaptive Research Unit, Thabbowa

Designation	No. Existing
Farm Manager	01
Technological Assistant	01
Watcher	01
Unskilled Laborer (Grade III)	05
Total	**09**

Adaptive Research Unit, Wariyapola

Designation	No. Existing
Development Officer	01
Farm Manager	01
Agriculture Instructor	01
Research Assistant	01
Watcher	02
Laborer (Contract)	05
Total	**14**

1.2.4 AGRICULTURE RESEARCH AND DEVELOPMENT CENTRE (ARDC) - SITA ELIYA

Agriculture Research and Development Centre, Sita Eliya comes under the purview of Horticultural Crops Research and Development Institute, Gannoruwa. Potato, temperate vegetables, fruits and some floricultural crops are the commodity research focus of this station. Crop improvement program of the station includes varietal development, introduction and selection of high yielding varieties. Crop productivity is enhanced through development of improved agronomic packages, use of good agricultural practices for the management of pest, disease and nutrients. The Centre is responsible for conducting national programs to uplift quality and amount of seed potato, planting materials of strawberry and some ornamentals.

BUDGET

Table 1.2.4.1: Annual Budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	2,558,808	2,248,529	88
Capital	2,588,647	2,410,692	93
Projects			
• Potato Production Program 2016-2018	59,200,000	55,104,237	93
• Potato Seed Production	6,000,000	6,550,727	109
• Soil Fertility Management-Vegetables (KOPIA)	250,000	255,518	102
• Development of F_1 hybrid and open pollinated varieties and production of basic seeds	1,000,000	1,002,773	100
• Mushroom development project (KOPIA)	372,000	366,708	99
• Technological interventions to improve production and productivity of selected vegetables	100,000	94,990	95
• AFACI	500,000	479,642	96
• Development of temperate fruit sector in Sri Lanka	700,000	668,023	95
Total	**73,269,455**	**69,181,841**	**94**

PROGRESS

RESEARCH

Agronomy

- A study was conducted to evaluate the effects of different chemicals on sprouting of Potato pre basic seeds of variety Granola. It was found that Gibberelic acid ($GA_{3)}$ and Carbon disulfide (CS_2) were appropriate chemicals for dormancy breaking, at the rate of 50 ppm and 15 mlm^{-3} respectively.
- The field performances of different sizes of pre basic seeds of potato variety-Granola were tested under UCWZ conditions. Tubers larger than 10 mm produced significantly higher yield.
- A study was conducted to select appropriate propagule of varieties Granola, Arnova, Red La Soda for aeroponic system. According to the results *in-vitro* plants gave higher yield than plants developed from mini tubers.
- Performance of cut seed potato tubers of different varieties was evaluated under UCWZ conditions. Large size tubers of varieties, Desiree, Arnova, Red La Soda & Connect can be cut into pieces of 60 g and planted without any yield reduction compared to whole tubers weighing 60g.
- Experiment was conducted to find out the most appropriate planting density for Cabbage, Chinese cabbage, Broccoli and Cauliflower. This study will be continued in next seasons.

Plant Breeding

Potato

- Selected fourteen parental lines were established in poly tunnel and nine crosses were made.
- Six locally developed potato lines were evaluated under MYT. Four lines produced significantly higher yield over control variety. Study will be repeated to identify lines for NCVT.
- Promising heat tolerant potato line (YP-07-611) was established under large scale VAT in Puttalam and Jaffna farmer fields to give recommendations for the LCDZ.
- Thirty potato varieties were established in Kalpitiya and Thirunelveli research stations to select suitable heat tolerant potato varieties for LCDZ.
- Fifteen CIP lines were evaluated under PYT. Eleven lines produced significantly higher yield over control variety. Study will be repeated to identify lines for MYT.
- Twenty Two exotic potato varieties were evaluated for yield, and Late Blight disease tolerance/resistance. Eight high yielding potato varieties (Arizona, Zina Red, Constance, KO-04-1945, Safari, YP-07-296, Melanto and faluka) with less disease incidence were identified for commercial cultivation.
- Thirty eight exotic potato varieties were evaluated for yield and their adaptability. Study will be repeated to identify varieties for commercial cultivation.

Vegetable

- Evaluated two Beet Root, one Broccoli, ten Cabbage, fifteen Carrot, three Cauliflower, one Chinese Cabbage, one Knol-khol and

one Pac choi variety. Two Cabbage varieties, Strong Boy and J-Power, two Carrot varieties, Rex and Vanquish-02, were identified based on yield, maturity, less pest and disease incidences and consumer acceptability for large scale demonstration under UCWZ conditions.

Tissue Culture

- A method was developed for *in-vitro* multiplication of Carnation. The method includes three steps. Step one callus induction using MS medium supplemented with 2.0 mg/l 2,4-D + 1.0 mg/l BAP, Step two shoot induction using MS medium supplemented with 1mg/l BAP 0.5mg/l NAA and step three root induction using MS medium supplemented with 0.5 mg/l NAA .
- Two root induction media were tested to induce rooting of *in-vitro* shoots of Pears. None of the tested media were effective on rooting. Further experiments will be carried out.
- Somatic embryogenesis ability of Potato was tested using variety Granola. MS+ 2 mg/l 2,4-D was the suitable callus induction medium and MS+2.25 mg/l BAP + 5 mg/l Zeatin + 5 mg/l GA_3 was the suitable embryogenic medium for those calli. Those two media together were able to produce pre embryos from leaf explants, but no further development was observed due to calli browning.

Entomology

- Efficacy of Metaldehyde 5% pellet was tested for the management of slugs and snails and found to be effective at the rate of 4 kg/ha.
- Azadiractine 1% EC and Buprofezine 40% SC were recommended at the rate of 10 ml/10 l and 15 ml/10 l for the control of leaf miner in potato.
- Azadiractine 5% EC was recommended at the rate of 10 ml/10 l for the control of thrips and whiteflies in Potato.
- Spinosad 2.5 SC and Emamectine benzoate 50 g/kg SG were tested for reregistration . It was found to be effective for the management of diamond back moth at the rate of 10 ml/10 l and 4 g/10 l.
- A study was conducted to identify the influence of climatic factors on population dynamics of sucking pests during Yala 2016. This study will be continued in the coming seasons as well.
- An experiment was carried out to assess the yield loss of Potato due to sucking pest (Aphids, Thrips, and Whitefly) during Yala 2016. This study will be continued.

Pathology

- 5 g/l Mancozeb 60% + Mandipropamid 5% WG performed better than Mancozeb 68% + Metalaxyl 4% (2.50 g/l) in controlling late blight of Potato.
- Efficacy of Mancozeb 68% + Metalaxyl 4 % @ 2.5 g/l was tested against late blight of Potato for re-registration. The performance of tested product was similar with control.
- Thirty eight new commercial potato varieties were screened against late blight under field conditions. Variety “Alluette” showed resistance against late blight.

- Eleven new Potato breeding lines were screened against late blight under field conditions. New line 99-02 showed moderate tolerance to late blight.
- Epidemiological studies were conducted on powdery scab of Potato in Yala season in Nuwara Eliya with 6 varieties. All the varieties were affected with Powdery scab. This study will be continued.
- Among eighteen bacterial isolates obtained from soil, one *Bacillus* spp. & one *Pseudomonas* spp. had bio controlling ability against *Ervinia carotovora* (causal agent of Potato soft rot) under *in-vitro* conditions.

Soil Science

- Studies were conducted to update the current fertilizer recommendations of Carrot and Cabbage. According to the results of the experiments, identified rates were N - 150 kg/ha, P_2O_5 - 100 kg/ha, K_2O – 100 kg/ha for Carrot and N -100 kg/ha, P_2O_5 – 100 kg/ha, K_2O – 150 kg/ha for Cabbage.
- An experiment was conducted to study the response of vegetable crops in a cropping sequence to N,P,K fertilizers in UCWZ. Experiments were completed for two seasons with Potato and Carrot and the experiment for next season will be carriedout with Cabbage.
- A study was conducted to study the requirement of P in high P soils. of Experiments were completed for two seasons with Potato and Carrot and both crops gave good yields without the application of phosphorus. It is planned to continue this experiment for two more seasons.

Mushroom

- An experiment was conducted to develop appropriate technology for king Oyster (*Pleurotus eryngi*) cultivation. Substrate with "Mara" saw dust gave higher yield.
- An experiment was conducted to develop appropriate technology for Shiitake (*Lentinula edodus*) cultivation. All the treatments developed to "popping" stage within 70 – 90 days.
- A study was conducted to develop low cost substrate for American Oyster (*Pleurotus ostreatus*) using locally available tea refuse. 50% tea refuse + 50% saw dust gave higher yield.

Fruits

- Eight Pears varieties are being evaluated and "Nuwara Eliya selection" performed well under UCWZ conditions.

DEVELOPMENT ACTIVITIES

Seed and Planting material production

Table 1.2.4.2: Seed and Planting material production during 2016

Crop	Variety	Type	Quantity
Potato		Pre basic seeds (G_0)	196,323
	Granola	*in-vitro* plantlets	12,105
	Arnova	*in-vitro* plantlets	162
	Red Lasoda	*in-vitro* plantlets	156
		in-vitro micro tubers	1,954

Crop	Variety	Type	Quantity
Strawberry		*in-vitro* plantlets	3,463
Baby's breath		*in-vitro* plantlets	12,118
Madonna lily		*in-vitro* plantlets	375
Gerbera		*in-vitro* plantlets	73
Chrysanthemum		*in-vitro* plantlets	2,506
Statice		*in-vitro* plantlets	29
Limonium		*in-vitro* plantlets	112

SERVICES

Table 1.2.4.3: Analytical services provided during the year 2016

Type	Purpose	No.
Soil	Potato Cyst Nematode	848
Soil	Bacterial Wilt	860
Soil	pH	852
Soil	EC	651
Soil	Phosphorus	569
Soil	Potassium	564
Soil	Organic Matter	540

Pest and Disease diagnosis service

- Disease identification and recommendations were provided for 33 plant samples submitted by the farmers.
- 214 number of parasites of leaf minor (*Diglypus isae*) were distributed among poly tunnels.

Technology Dissemination

- Participated at research and extension dialogs organized by Provincial Department of Agriculture at Hanguranketha, Walapane, Kothmale and Nuwara Eliya.
- One field day was conducted at the Agriculture Research and Development Center.
- Work shop was conducted on "Quality Seed Potato Production" under KOPIA seed Potato project.
- Participated in 'April Blooms 2016' organized by the Municipal Council of Nuwara Eliya and awarded with the first place for Fence & Hedges, Lawn and Flower garden. For the cut flower competition thirteen first places, twelve second places and seven third places and second for best cut flower collection.

TV Programs

- New Potato varieties
- Vegetable production & Floriculture

Radio programs

- Off season cultivation of Potato

Books

- One book was published on "Quality Seed Potato Production"

Trainings offered

- Two B.Sc. undergraduate students completed their final year specialization projects related to Tissue Culture and Agronomy.

- Two students from National Apprentice and Industrial Training Authority were trained for their industrial training.
- 346 university students, 569 Agriculture School students, 2,086 School students, 393 Agriculture related officers and 233 Farmers were trained on Potato cultivation, Potato seed production, tissue culture, floriculture, strawberry cultivation, protected culture, pest and disease management, Up country vegetable cultivation, home gardening and soil conservation.

PLAN FOR 2017

- Development of improved agronomic practices to increase the productivity of vegetable crops under UCWZ conditions.
- Development and improvement of technology for quality seed potato production.
- Development, identification, improvement and selection of suitable Potato varities for local cultivation.
- Develop technologies for environmental friendly pest and disease management methods for UCWZ crops.
- Selection of suitable temperate vegetable varities for UCWZ cultivation.
- Development and improvement of adaptable in-*vitro* propagation techniques of seed potato, temperate fruits and flower crop production.
- Development and identification of environment friendly fertilizer management practices for UCWZ cropping systems.
- Development and improvement of technology for new mushroom types suitable to UCWZ.

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director (Research)	01	01
Assistant Director (Research)	09	04
Administrative Officer	01	-
Agriculture Instructor(Special Grade)	01	-
Research Assistant (Special Grade)	01	-
Agriculture Monitoring Officer	-	01
Program Assistant (Agriculture)	03	-
Development Officer	02	-
Agriculture Instructor	03	03
Research Assistant	07	03
Public Management Assistant	03	03
Technological Assistant	06	06
Farm Clerk	01	-
Driver	03	03
Tractor Operator	01	01

Designation	No Approved	No. Existing
Storeman	01	-
Electrician	01	-
Research Sub Assistant	03	-
Budder	02	02
Office Employee	01	01
Watcher	06	06
Laborer (Permanent)	44	38
Laborer (Contract)	03	03
Total	**102**	**75**

1.2.5 AGRICULTURE RESEARCH STATION (ARS) - TELIJJAWILA

Agriculture Research Station, Telijjawila, function under the purview of HORDI, Gannoruwa. Research and Development activities of the Research Station are mainly focused on development of technologies pertaining to productivity improvement of vegetables, root and tuber crops, fruits and mushrooms. In addition emphasis was given to the production and distribution of planting materials, training and education of extension staff and farmers to ensure productivity of the Southern region of Sri Lanka.

BUDGET

Table 1.2.5.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	1,605,915	1,363,880	85
Capital	1,083,000	1,032,524	95
Projects			
• NARP - *In-vitro* mutagenesis of banana for *Fusarium* wilt (*Fusarium oxysporium* f.sp. *cubense* (Foc)) resistance/ tolerance	590,000	589,151	100
• NARP - Vegetable cowpea project	100,000	91,000	91
• KOPIA Mushroom project	372,000	368,999	99
• Hybrid seed production program	700,000	698,708	100
• National food production program	100,000	99,941	100
Total	**4,550,915**	**4,244,203**	**93**

PROGRESS

RESEARCH

PLANT BREEDING

Chili

- Eight traditional Chilli lines (*Capsicum chinense*) identified were purified and distributed among farmers in Southern and Western provinces.

Yard long bean/ Vegetable cowpea

- Thirty Vegetable cowpea germplasm were evaluated and two basal rot tolerant lines were identified. These lines will be utilized for the future breeding program. NCVT Yard long bean trial was conducted and 'Gannoruwa hawari' was found to be suitable for this region.

Brinjal

- NCVT Brinjal (Hybrid) program was conducted and EGH 5 was identified as the best for this area. Hundred grams of seeds of Brinjal parental line 8805 was produced.

Root and Tuber crops

- Twenty different 'Innala' lines were evaluated and 16 lines were submitted to PGRC for conservation. Four lines were submitted to Provincial Department of Agriculture (Western) for farmer's field cultivation.
- Purple yams (Raja ala) and 'Dandila' were found suitable for cultivation in Weligama coconut wilt affected fields.

TISSUE CULTURE AND BIOTECHNOLOGY

In-vitro mutagenesis of banana for Fusarium wilt (*Fusarium oxysporium* f.sp. *cubense* (*Foc*)) resistance/ tolerance

1,190 Shoot tips of banana variety 'Agra' were treated with 1.00-1.2% Ethylmetane Sulphonate (EMS) + 2% Dimethylsulfoxide (DMSO) along with 100 Nos. of shoot tips as control. 0.25mM of Fusaric acid was selected to screen the shoot tips *in-vitro* based on the estimated LD_{50} values on explant survival and growth parameters. Experiment will be continued for screening of plantlets for Panama disease.

Tissue culture

- Micro propagation of 'Innala' (*Solenastemon rotundifolius*) was found feasible and cost effective due to high multiplication rate. Experiment on *in-vitro* tuberization of *Dioscorea alata* is in progress.

Floriculture

Development of new Dendrobium varieties

- Aloe extract showed significant effect on growth of Dendrobium orchids while GA_3 and BAP did not show any impact. Dendrobium orchid shoot tips were subjected to chemical mutation and irradiation. Mutated plants will be evaluated.

PLANT PATHOLOGY AND MUSHROOM

- Mother spawns of indigenous mushroom, 'Urupaha' was successfully prepared to initiate the cultivation further to the identification of malt extract agar as the best culture media to maintain the mycelia cultures. Poor and scanty mycelia growth was observed in king oyster mushroom when cultivated at WM_{1a} zone in Matara District. Spent oyster mushroom substrate (SMS) was found effective in the management of root knot nematodes *(Meloidogyne* spp.) in 'Gotukola' cultivation when used at 1:4 ratio (SMS:soil) in a pot experiment. Further studies are being continued at field level. Neem oil was found superior in comparison to Citronella and Cinnamon oil in the management of Staphylinid beetles (*Gyrophanena spp*.) infecting oyster mushrooms.

SOIL SCIENCE AND AGRONOMY

- Pineapple, leafy vegetables (Kathuru murunga, Gotu kola and Mukunuwenna), vegetable jute, Anoda and grafted Anoda were identified as suitable for cultivation in 'Sorjan' beds in Nilwala area.
- Soil chemical parameters (EC and pH) of 'Sorjan' beds in Nilwala area improved naturally after two years.
- To achieve higher economical yields, early planting (July to September) of 'Innala' was identified as suitable while late planting (end of October) was suitable for planting material production and to minimize the nematode infection.
- The best and low cost trellising method was identified for *Dioscorea*.
- It was found feasible to cultivate *Dioscorea* in contour drains (in slopy lands).
- 'Katu ala' could be propagated using true seeds.

DEVELOPMENT ACTIVITIES

- A new poly tunnel (1000ft^2) was constructed under Hybrid seed production program.
- Protective fence was established in the research area of root and tuber crops and leafy vegetables.

TECHNOLOGY DISSEMINATION

Table 1.2.5.2: Technology dissemination during 2016

Training program	Project/ Participants
Training on Mushroom production	25 classes 810 participants
Training on Spawn production	24 participants
Orchid and Anthurium cultivation	20 classes/ 375participants
Home gardening	100 participants
IPM techniques	100 participants
Pre seasonal training (Root and tuber crops cultivation and 'Thumba karawila' cultivation)	4 classes
Pre seasonal training on Orchid cultivation and planting material production	2 classes
Pre seasonal training (Mushroom production)	5 classes
Students training (NVQ - Level 5)	13 students
Training on Advanced level Bio system technology	300 students

PLANTING MATERIAL PRODUCTION

Table 1.2.5.3: Production of seeds and planting material

Seed/Planting Material type	Crop	Variety	Quantity
Stems	Manioc	Different varieties	25 kg
Tissue cultured plants	Banana	Different varieties	2,130
	Orchid	Dendrobium community pots (50 plants/ pot)	130
Spawn	Mushroom	American Oyster	3000 pkts (200g)
Seeds	Brinjal	8,805 parental line	100 g
	Yard long bean	Gannoruwa Hawari	3 kg
		A9	1.5 kg
	Luffa	Gannoruwa Ari	1 kg

PLAN FOR 2017

- Crop improvement in Vegetable Cowpea and 'Innala'.
- Tuberaization studies of 'Innala' (*Solenastemon rotundifolius*).
- Molecular confirmation of resistance/ tolerance of 'Kolikuttu' banana to *Fusarium* wilt.
- Alternative growth substrate for the cultivation of *Volveriella volvacea* (paddy straw mushroom).
- Development and promotion of mushroom cultivation technology.
- Micro tuber induction of purple yams (*Dioscorea alata*).
- Agronomic and multiplication studies on tuber crops.
- Development of strategies to increase farming in the Nilwala region.

STAFF LIST

Designation	No. Existing
Assistant Director of Agriculture (Research) In Charge	01
Assistant Director of Agriculture (Research)	04
Assistant Director of Agriculture (Development)	02
Program Assistant (Agriculture)	03
Development Officer	03
Agriculture Instructor	06
Research Assistant	03

Designation	No. Existing
Research Sub Assistant	02
Public Management Assistant	02
Technological Assistant	02
Farm Clerk	02
Driver	02
Tractor Operator	01
Storeman	01
Office Employee	01
Watcher	06
Laborer	30
Laborer (Contract)	01
Total	**72**

1.2.6 AGRICULTURE RESEARCH STATION (ARS) - GIRANDURUKOTTE

The Agriculture Research Station, Girandurukotte, is mainly responsible for the generation of necessary agriculture technologies to improve farm productivity while sustaining the agriculture environment and ecosystem in Mahaweli System C. It also engages in specific agriculture development activities which have been considered as nationally important. Presently it functions under the administrative control of Horticultural Crop Research & Development Institute, Gannoruwa.

In addition to the research and development program the research station acts as the main agriculture related training provider to officers, farmers, school children and relevant personnel of other organizations in the region.

BUDGET

Table 1.2.6.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	3,642,997	3,042,560	84
Capital	3,231,543	2,968,815	92
Projects			
• Development of F1 Hybrids and Open Pollinated Varieties and Production of Basic Seeds	789,400	516,032	65
• Conservation and Characterization of selected fruit germplasm using molecular methods for establishment of Biodiversity garden of tropical fruits at Girandurukotte	1,400,000	1,254,693	90
• Technological Interventions to improve production and productivity of selected vegetables	170,000	128,093	75
Total	**9,233,940**	**7,910,193**	**86**

PROGRESS

RESEARCH

Vegetables

EGH 9 line of Brinjal, 32-4 line of Mae and MICH-1 line of Chilli performed well in the region.

Evaluation of Elabatu (*Solanam incanum*)

Thirty two locally collected lines were purified and seeds were produced. Well purified eight lines were tested under first preliminary yield trial (PYT).

Development of Tomato inbred line

Promising three segregated line were identified during generation advancement. Established and purified $_{F4}$ and F_5 generation levels.

1-MCP on fiber formation of Okra

Studies conducted showed that 1-MCP fumigation as a favorable method for maintaining quality, extending shelf life and slow down the fibre formation in Okra.

Activated carbon sources on ripening quality and shelf life of Tomato

Positive results were observed with activated carbon materials. Data analysis is in progress.

Purification of traditional vegetable variety

Purification of 'Mahaweli' Mae and red Okra cultivars were commenced. Three morphologically different Mae lines were identified and seeds were collected for further improvement. Seven different red Okra lines were identified.

Fruits

Evaluation and multiplication of *Annona muricata*

Morphological characterization was completed. DNA extraction of these accessions was completed and propagation of selected plants was started.

Evaluation, characterization and multiplication of exotic mango germplasm

Morphological characterization was completed for 75% of population. Twenty eight fruits samples were analyzed and accessions were selected.

Bio diversity garden

During 2016, following plants were field established *Annona muricata* 200, Pomegranate 200, Bibile Sweet Orange 100, Horana Ehimi Orange 1,375, 'Jambu' 50, Wood apple 50, Belli 50.

Rice

National coordinated varietal testing trials were conducted for 2 ½, 3 and 3 ½ months varieties. Bg 12-1666 gave the highest yield of 6.5 t/ha from the 2 ½ months age class. From 3 months age class, At 13-2715 performed best in dry season giving 8.5 t/ha. At 3791 was the best variety in 3 ½ months age class which performed a yield of 8.6 t/ha.

DEVELOPMENT

Infrastructure development

During the period under review the office building was renovated. A new wire fence of 1,000 m was established at the office premises.

Technology Dissemination

Seven awareness programs were conducted for more than 375 farmers and government officers. Three famer and officer training programs and crop clinic programs were conducted.

Seed and planting material Production

Following quantities of seeds and planting materials were produced by the research station during the period under review.

Table 1.2.6.2: Seed and planting material production during 2016

Seed/ Planting material	Crop	Variety	Quantity (kg)
Breeder	Cucumber	Kalpitiya white	1.9
	Luffa	Gannoruwa Ari	6.0
Parental lines	Pumpkin	Padma	2.3
	Brinjal	EGH190	675

PLAN FOR 2017

- Crop improvement of vegetables.
- Coordinated varietal trials of rice.
- Fertilizer recommendation trials for Gherkin cultivation.
- Evaluation of exotic Mango germplsm.
- Evaluation of Annona (*Annona muricata* L.) germplasm
- Breeder seed production program of Tomato.
- Evaluation of exotic and local Citrus accessions for their desirable characters.
- Screening of local Brinjal germplasm for shoot and pod borer resistance.

STAFF LIST

Designation	No. Existing
Deputy Director of Agriculture (Research)	01
Assistant Director of Agriculture (Agric. Research)	02
Agriculture Instructor	01
Research Assistant	07
Technological Assistant	03
Farm Clerk	01
Driver	01
Tractor Operator	01
Storeman	01
Welder	01
Budder	01
Circuit Bungalow Keeper	01
Watcher	05
Unskilled Laborer (Grade III)	39
Laborer (Contract)	12
Total	**77**

1.3 FRUIT RESEARCH AND DEVELOPMENT INSTITUTE (FRDI) - HORANA

The Fruit Research and Development Institute (FRDI), Horana has been contributing to develop technology for enhancing the productivity and quality of fruit crops. The FRDI gives a special emphasis on the crops adapted to the Low Country Wet Zone (LCWZ) while giving leadership for satellite research stations & centers, units and farms. The present research programs are focused on both national and regional aspects, especially variety development with high yield & good quality, improved crop management practices, crop protection, plant nutrition, organic fruit culture, food technology, plant propagation techniques and nursery management for production of high quality planting materials.

Establishment of fruit villages and bio diversity gardens are major development programs under this institute.

BUDGET

Table 1.3.1: Annual budget - 2016 (Without Eraminigolla, Ambathenna, Gannoruwa & Homagama)

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	246,850,780	246,188,669	100
Capital	10,135,958	8,585,272	85
Projects			
• Fruit Village development project • (Vote no. 285-2-2-9-2502)	15,000,000	12,123,127	81
• Bio diversity Project	25,000,000	19,309,000	77
• National Food Production program – Fruit village development project (Vote No: 118-2-3-20-2502 C-15)	194,000,000	128,200,000	66
• National Food Production program – Research projects (118-2-3-20-2502 (II)			
• Development of package of practices for minimizing post harvest losses of selected fruit crops	3,000,000	2,379,490	79
• Reduce the fertilizer use through site specific fertilizer recommendation for Papaya, Passion fruit & other fruit crops	200,000	106,979	53

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• Development of Panama resistant / tolerant mutants through tissue culture	1,000,000	1,085,123	109
• Development of invertor techniques for healthy planting material production of Mandarin	500,000	383,967	77
• Enhancement of the productivity of fruit crops by managing major pest problems	1,500,000	1,359,771	91
• Breeding Project (FR-FRI-285-2-2-8-2502)			
• Development of seed / less seeded Guava variety	400,000	615,130	154
• Development of Annona varieties with high and good quality.	900,000	368,831	41
• Development of high yielding good quality Citrus (Sweet orange & mandarin) through hybridization.	900,000	364,202	40
• Development of high yielding good quality Durian varieties through hybridization.	1,100,000	395,984	36
• Development of new hybrids of Mango	200,000	56,044	28
• Hybrid seed production of Papaya	600,000.00	261,734	44
• Development of new hybrids through interspecific hybridization within a family (Passifloraceae, Annonaceae & Bromeliaceae)	100,000	24,800	25
• Selection of high yielding and good quality Mango varieties adaptable for different Agro ecological Zones	1,000,000	253,640	25
• NARP Project – FR-FRI-285-2-2-5-2502 • Development of high yielding good quality Papaya varieties	1,019,000	838,992	82
• Selection of high yielding and good quality Mango varieties from existing germplasm	1,000,000	414,292	41
• Maintenance of local and exotic germplasm orchard	1,850,000	743,795	40
• Effect of foliar feeding of selected nutrients on growth, yield and fruit quality of Papaya	401,900	458,369	114

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• Development of Passion fruit varieties through hybridization and composite seed production	440,500	421,045	96
• Regulation of fruit set and post-harvest life and investigation of the variability of bioactive compounds in selected accessions of Annona *muricata* L. accessions found in Sri Lanka.	420,000	295,149	70
• Improvement of yield and quality of Banana	619,800	432,416	70
• Characterization of flowering behavior and floral biology of Beli (*Aegle marmelos*), Wax apple (*Syzygium samarangense*), Ceylon olive (*Elaeocarpus serratus*), Soursop *(Annona muricata*), Sapodilla (*Manilkara zapota*) for improvement of productivity and quality.	678,600	704,467	104
• Establishment of Avocado gene bank for selection of high yielding good quality varieties.	330,000	131,056	40
• Management of root diseases of perennial fruit crops through integrated approaches	493,038	571,795	116
Total	**509,639,576**	**427,073,139**	**84**

PROGRESS

CROP IMPROVEMENT

Durian

Thirty six accessions were collected and characterization, conservation and selection of germplasm were continued. Two extra short duration accessions were identified.

One thousand F_1 hybrids previously developed are being evaluated in the field. Flower initiation was observed in 75 plants and artificial pollination was practiced to obtain fruits in new hybrids. Sixty new F_1 individuals were established during the year. Data collection pertaining to their performance is in progress.

Citrus

Collection of local germplasm and evaluating in field gene banks are continuing with the objective of identifying high yielding and good quality Mandarin, Orange, Pumello and Lime varieties.

During the process, three promising Mandarin accessions were selected and are being evaluated in different locations to test the adaptability. One Lime, two Pumello and one

Sweet Orange promising accession were identified.

Crosses were done among the selected local parents and selected exotic parents of Sweet Orange to develop hybrids and 84 hybrid plants were established in the filed for evaluation. More than 200 hybrid individuals were developed and are in nursery stage.

Mutation breeding program was started in 2007 and those mutated plants are being evaluated in the field. Most of the mutant plants are now in flowering and bearing stage. Mutants with different growth and morphological characters and less number of seeds were observed and evaluation is continuing.

Bael Fruit (*Aegle marmelos*)

Collection of germplasm from different areas of the country and evaluation in field gene bank to find a high yielding good quality Bael fruit variety/ varieties for cultivation and conservation of the diversity of Bael fruit are being done in order to use those resources for future research programs. At present 36 germplasm were collected from different areas and two promising germplasm were identified. Studies on floral biology of Bael fruit varieties are continuing. Most of the floral characters are studied.

Other fruits and Nut crops

Beli, Mangosteen and Sapota seeds were exposed to Gamma irradiation to get favorable mutants and evaluation of newly developed mutants are in progress.

Germplasm collection program was started to collect locally available potential nut crops i.e. Almond (*Prunus dulcis* (Mill)), Wal del (*Artocarpus nobilis)* Kos Del (*Artocarpus camansi*) to identify suitable crops or varieties for using as a nut. Fourteen different accessions from different crops were collected and grafted for further evaluation.

Introduced accessions of new tropical fruit crop Salak or Snake fruit (*Salacca zalacca*) are being evaluated to ascertain the suitability under local conditions.

Papaya

Breeders' seeds of parents of Horana papaya hybrid -1 were produced at FRDI Horana during 2016. Seeds of parents were distributed to three DOA seed farms at Walpita, Ulpothagama and Mahailluppallama and to a farm at Embilipitiya under Mahaweli Authority for hybrid seed production. Totally 8.5 kg of hybrid seeds were produced under breeders supervision and it was mostly succeeded at Walpita and Embilipitiya.

Three new promising lines of papaya were identified and those lines are to be advanced up to another 3 generations to develop inbred lines.

Passion fruit

A promising composite Passion fruit variety was distributed to cultivate in large scale varietal adaptability trails in different agro climatic zones in Sri Lanka.

Nine promising high yielding varietal hybrids with field resistance to Passion fruit Mottle Virus were evaluated in replicated trial and five hybrids were selected to submit to the next varietal releasing committee meeting. Heritability studies of self-compatibility of passion fruit is going on.

Mango

Evaluation of newly developed seven hybrids is ongoing with the current hybridization program. Morphological characterization of parents was completed.

Out of 125 mango accessions established at FRDI field, 60 accessions were selected as superior quality cultivars. Planting materials produced from selected accessions were established in Horana, Eluwankulama and Agunakolapalessa research fields and 2 farmer fields at Bulathsinhala and Handapangoda for adaptability test.

Annona

13 accessions (Sour soup 8, 'Weli anona' 02, 'Seeni anoda' 01, Rolinia 02) were collected and established in the field. Collection and evaluation is continued.

Underutilized fruit crops

Floral biology studies were conducted on selected underutilized fruit crops (Wax apple, Belli, Ceylon Olive, Sour sop & Sapota)

Floral morphology and biology and pollination behavior were studied in 3 wax apple varieties (Lindula green, Golden pink & Ruby red). Fruit characteristics & yield data were recorded for different pollination behaviors.

Floral morphology, floral biology, pollination behavior, stigma receptivity and pollen viability studies were done in Annona.

In 'Weralu' and Sapota floral morphology and floral biology were studied.

Development of new hybrids through interspecific hybridization with in a family (Passifloraceae, Annonaceae & Bromeliaceae)

Interspecific hybridization in the genus Passiflora in family Passifloraceae, genus Annona in family Annonaceae and genus Ananas in family Bromiliaceae is carried out to obtain new genotypes with interesting characteristics to the prevailing cultivars for increasing the use of these species as a resource for food, medicinal, and ornamental purposes. Interspecific pollinations were carried out involving three species in Ananas for a total of 76 hybrids combinations and 3 species in Annona for a total of 54 hybrid combinations. Floral biology studies of collected species are being conducted and effective hand pollination technique for *Annona muricata* was confirmed.

AGRONOMY

Several experiments were conducted to improve the yield and quality of banana Musa spp. Var. 'Millewa Suwandal' by some specific management practices such as de-handing, application of growth stimulants and correct stage of harvesting.

When it is harvested at 15th and 16th weeks from shooting, gave higher yield with good quality Banana for the first crop and continued for the second crop.

Application of a botanical *(Kalanchoe pinnata)* effectively increased the yield and quality of banana. Trial is continued for the second crop.

An experiment was conducted to determine the effect of Gibberellic acid, Thiourea, dextrose and foliar nutrients to enhance the growth of

young Mangosteen seedlings. It was concluded that 500 ppm Gibberellic acid + 2500 ppm foliar nutrient was effective to induce the growth of Mangosteen seedlings.

An investigation was conducted to identify the effect of different type of stem cuttings with the presence of rooting hormone on propagation of Sour sop (*Annona muricata* L). Hormone treated soft wood stem cuttings could be recommended for mass propagation of the species in commercial and small scale farming.

CROP PROTECTION

Plant Pathology

Fusarium solani and *Rigidoporus microporus* isolates were identified by using ITS1 and ITS4 primers through molecular techniques. The reported pathogens were causal agents of collar and root rot and white root disease, respectively. Three antagonistic fungi were found from the rhizosphere of Jak trees.

Fifty *in-vitro* mutagenic cultures of Banana were established by using chemical and physical mutagenic agents. Twenty preliminary cultures of *Fusarium oxysporium* were established from symptomatic banana plants. Experiment is continuing to develop Panama tolerant / resistant Banana mutants.

Entomology

Nematode species responsible for root knot in guava was identified as *Meloydogyne incognita* according to its perennial pattern compared with standard patterns.

Costarican guava (*Psidium friedrichsthalii*) was identified as a resistant root stock against root knot nematode that can be used for grafting Guava.

Among the nematicides tested Abamectin was effective to control root knot nematode in nursery plants.

Diazinon 50GR, hydrogen oxalate 4G (Evisects), and Fipronil 3G at 10g per trap can be recommended for pseudo stem traps against banana weevil.

Protein bait trap can be used as an alternative to protein bait spraying in fruit fly management program.

Three botanical aspects were selected for further testing against guava mealy bug after laboratory testing.

Facilities were developed for parasitoid rearing.

FOOD SCIENCE AND TECHNOLOGY

Experiments are being conducted for development of a package to minimize postharvest losses of selected fruit crops.

An experiment conducted on NAA application at three different stages of pineapple flowers significantly increased the fruit size.

Foliar Calcium was sprayed at 3 different stages of pineapple flower to minimize internal browning of Pineapple. No significant differences could be observed among 4 different treatments. Experiment will be continued.

An experiment conducted to identify correct harvesting stage of guava revealed that green yellow stage is the best according to the physical and chemical parameters tested. Further testing will be done to confirm the results.

Twenty to thirty two weeks were taken to attain its physiological maturity according to the two seasons data collected to find out harvesting index of *Annona muricata*. Another experiment was initiated to identify the factors causing high variation.

Among the three concentrations of Gibberellic acid (GA3 -Technical grade); 250, 500 and 750 ppm applied at 4 growth stages of Annona fruit, 750 ppm resulted the highest fruit size. However it is much smaller when compared to that of hand pollinated fruit size. The study will be continued.

Production of a fruit finger from Jak fruit is in progress.

SOIL NUTRIENT MANAGEMENT

An experiment carried out to determine the effect of foliar feeding of Ca, Mg, B, Mn and Zn on Papaya showed that the leaf content of Zn is increasing with time and Ca, Mg, and Mn content decrease with time. Therefore Ca, Mg, and Mn need to be applied more.

A coordinated experiment carried out to determine the response to different levels of P and different source of P. Increasing P levels has negative effect on sugar content of Pineapple.

BIOTECHNOLOGY

Thirty gamma irradiated plantlets were artificially inoculated with *Fusarium* fungal spores and screening is continued against panama wilt resistance or tolerance.

In-vitro shoot grafting in mandarin showed 10% success rate and observed very poor feeder root development in grafted plantlets. Shoot/meristem multiplication was still not observed and research is continued.

Successful results were gained with two different antibiotic combinations to overcome the problem of systemic bacteria in cultured 'Suwandal' plants. The incorporation of Gentamycin and Amoxycillin 100mg/l from each showed 80% survival rate while Gentamicin and Rifampicin 150 mg/l from each showing 100% survival rate among the tested antibiotic combination.

In-vitro multiplication of two different 'Masan' varieties cultivated were tried and it was observed some shoot multiplications. The research is continued for further refinements.

Explants (shoot tips) establishment of 'Mora' found to be difficult as they secrete Phenol compounds and blackening of the explants was observed. Research is continued to fine ways and means to avoid the blackening and enhance the shoot multiplication. Availability of root stocks of 'Mora' is limited, thus production of required planting material problematic. Hence, *in-vitro* multiplication of root stocks is also explored and continued.

Seedless Guava germplasm layered plantlets are being evaluated in the field. Experiments are continued for *in-vitro* shoot multiplication and rooted micro cutting production. *In-vitro* multiplication is not yet observed and it appears to be affected by the high phenolic compounds present in the shoot tip explants. Experiment is continued for confirmation.

SPECIAL PROJECTS

National Food Production Program 2016 – 2018

Fruit Village Development Project (Vote No: 118-2-3-20-2502 C-15)

194 million rupees were allocated through the project for establishment of 2,000 commercial fruit villages. One village includes 900 fruit plants and maximum of 20 beneficiaries within one Grama Niladhari Division.

- More than 1120 fruit villages were established island wide.

Table 1.3.2: No. of fruit villages established under National Food Production program

Type of the fruit	No. of fruit villages
Rambutan	14
Soursop	135
Banana	27
Mangosteen	08
Papaya	148
Sweet Orange	108
Mandarin	23
Wood Apple	17
Pomegranate	83
Passion Fruit	66
Lime	94
Mango	224
Guava	121
Pine apple	32
Avocado	03
Amberella	01
Pears	03
Durian	16

- The nursery at Citrus Research Station - Bibila was developed under this project.
- Established two poly houses – (6m x 12m), one net house (18 x 50 ft) & one potting shed (18 x 20 ft) and also established the protection fence around the nursery.

Fruit Village Development project (Vote No. 285-2-2-9-2502)

15 million rupees was allocated through the project. Under this project, large number of quality planting materials were produced and 25 fruit villages were established.

Table 1.3.3: Planting material production under Fruit village development project

Crop	No. of plants
Pomegranate	18,000
Sweet Orange	15,000
Wood Apple	6,000
Mango	
• Vellaicolomban	3,000
• Tom EJC	2,000
Mandarin	8,000
Soursop	25,000
Durian	4,000
Rambutan	6,000
Sapota	500

Table 1.3.4: New fruit villages established under Fruit village development project

Type of Fruit village	Number of villages	Established District
Pomegranate	02	Ampara, Hambantota
Sweet Orange	03	Polonnaruwa, Galle, Kurunegala
Wood Apple	02	Polonnaruwa, Hambantota
Mango	05	Ampara – 2, Polonnaruwa, Anuradhapura, Matale
Mandarin	03	Polonnaruwa, Matale, Kegalle
Soursop	04	Kandy-2, Gampaha, Kurunegala
Durian	03	Gampaha, Matale, Kegalle
Rambutan	03	Kandy-2, Galle

In addition, following development activities were completed.

- Infrastructure development of 2 nurseries at FRDI, Kananwila, and Citrus Research Station, Bibile.
- FRDI - Sprinkler irrigation system for whole nursery and two poly-houses
- Citrus Research Station, Bibile - Established two poly houses
- (6m x 20m) and one net house (18ft x 50ft)

Bio Diversity Fruit Garden project Vote 285-FR-FRI-2-2-10-2502

This is a major Research & Development project at FRDI, which was granted 16 million rupees in 2016. Project consists of maintenance of already established fruit orchards, establishment of new fruit orchards and development of other infrastructure facilities.

Mother plant fruit orchard of Durian and Mandarin was established in an areas of 2.5 ha in 2016 which aims to strengthen the planting material production program. Construction of the training center was completed.

Under the project 7 million rupees were allocated for development of the fruit varieties conservation center at Kundasale. Five ha of new fruit orchards were developed during 2016. Construction of open training & conference hall was completed. Opening ceremony was held on 14th Oct 2016.

Distribution of Pruning kits

To improve the fruit productivity, 220 pruning kits were distributed in 2016. The beneficiaries were selected from the Young Farmers' clubs, which aims to develop village level pruning team for pruning fruit plants.

Increase fruit consumption through schools – In Western Province

The project was initiated with the objective of reducing the starch consumption of school children during the school hours and improve their interest on healthy foods. Two hundred grams of local fresh cut fruits and 300ml of a fruit juice are sold at Rs. 25/= each. In 2016 this was funded by the Fruit village development project. Two hundred and seventeen entrepreneurs were trained to initiate

sales outlets at schools in Western Province. To date, 7 selling outlets in 7 schools in Kalutara, 8 schools in Gampaha and 1 in Colombo district were initiated.

Income earned from planting material production

During 2016 the Institute sold 23,237 budded plants, 1,181 layered plants and 3,377 seedling plants of Rambutan, Durian, Beli, Sapota, Mango, Veralu, Jack fruit, Jambu, Star fruit, Mangosteen, Annona, Guava, Mandarin, Chempadak, Gaduguda, Citrus, Lovi and Banana.

SOCIO-ECONOMICS

Evaluation of fruit village programme (2013-2015)

The fruit village establishment was a three year programme started in 2013 and initially expected to terminate in 2015, but later it was extended to 2016. Field monitoring/ evaluation was carried out to examine farmer-field level performance in 13 fruit villages that included 2 Sweet Orange, *Psidium friedrichstalianiu* 3 Wood apple, 3 Annona, 2 Mango and 1 Grape in Polonnaruwa District and 1 Pears and 1 Pineapple village. These fruit villages have been established during the years 2013 to 2015. A sample of beneficiaries from each fruit village was interviewed and data collected through a questionnaire regarding current situation of these fruit villages. Survey indicates that the extension officers have visited the fruit villages several times but specific training programs are needed. Distribution of plants on time, selection of suitable farmers are necessary to reach expected outcomes of the project.

A survey done during the "Fruit Week" exhibition

Fruit Research and Development Institute held "Fruit week" during 8th-12th July in the institute premises. The main purpose of fruit week was to promote fruit cultivation and consumption among people. There were 20 technical stalls to provide farming techniques and facts for beneficiaries. There were 47 fresh fruit & fruit products stalls, 10 farm equipment stalls and 9 nursery plant stalls.

A survey conducted with 500 beneficiaries participated in the exhibition revealed that the majority (55%) of the sample were from Kalutara District and followed by Colombo and Gampaha Districts. According to the survey results, 90% of the whole sample had bought at least one or more fruit plants from the exhibition. 90% of the whole sample grow fruit plants in their home gardens.

SERVICES

Field investigations, sample collection, disease and pest diagnosis and giving recommendations were done for outstation farmers and in research fields of FRDI, Horana. 62 samples were diagnosed and recommendations were given for outstation farmers and 30 samples were diagnosed in FRDI research fields and nurseries.

Six hundred & thirty one soil samples and 30 plant tissue samples were analyzed.

More than 2,000 farmers were advised on fruit cultivation.

Training and awareness programs

Thirty training programs were conducted on fruit cultivation, pest & disease of fruit crops,

bio technology (Tissue Culture) for 1,003 participants comprising of agriculture officers, farmers & entrepreneurs, teachers, university students & Agriculture Diploma students. Job training programs were conducted for 32 Agriculture Diploma students and university students.

A total of 3,551 individuals visited the institute to acquire knowledge on fruit cultivation.

Four training programs for officers of other ministries were also conducted.

Two university students completed their research projects at FRDI.

Mass Media

Eight live radio programs and 3 TV programs were broadcasted on fruit crop cultivation, Pest and disease management, tissue culture and food processing with the participation of FRDI scientists during 2016.

PLAN FOR 2017

Crop Improvement

- Development of seedless Guava variety
- Development of high yielding good quality Durian varieties for commercial cultivation
- Development of high yielding good quality Durian varieties through hybridization
- Development of good quality, high yielding seedless / less seed Citrus mutants ('Nasnaran', HOCR 24)
- Collection, evaluation, characterization and selection of Beli germplasm
- Study the floral biology and flowering behaviour of 'Beli'.
- Identification and selection of potential crops/ varieties (Almond, 'Wal Del', and 'Kos del') for nut purpose.
- Development of high yielding good quality Citrus (Orange and Mandarin) varieties.
- Evaluation of Salak/ Snake fruit (*Salacca zalacca)* varieties.
- Development of good quality high yielding cultivars of Mango for different Agro Ecological Zones.
- Characterization of flowering behaviour & floral biology of 'Beli', Wax apple, Ceylon Olive, Sour sop and 'Sapodilla' for improvement of productivity & quality.
- Development of good quality Jack fruit varieties.
- Seed production of Horana Papaya Hybrid-1
- Development of new hybrids through interspecific hybridization in family Passifloraceae, Annonaceae and Bromeliaceae.
- Development of Yellow passion fruit (*Passiflora edulis* f. *flavicarpa*) varieties through hybridization and varietal selection.
- Development of hybrids of Mango.
- Studying inheritance of self-compatibility and passion fruit mottle virus resistance.
- Collection, evaluation and selection of Gaduguda.
- Development of Annona varieties (Soursop, Custard Apple, Sugar Apple etc.) with high yield and good quality.
- Development of high yielding good quality fruit varieties through mutation.

Agronomy

- Productivity increase of Mango by canopy management using different training & pruning techniques.
- Testing of different high density spacing under control & open environments for 3 Mango cultivars.
- Flowering induction of Mango by inducing moisture stress conditions and applying PGR under control & open environment.
- Effect of stem diameter of root stock and maturity status of scion on success of wedge grafting of Annona (*Annona muricata L)*
- Effect of age of bunch harvest on quality and shelf life of Banana var 'Millewa Suwandel'.
- Effect of different spacing of Annona (*Annona muricata* L.) on yield and quality.
- Use of growth regulators for the production of seedless Annona.
- Effect of botanical (*Kalanchoe pinnata*) in combination with de-handing of bunch on yield and quality of banana.
- Possibility of using different suckers for planting material production and to increase fruit production of Pineapple.

Food Science and Technology

- Production of vegetable finger from Jack fruit.

Soil Nutrient Management

- Reduce the fertilizer use through site specific fertilizer recommendation for Papaya, Passion fruit.
- Use of bio pore infiltration technique to reduce disorder in Mangosteen.
- Effect of foliar feeding of K on yield, quality and post-harvest life of Banana.
- Testing of three different fertilizers for Papaya.

Plant Pathology

- Development of Panama disease tolerant/ resistant Banana mutants through tissue culture.
- Management of root diseases of perennial fruit trees through integrated approaches.

Bio Technology

- Micro propagation of DOA recommended Banana var. 'Millewa Suwandal'.
- Crop improvement through induced mutation in Banana.
- Micro propagation of Mandarin.
- Micro propagation of underutilized fruit crops (Masan, Mora).

Post harvest Technology

- Development of harvesting indices of *Annona muricata*
- Development of package for minimize postharvest losses of selected fruit crops (Pineapple, Guava, Avocado) researching is being continuing
- Effect of pre harvest (Application of Plant growth retardants PGR and foliar Calcium) and post harvest treatments (packaging materials and different storage conditions) on quality and shelf life of Mauritius Pineapple. Continuation of the experiments.
- Identification of correct maturity stages of selected fruits (Guava, Avocado).

- Maintain quality and extend shelf life of selected fruit crops (Mango, Rambutan).
- Conducting training program for minimize post-harvest losses of fruits.
- Value added products from Pineapple, Mango, Rambutan.

Entomology

- Enhancement of food productivity of fruit crops by managing major pests.
- Improvement of modern technologies for continuous production of selected fruit crops for export market. (Crops - Mango, Rambutan, Pineapple, Guava, Apple, Pears, Strawberry)
- Management of root knot nematode in Guava.
- Evaluation of grafted Guava plants on resistant root stock
- Testing of nematicides for Guava nursery plants
- Other management practices to reduce root knot nematode to reduce root knot nematode.

STAFF LIST

Designation	No. Approved	No. Existing
Director	01	01
Additional Director	01	01
Deputy Director	01	01
Assistant Director of Agriculture (Research)	18	09
Assistant Director of Agriculture (Development)	03	02
Assistant Director of Agriculture (Economics)	01	01
Administrative Officer	01	01
Economist Assistant	01	-
Program Assistant (Agriculture)	09	04
Development Officer	05	01
Agriculture Instructor	07	16
Research Assistant	35	19
Engineering Assistant	01	-
Public Management Assistant	10	10
Technological Assistant (Engineering)	01	01
Technological Assistant (Extension)	03	03
Farm Clerk	01	01
Driver	06	07
Tractor Operator	02	02
Storeman	01	01
Mechanic	01	-
Carpenter	01	-

Designation	No. Approved	No. Existing
Mason	01	-
Electrician	01	-
Technician	01	-
Research Sub Assistant	04	-
Budder	03	03
Office Employee	01	-
Watcher	08	07
Laborer (Permanent)	111	84
Laborer (Contract)	65	36
Laborer (Contract) - NARP Projects	-	15
Total	**305**	**226**

1.3.1 FRUIT CROP RESEARCH AND DEVELOPMENT STATION (FCRDS) – GANNORUWA

Fruit Crop Research and Development Station, Gannoruwa undertakes research and development activities to enhance the production and productivity of fruit crops. Container planting of fruit crops and landscaping using fruit plants (edible landscaping) are also given a high priority under these programs. Furthermore, it serves the community by conducting training programs for officers, students of the universities, higher diploma students etc., farmers and other stakeholders on fruit crop cultivation and management. The division of plant propagation and nursery management produces large number of planting materials including underutilized fruit crop spp. for various research and development projects and for the SPMDC and provide a considerable fraction of the national requirement.

BUDGET

Table 1.3.1.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
FCRDS, Gannoruwa			
Recurrent	5,077,384	4,246,530	84
Capital	2,075,000	1,662,999	80
Projects			
• Fruit village development			
• o Establishment of demonstration and research fruit orchard	500,000	474,432	95
• o Production of planting materials of Avocado & Annona	300,000	112,418	37
• Special plant breeding project			
• o Selection of new Banana varieties	600,000	472,610	79
• o Development of Longan varieties	700,000	675,000	96
• National Agriculture Research Projects			
• Development of Durian varieties	400,000	395,090	99
• Improvement of yield and quality of Banana	200,000	191,495	96
• Development of Papaya varieties	769,000	626,731	81
• Development of Avocado	330,000	269,350	82
• Food production program			
• Effect of climatic factors	4,000,000	1,478,698	37
Total	**14,951,384**	**10,605,353**	**71**

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Rambutan Research Unit, Eraminigolla			
Recurrent	124,000	102,750	83
Capital	300,000	300,000	100
Total	**424,000**	**402,750**	**95**
Horticulture Research Farm, Ambatenna			
Recurrent	776,850	714,615	92
Capital	575,000	430,635	75
Projects			
• Fruit village program	1,000,000	904,607	90
• Food production	1,200,000	544,572	45
Total	**3,551,850**	**2,594,429**	**73**
Grand Total	**18,927,234**	**13,602,532**	**72**

PROGRESS

RESEARCH

Fruit Breeding -Major Fruits

Banana

A 'Seeni kesel' accession which showed tolerant to Panama disease along with other important characters such as high yielding ability with good quality was released as 'Gannoruwa Seeni1' and high yielding, good quality 'Rath Kesel' variety was released as 'Gannoruwa Red Banana'. Artificially induced mutant banana plants of 'Embon' and 'Kolikuttu' evaluation is in progress.

Papaya

Papaya lines were developed through cyclic selection and the activity is continued with the hope of development of inbred lines.

Guava

A promising accession which gives high yield with good quality fruit was identified. Nematode resistant Guava spp. (*Psidium friedrichsthalianum)* with grafting compatible to common Guava was identified through a series of experiments. Grafted plants exhibited good performances under field condition and those were similar to Guava-Guava grafted plants.

Avocado

Twenty accessions were collected from farmer's fields. 1.5 ha land was developed and recommended varieties were established.

Durian

Evaluation of new accessions is in progress.

Under Utilized Fruit Crops

Evaluations are being continued in the field gene bank and in containers. During the process two promising accessions from each were identified from Aonla, Longan and Jamun.

AGRONOMY

Durian

Effect of root pruning was tested in order to improve the survival percentage. Root pruning after grafting of 1.5 months old Durian seedlings and re-potting has shown higher grafting success, shoot and root growth and higher percentage survival after transplanting. Long term evaluation trials on farmer fields were established for confirmation.

A long term research program related to planting material production and development of new technologies to enhance the planting material production of under-utilized fruit species were conducted. Priority has been given to highly demanded under-utilized fruit species i.e. Bale fruit, Ber, Longan, Aonla and Bignay, Sour sop etc.

DEVELOPMENT

Training programs

Training programs were conducted on pruning of fruit crops, nursery management, plant propagation techniques with emphasis on budding, grafting, seed germination and techniques of container planting & root-balling. Officers of the FCRDS participated as resources persons in training programs of which were held at ISTI, Gannoruwa and other venues.

Farmer training programs - 08 (No. of farmers - 425)

Officer training programs - 06 (No. of Officers - 203)

University/Diploma/other student's programs - 25 (No. of students - 855)

Student's Research Projects

Assisting university students during their research programs is being done every year. This year, four under-graduate students who conducted their final year research projects were supervised.

Exhibitions

Actively participated in the exhibition organized under the theme of “Fruit week” held at FRDI, Horana.

Extension activities

During the year, the officers of FCRDS participated in 09 radio programs which were aired through ‘Kandurata Guwanviduli Govi Sewawa’ and 03 TV programs on fruit cultivation. Instructions on fruit cultivation and pest & disease management were given for about 85 fruit growers who visited the station or made requests through telephone.

Planting material production

Plant Propagation and Nursery Management Division in collaboration with the Research Division were able to produce planting materials under SPMDC, Fruit Village Development and Food Production projects.

Table 1.3.1.2: Planting material production (SPMDC) 2016, Gannoruwa

Type of plants	No. of plants produced
Sapota - Grafted	500
Durian - Grafted	245
Jack Fruit - Grafted	1,095
Carambola - Grafted	500
Butter fruit - Grafted	3,121
Uguressa - Grafted	250

Type of plants	No. of plants produced
Weralu - Grafted	200
Bael fruit-Grafted	300
Other-Grafted	1500
Sour sop - Seedlings	2,000
Other seedlings	277
Total	**9,988**

Table 1.3.1.3: Planting material production – Fruit village program 2016

Vote	No. of plants produced
Avocado - Grafts	1,100
Sour sop - Seedlings	4,500
Total	**5,600**

In addition 1,000 No. of Wood apple seedlings were produced under Food production program.

RAMBUTAN RESERCH UNIT - ERAMINIGOLLA

Rambutan Research unit is situated in Kegalle District which is mainly designated to conduct research and development activities related to Rambutan. Most of the area of the unit is covered with a Rambutan plantation. In addition, mother plants of recommended Jack fruit varieties also exist within the Unit. The Unit has a fruit nursery which produces planting materials, especially Rambutan, Jack fruit and Ber.

Progress

Planting material production

Fruit nursery of the unit produced following planting materials under Fruit Village project.

Table 1.3.1.4: Planting material production at Rambutan Research Unit - 2016

Type of plant	No. of plants produced
Rambutan - Grafted plants	2,500
Rambutan - Root stock	5,000
Ber - Grafted plants	190
Sour sop - Seedlings	6,000

HORTICULTURE RESEARCH FARM - AMBATENNA

Horticulture Research Farm, Ambathenna is a small farm with 1.9 ha. in extent mainly occupied with fruit trees, namely Rambutan, Durian and Banana. The farm nursery produces planting material of Durian, Rambutan, Carambola and many other fruit crop spp.

Progress

Planting material production

Fruit nursery of the unit produced following planting materials under Fruit Village project and funds were received from Seed and Planting material Development Center.

Table 1.3.1.5: Planting material production at HRF, Ambathenna

Type of plants	No. of plants produced
Sapota - Grafted	250
Durian - Grafted	1,000
Jack Fruit - Grafted	200
Carambola - Grafted	3,285
Jambu- Grafted	651

Type of plants	No. of plants produced
Guava – Grafted	700
Sour sop - Grafted	620
Lemon rooted cuttings	1,000
Rose apple	645
Other	50
Guava seedlings	1,370
Sour sop seedlings	4,150
Passion fruit	275
Lime seedlings	610
Dwarf Ambarella seedlings	975
Vegetable seedling pots	1,751
Other seedlings	1,283
Total	**8,663**

Table 1.3.1.6: Planting material production under Fruit village program

Type of plants	No. of plants produced
Sour sop seedlings	8,000
Rambutan grafts	150

Table 1.3.1.7: Planting material production under Food production program

Type of plants	No. of plants produced
Sour sop seedlings	16,000

NATIONAL FRUIT VARIETY CONSERVATION CENTRE - KUNDASALE

This Centre was established on 8th November, 2012 with the objective of conserving all the recommended fruit varieties at this Centre. This centre was declared open on 14.10.2016.

Present status of the Variety Conservation

Establishment of 109 varieties of fruit crops which belong to 44 different fruit crop species were done and routine maintenance activities are being done. There are 3493 plants in the field and 493 plants are in pots.

Training programs

Twelve programs were conducted for Farmers, Agriculture school students, Teachers and Other Officers etc.

PLAN FOR 2017

FCRDS, GANNORUWA

Research - Fruit Breeding

- Development of high yielding good quality Papaya varieties.
- Development of Panama resistant/ tolerant high yielding good quality Banana varieties through induced mutation.
- Selection of high yielding good quality Citrus varieties for Mid Country Wet Zone.
- Selection of Avocado varieties for Mid Country Wet Zone.
- Selection of high yielding good quality Guava varieties for Mid Country Wet Zone.
- Evaluation of 'Embon' banana accession selected from the germplasm evaluation
- Evaluation of local and exotic mango germplasm and selection of promising accessions
- Evaluation of Durian germplasm to select better accessions for release.

- Ex-situ evaluation of under-utilized fruit species
- Evaluation of outstanding under-utilized fruit crop accessions. eg. Bale fruit, Ber, Longan, Jamun, Aonla and etc.
- Development of high yielding good quality Longan varieties through mutation breeding.
- Evaluation of promising accessions of under-utilized fruit species under different Agro Ecological conditions.

Agronomy and Other

- Evaluation of vegetative propagation methods for under-utilized fruit spp. i.e., Sour sop, Ber, Ceylon olive and Governor's plum, Velvet tamarind etc.
- Evaluation of seed bed media for seed germination of Ceylon olive.
- Evaluation of local fruit spp. in large containers.
- Studies to enhance early seed germination, seedling growth, grafting success of Ber, Sour sop and Ceylon olive.
- Effect of chemicals on fruit drop and yield of Rambutan
- Effect of chemicals on fruit set, retention and yield of Avocado
- Effect of Gibberellins on fruit size of Thompson Seedless grapes.

RAMBUTAN RESEARCH UNIT, ERAMINIGOLLA

Development

- Planting material production of Rambutan and Ber
- Pruning and management of over aged Rambutan trees.

HORTICULTURE RESEARCH FARM, AMBATENNA

- Planting material production of fruits and other crops
- Pruning and management of over aged Rambutan trees.
- Improvement of facilities of the farm.

STAFF LIST

FCRDS, Gannoruwa

Designation	No. Existing
Head of the Institute / Assistant Director of Agriculture (Research) In Charge	01
Assistant Director of Agriculture (Research)	01
Program Assistant (Agriculture)	01
Development Officer	01
Farm Manager	01
Agricultural Instructor	01
Research Assistant	03
Chief Public Management Assistant	01
Public Management Assistant	01
Technological Assistant	04
Farm Clerk	02
Driver	02
Tractor Operator	01
Research Sub Assistant	02
Welder	01
Budder	03
Watcher	13
Laborer (Permanent)	47
Laborer (Contract)	15
Total	**100**

Rambutan Research Unit, Eraminigolla

Designation	No. Existing
Farm Manager	01
Development officer	01
Agriculture Instructor	01
Budder	01
Watcher	02
Laborer (Permanent)	04
Total	**10**

HRF, Ambathenna

Designation	No. Existing
Farm Manager	01
Assistant Farm Manager	01
Agriculture Instructor	01
Technological Assistant	02
Farm Clerk	02
Watcher	03
Laborer (Permanent)	13
Laborer (Contract)	02
Total	**25**

National Fruit Varieties Conservation Centre, Kundasale

Designation	No. Existing
Farm Manager	01
Farm Clerk	01
Driver	01
Research Sub Assistant	01
Watcher	05
Laborer (Permanent)	22
Total	**31**

1.3.2 PLANT VIRUS INDEXING CENTRE (PVIC) -HOMAGAMA

The Plant Virus Indexing Centre, Homagama functions under the administration of the Director, Fruit Research & Development Institute, (FRDI), Horana. The activities of the Centre are application of currently used advanced technologies for plant virus and virus like organism detection, production of test kits for virus and other organism detection in laboratory and field indexing, quarantine purposes, epidemiological investigations, evaluation of possible management methods, development of virus free basic foundation stocks, investigation of virus coat protein mediated resistance, and detection of other pathogenic organisms (fungal, bacterial, nematodes, viroids and phytoplasma). The substation "Eco friendly agriculture technology unit" at Diyagama disseminates technology including a serious of activities relevant to research and extension.

BUDGET

Table 1.3.2.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	3,446,042	2,796,992	81
Capital	1,450,000	1,082,362	75
Projects			
• Development of Pomegranate promising lines through *in-vitro*	462,300	386,911	84
• Development of technologies for the production of virus free planting material through propagation techniques for selected fruit crops (Papaya, Citrus and Pineapple special varieties)	3,000,000	1,282,880	43
• Identification and confirmation of phytoplasma diseases and their host range in cultivated crops	1,209,000	1,189,593	98
• Identification of virus and virus like diseases in Cucurbits, Chilli, and Legumes in Southern Dry Zone region in Sri Lanka	1,240,000	1,235,028	100
• Isolation and Identification of potential plant growth promoting Rhizobacteria for control of papaya Rings Spot Virus in Papaya through induced systemic resistance	720,000	714,060	99

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• Integrated pest management program for controlling of stem borers in Mango and Durian	843,000	384,995	46
• Optimization of Micro propagation protocol for DOA recommended Banana variety, Agra	420,000	334,628	80
• Development of high yielding and high quality Grape promising lines through tissue culture technology	2,000,000	1,841,898	92
• Development of rapid detection techniques for identification of fruit crop diseases using molecular methods	2,000,000	1,973,611	99
• Establishment of eco friendly ecosystem at Diyagama	2,000,000	1,082,487	54
Total	**18,790,342**	**14,305,445**	**76**

PROGRESS

PLANT VIROLOGY

- Tomato (*Lycopersicon esculentum*), Marigold (*Tagetes erecta*), 'Attana' (*Datura metel*) were confirmed as alternative host for Chilli veinal mosaic virus (ChiVMV). This is the first record of ChiVMV detection in Marigold. The study is continued.
- In Southern Dry Zone region virus disease incidences in Cucurbits are: Squash mosaic virus - 7%, Cucumber mosaic virus - 8%, Water melon cholorotic stunt virus - 14%, Zuchchini yellow mosaic virus - 3%, Cucurbit aphid born yellow virus - 14% Cucumber green mottle mosaic virus - 6%, Phytoplasma - 37%, Poty group virus - 29% Melon necrotic spot virus and Tomato ring spot viruses were not found. This is the first record of the detection of Cucurbit aphid borne yellow virus and water melon cholorotic stunt virus in Cucurbits in Sri Lanka.
- Groundnut bud necrosis in third season Mung bean cultivation was not recorded during 2016 in many areas. Around 1% infection was recorded in Galewela in the Kurunagala district.
- An antiserum was produced for ChiVMV. Protocol optimization is carried out at present.
- Ecological Engineering concept was applied for the management of viral disease in Chilli. A reduction in the disease incidence was observed. An experiment will be continued with different treatments.

Routine virus indexing under Plant virology

- Around 750 plant samples were tested for different viruses. An income of Rs 80,000 was earned.

MOLECULAR VIROLOGY

- To prepare a gene construct for the production of transgenic papaya, sense and antisense primers were designed to amplify the desired region of the coat protein gene of Sri Lankan isolation of the Papaya Ring Spot Virus disease (PRSV). Primers were tested with DNA polymerase (Taq DNA) and best annealing temperature was selected. Ligation procedure is in progress.
- Certain Cucurbit species displayed the "little leaf" disease symptoms such as dwarfed, thickened and puckered leaves and shortened internodes. The DNA was extracted from disease suspected plants and subjected to direct PCR. Then the DNA was again assayed in a nested-PCR and phytoplasma was further confirmed by gene sequencing.
- A survey was carried out in 10 districts of Sri Lanka based on 5 crop commodities to identify and confirm phytoplasma. It was confirmed that Avocado, Citrus, Sapota, Chilli, Tomato, Luffa, Petunia, Chrysanthemum, Sesame and Corn were infected with phytoplasma. Ten other host plants were identified (Garcinia, Zinnia, 'Wal rubber', Guinea grass, 'Kukul karamala', 'Nelli', Begonia spp., 'Thumba karawila', Water melon, 'Wal koththamalli', 'Crimson penda' or 'Red penda')
- Five protocols were developed to identify the fungal diseases in fruit crops by molecular methods (white root - Jak, Phytopthora - Durian, Citrus, Papaya, Panama - Banana, Phytoplasma - Papaya, Avocado, Powdery mildew - Rambutan, Papaya).
- A molecular based detection technique was developed for Potato Virus S (PVS).

Routine virus indexing under Molecular virology

- Four thousand one hundred and fifty four (4,154) disease suspected plant samples including vegetables, fruit crops, ornamental plants and tuber crops were indexed for viruses. An income of Rs. 1,103,000 was generated.

BIOTECHNOLOGY

- The multiplication rate of 'Kolikuttu' variety Agra is significantly low in the optimized protocol and the protocol need to be revised. Therefore an experiment was initiated to overcome above problem and the cultures are in multiplication stage at present.
- Some somoclonal variations were observed in field evaluation programs of tissue cultured pineapple. Therefore, an experiment was initiated for further optimization of the protocols. Field evaluation is going on.
- Plants can be regenerated from available vegetative material through callus culture and this method can be used in mutation breeding programs as a valuable tool. Surface sterilization, establishment and callus induction steps were successfully completed and at present, the experiment is in embryo development stage.
- Fluorescent lamps are most commonly used in tissue culture labs. However, the electricity consumption is comparatively high. Therefore, LED has been proposed as a potential alternative light source for

Tissue culture. This research was initiated to study the effect of LED on growth and multiplication of TC plantlets.

- Optimized the protocol for production of Pomegranate planting material through leaf culture. Produced plants were established in ARS, Kalpitiya. Two plants were selected with red colour peel, red color flesh, and soft seeded fruit.
- Protocol was optimized for nodal culture of Pomegranate. Plants are being evaluated under greenhouse conditions.
- Pineapple plants with desirable characteristics were identified to produce new Pineapple promising lines by cross pollination. Cross pollination was carried out with variety Kew, Mauritius and MG3. Evaluation is going on under field conditions.
- A protocol for multiplication of Papaya through shoot tip culture was optimized. Field evaluation was completed.
- Tested a protocol for *in-vitro* seed germination and multiplication of apple. Plants are under hardening stage.

Development programs

- To cater the high demand of tissue cultured Banana plants, a new program was initiated to produce 10,000 disease free plants. Around 1,200 cultures are available in multiplication and rooting stages from 'Kolikuttu' and 'Embon' varieties. These plants will be issued to Seeds and planting material division in 2017 for further hardening and distribution.

EPIDEMIOLOGY/ ENTOMOLOGY

- Identification of Stem borer attacked fields and stem injection of systemic insecticides; Fipronil and Imidocloprid 200g/l SC were included. Awareness programs, field demonstrations were carried out in Urapola, Meerigama and Pasyala. The interim recommendation was given to the farmers. Stem borers, Root stem and fruit rot, Shot hole borers and cultivated trees in ill drained conditions were identified as reasons for death of Durian trees. The findings have been published and disseminated through electronic media.
- The study was carried out for managing fruit quality associated pests, diseases and disorders were continued with different bagging materials with Guava fruits and it was also confirmed that the blue colour is good for development of fruit size.
- Identification of causal factors for immature fruit drop in Ridge gourd and to give recommendations for the management was carried out with different fertilizer rates of inorganic and organic fertilizers and their combinations with foliar application of Potassium for LA-33 variety. It did not show any impact on managing the issue.

MICROBIOLOGY

- A field trial was conducted to control of papaya ring spot virus (PRSV) in Papaya (*Carica papaya*) through induced systemic resistance using Plant Growth Promoting Rhizo bacteria (PGPR) selected from the pot trial. Few *Pseudomonas fluorescence* isolates showed reduction of disease

severity until fruiting stage. Disease severity of the fruits has been reduced.

- Suitable storage methods for *Pseudomonas fluorescence* were tested. Under *in- vitro* condition, slant culture and distilled water showed good storage ability up to 10 months. Under *in-vivo*, compost showed satisfactory survival of *Pseudomonas fluorescence* up to 3 months.
- Another few fungus spp causing leaf browning of *Echinodorus bleheri* was identified as, *Phoma* spp, *Pythium* spp, *Fusarium* spp, *Rizophus* spp. Under protected environment, Propiconozole, Thiophenate methyl, Copper oxychloride and Carbendazim can be used to manage this problem. But under natural condition only Propiconozole can be used. It is important to maintain mother plants under protected house.
- Application of *Pseudomonas fluorescence* rhizobacteria was done to manage Chilli veinal mosaic virus in Chilli (ChiVMV). Five *Pseudomonas fluorescence* isolates showed reduction in disease severity in pot trial. Field trials will be continued.

Routine indexing

- Around 250 disease samples were tested to identify causal agents and recommendations were given.

TECHNOLOGY TRANSFER

- 12 radio programs (All divisions) 20 newspaper articles (New invention of PVIC and farmers problems solving program) 80 field inspections, 12 home garden promotion programs, 05 crop clinics, 04 exhibition programs and 50 awareness/ training programs (Officers/ farmers/ Teachers/ Student officer) were carried out.
- Advises were given to 98 farmers/ growers who have visited the Centre. In addition telephone call advices were given to more than 300 farmers/ growers.
- Maintenance of one urban agriculture model and 01 home garden model in the centre. 03 field days and 04 innovative programs were carried out.
- Several extension activities were conducted for environmental friendly agriculture programs at Diyagama Mahinda Rajapakshe Sports Complex.
- 13 training workshops (04 day), 06 programs for school teachers and one training program for orchid growers were conducted by the tissue culture division.
- 01 M.Sc. student (Plant Virology) and 07 undergraduate students (03 Plant Virology, 01 Microbiology, 02 Molecular Virology, 01 Tissue Culture) carried out their final year research projects. 08 university students and 10 Diploma (NVQ) students (2 Plant virology, 06 Tissue culture, 2 Microbiology) were accommodated to fulfill their training requirements.
- One training for vocational training students (Contribution of all division). From these programs, 04 officers, and 36 individuals were benefited.
- Theory and practical training on ELISA, PCR, microbiology technique were given to 794 advanced level school children (25 groups), by the plant virology, molecular virology and microbiology divisions.

PLAN FOR 2017

Plant Virology

- Identification and management of virus and virus like diseases in Cucurbits, Legumes and Chilli in Southern Dry Zone of Sri Lanka. (Collaboration with GLORDC)
- Host range study for Chilli venial mosaic virus (ChiVMV) in Chilli in progress.
- Production of polyclonal antiserum for Chilli veinal mottle virus in Chilli in progress.
- Management of Pineapple mealy bug wilt virus (PWV) in Pineapple.
- Use of ecological engineering concept for management of viral disease in Papaya and Chilli.

Molecular Virology

- Confirmation of seed borne ability of phytoplasma.
- Identification and confirmation of phytoplasma diseases and their strains in cultivated crops and other host plants.
- To identify the genetic diversity of *Fusarium oxysporum* f. sp. *Cubense in* 'Kolikuttu' banana.
- Development of transgenic papaya through *Agrobacterium* mediated transformation.

Biotechnology

- Micro propagation of DOA recommended Banana variety Agra.
- Micro propagation of economically important Grape varieties.
- Micro propagation of economically important Pineapple varieties.
- Study the effect of LED on growth and multiplication of tissue cultured plants.
- Planting material production of selected Pomegranate lines through nodal culture technology.
- Development of promising Pomegranate lines through *in-vitro* mutation using gamma radiation (Collaboration with Adaptive Research Station, Kalpitiya)
- Production of new Pineapple variety by using cross pollination and tissue culture technology.
- Production of tissue cultured hybrid Papaya planting material using local hybrid seeds.
- Production of Apple planting material using seed culture from imported fruits.

Epidemiology/ Entomology

- Development of a protocol for trunk injection of pesticides as a part of an Integrated Pest Management program for controlling Stem Borers in Mango and Durian.
- Enhancement of the productivity of fruit crops by managing major pest problems.
- Identification of causal factors for immature fruit drops in Cucumber.

Microbiology

- Control of papaya rings spot virus (PRSV) in Papaya through induced systemic resistance using Plant Growth Promoting Rhizobacteria (PGPR) in progress.
- Induced systemic resistance against Chilli veinal mosaic virus in Chilli (ChiVMV) using *Pseudomonas fluorescence* in progress.
- Potential use of soil antagonisms for successful management of Panama disease

in Banana caused by *Fusarium oxysporium* sp. *Cubesence*.

Technology Transfer

- Conducting awareness/ training programs (Government officers – 05 groups, Graduate teachers - 02 groups, School students (A/L) - 20 groups, Vocational trainees - 05 groups, Tissue culture (04 day) training - 05 groups, Institutional awareness programs - 03)
- Plant clinic program - 05, Field days – 05, Exhibition - 03, Field inspections - 100
- Urban Agriculture unit - 01, Home garden - 01
- SLBC programs - 12 , Newspaper articles - 50
- Officers presentation skills development program (Tech talk) – 12.

Eco friendly Agriculture Technology Unit

A 15 acre, park situated at the Mahinda Rajapakse International Sport Complex, Diyagama, The established eco-system consists of varieties of fruit plants (major & underutilized) and perennials, spice garden, collection of medicinal plants, export agriculture crops, local yams, foliage and flowering plant beds, environment friendly vegetable garden with a plant nursery, bio gas unit, protected agriculture, bee keeping unit, mushroom house, different irrigation systems, dairy and compost unit, a complete meteorology unit and a few green belts with endemic forest species for reforestation.

- An *in-situ* Banana mother plant collection has been established (isolated condition) and replicated field trials are being carried out.
- Maintenance of the existing cultivation.

STAFF LIST

Designation	No. Existing
Deputy Director Research	01
Assistant Director of Agriculture (Research)	05
Assistant Director of Agriculture (Development)	01
Program Assistant (Agriculture)	03
Farm Manager	01
Assistant Farm Manager	01
Agriculture instructor	03
Research Assistant	08
Public Management Assistant	04
Technological Assistant	01
Driver	03
Storeman	01
Office Employee	01
Watcher	03
Laborer (Permanent)	16
Laborer (Contract)	05
Total	**57**

Eco friendly Agriculture Technology Unit

Designation	No. Existing
Agriculture Instructor	02
Laborer (Permanent)	01
Laborer (Contract)	04
Total	**07**

1.4 RICE RESEARCH AND DEVELOPMENT INSTITUTE (RRDI) - BATALAGODA

Presently, the rice production has achieved the level of self sufficiency and it is of vital importance to maintain the stability of annual productivity to ensure food security. Prevailing adverse weather conditions and frequent changing of rainfall pattern due to global warming are major constraints against maintaining the stability of rice productivity. Therefore, rice research and development program is targeted to develop high yielding rice varieties adaptable to different rice growing eco-systems, to develop appropriate technologies for these varieties and to primarily disseminate varieties and technologies.

BUDGET

Table 1.4.1: Annual Budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	24,213,230	22,153,328	91
Capital	11,257,762	9,575,526	85
Projects			
• Infrastructure development	50,000,000	42,419,669	85
• National Food Production Program			
○ Development of BPH and GM resistant rice varieties	1,000,000	1,004,292	100
○ Development of BLB resistant rice varieties	4,500,000	4,433,984	99
○ Productivity improvement of rice	10,500,000	10,435,774	99
• Foreign projects			
○ Green super rice	1,688,000	1,006,000	60
○ Closing rice yield gap	3,358,000	2,708,093	81
○ Increasing productivity of direct seeded rice areas	3,484,000	3,461,561	99
○ Management of weeds and weedy rice in direct seeded rice	300,000	55,634	19
○ Weedy rice management and characterizing of herbicide resistance	840,000	768,986	92
○ Establishment of model farming village	13,230,000	5,080,788	38
○ Development of rice production technologies	8,550	8,550	100
• Local projects			
○ Development of rice varieties for abiotic stresses	559,000	609,820	109

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
○ Determination of phosphorus fertilizer requirement	2,248,000	1,534,792	68
○ Identification of biotypes of brown plant hopper	359,800	362,506	101
○ Development of locally adaptable cytoplasm male sterile (CMS) lines	633,000	619,331	98
○ Development of new salinity tolerant rice lines to improve rice productivity	1,313,100	1,403,063	107
○ Development of BPH resistant new rice lines as eco-friendly approach	1,050,000	721,530	69
○ Introgression of temperature tolerance to mega rice varieties in Sri Lanka	1,614,700	1,648,253	102
○ Development of integrated management method for rice field rats	714,000	767,616	108
○ Improvement of grain quality attributes of rice varieties	447,900	420,445	94
○ Integrated weed management approach in direct seeded rice (DSR)	786,400	772,384	98
○ Establishment of an e-pest surveillance and forecasting system	512,000	446,934	87
○ Development of rice varieties for salinity affected flood prone soil condition	259,700	224,220	86
○ Management of climate and soil related problems of acid sulphate soils	543,300	338,638	62
Total	**135,420,442**	**112,981,718**	**83**

PROGRESS

RESEARCH

Rice Varietal Improvement

The varietal improvement at RRDI is focused on developing varieties with higher yield potential and high genetic resistance for pest and diseases to minimize production inputs and environment pollution. Development of tolerant varieties against salinity, iron toxicity and submergence is also anticipated. Substantial gains have been achieved by developing new elite lines with wide genetic base, resistant to many biotic factors and good grain quality during the year 2016.

New rice variety belonging to $2^1/_2$ month maturity group was released as Bg 252. It is a red pericarp, short round grain type variety suitable for rainfed rice cultivation in areas with short season.

New rice variety belonging to $3^1/_2$ month maturity group was released as Bg 374. It is a white pericarp and long slender grain type variety.

4-4½ months age class rice

Ten crosses were made. Eight F_1 populations and ten F_2 – F_4 populations were established. Two hundred twenty eight advanced progenies were selected from 20 populations.

Eighteen elite lines were evaluated in yield trial for major pest and disease, grain yield and grain quality characteristics. 14-1657 and 14-606 were identified as better lines. 11-1689, 11-1759, 12-685, 11-1657 advanced lines were purified and multiplied.

3½ month age class rice

Sixteen crosses were made. Thirty seven populations from F_2 to F_4 were established and 14 populations were advanced. From F_5 generation onwards, 496 progenies from 36 populations were selected.

Sixteen elite lines in preliminary yield trial and 8 lines in major yield trial were evaluated and Bg 14-567 was identified as a promising line. Rice lines Bg 10-2398, Bg 10-1407, Bg 10-1258 and Bg 11-802 were multiplied.

3 months age class rice

Eighteen crosses were made. Thirty seven populations from F_2 to F_4 were established and 28 populations were advanced. From F_5 generation onwards, 496 progenies from 31 populations were selected.

Twenty nine elite lines in preliminary yield trial and 14 lines in major yield trial were evaluated. Bg 13-1365, Bg 15-2288, Bg 14-2374 and Bg 13-1219 were identified as promising.

2½ months age class rice

Twenty four crosses were made. Twenty F_1 generations were established. Twenty five bulk populations from F_2 to F_4 were established. From F_5 generation onwards, 200 progenies were selected.

Thirteen elite rice lines and 6 elite rice lines were evaluated in PYT and MYT respectively. Bg 15-1078 and Bg 15-961 were identified as promising.

Quality rice

Twenty crosses were made. Eighteen populations were advanced to F_2 generation. Thirty six populations of F_3 and F_4 were advanced. Three hundred and ninety five progenies of F_4 to F_7 were advanced.

Twenty six elite rice lines in preliminary yield trial and 6 lines in major yield trial were evaluated. IRRI 156, IR04A395 and WAS-169-B-B-4-2-3 were identified as promising lines.

Thirty progenies were selected from mutant material of M6 of 3 rice varieties (Suwandal, Bg 94-1, Bg 1165-6) further advancement.

Stress tolerant rice

Ten back crosses for salinity stress tolerance were done and 10 BC_1F_1 populations were planted. Ten F_2 populations were established.

Ten crosses were done to incorporate the low moisture stress tolerant character to popular rice varieties. Twenty populations from F_2 to F_4 were established and 16 populations were advanced.

Six crosses were done to incorporate the high temperature tolerant character to popular rice varieties.

Two BC_1F_1 populations of 5 back crosses that were made for the development of BPH resistance advanced lines were phenotypically

screened. In the resistant populations, six homozygous plants were identified.

Hybrid rice

New promising CMS line was identified (BgCMS5A). In addition, three potential CMS lines were developed.

Fifty one CMS lines, 50 maintainer lines and 181 restorer lines were maintained. 198 new crosses were made with selected parental lines.

75 new F_1 combinations were tested in test cross nursery. Out of them, 55 crosses were selected for back crossing in order to develop new CMS and maintainer lines.

Advanced back cross combinations (BCNi – 55, BCNii – 5, BCNiv – 19 and BCNv – 35 populations) were evaluated with their pollen parents.

F_1 hybrid and F_2 hybrids of Bg407H and HR-10 (elite hybrid) were evaluated and that F_1 hybrids gave higher yield than their F_2 hybrids.

Two exotic hybrids (CH1 and CH2) were evaluated and found to be inferior to inbred varieties. They showed standard heterosis of 14.67% and 3.66% respectively.

F_1 seeds of Bg 407H and recently developed hybrid Bg CMS 4A/R147 were produced.

Nuclear seeds (7 kg each) of Bg CMS1A/1B and Bg CMS 4A/B promising hybrid combinations were produced.

Floral characteristics of 16 inbred varieties were studied in order to select the varieties which were suitable to develop new CMS lines. Bg 250 showed highest pollen sterility (9%) and Bg 305 showed lowest pollen sterility (2%) in Yala 2016.

120 progenies of MA2, 120 progenies of farmer field selected line (named as Pallegama) and 250 progenies each of 1B and 4B lines were maintained.

Rice varietal improvement through biotechnology

Three BC_2F_2 populations of Bg 352 and Bg 357 produced by back crossing with 3 donors (DSN22, CNI24 and 'Kola nethi vee') for developing drought tolerant introgression lines were screened.

Tolerant seedlings of BC_2F_2 populations of Bg 358 produced by back crossing with Ciharang+AG1 and IR64+AG1 for developing anaerobic condition tolerant introgression lines were genotyped.

BC_2F_2 population of Bg 366 produced for developing anaerobic condition tolerant introgression lines were screened.

Eleven BC_2F_7 lines of Bg 360, twelve BC_2F_7 lines of Bg 455 and sixteen BC_2F_7 lines of Bg 379-2 that are having submerge tolerant trait were identified.

Thirty seven lines were selected from BC_2F_1 populations of Bg 352 and Bg 357 that were obtained by backcrossing with IRBB 60 and IRBB 65 for developing BLB tolerant introgression lines.

Eight crosses were made using Bg 358, Bg 352, At 362 and Bg 300 as recurrent parents and IRBB60 and IRBB65 as donors to develop advanced BLB resistant lines of these rice varieties

Six crosses were made using Bg 366, Bg 352, Bg 94-1 and Bw 367 as recurrent parents with IR65482-4-136-2-2 and IR71033-121-15 as

donors to develop advanced BPH resistant lines of these rice varieties.

Plants in BC_3F_2 populations obtained by back crossing of 'Pokuru samba' and Bg 94-1 with Tetep and IRBB60 as donor parents of Blast and BLB resistance respectively were selected using both morphological characters and molecular markers for further advancement.

Fourteen BC_2F_5 lines of Bg 300 obtained by back crossing with 'Pokkali' for developing salinity tolerant introgression lines were identified.

Ten BC_2F_4 lines of Bg 360 obtained by back crossing with 'Suwandal' for developing fragrant introgression lines were identified.

Grain Quality

One hundred and fifty samples of NCRVT entries and 380 samples of advanced breeding materials were tested major grain quality characters and found that grain quality of all lines were within acceptable level.

Grains of 14 'Suwandal' accessions available at PGRC were analyzed for physical and physico-chemical properties. Wide range of variability was observed in these accessions.

Analysis of grain samples of rice varieties selected as having potential for export based on physical appearance showed that Glycemic Index of Bw-Bs-1-2-3-1 and At 311 were low, At 362, Bg 360, Bw 272-6B, 'Pachchaperumal' and At 306 were intermediate, and At 309 and 'Suwandal' were high.

Analysis of traditional and improved varieties showed that Bw 272-6B, 'Kalu Heenati', 'Pachchaperumal', 'Deweraddiri', 'Suduru samba' and 'Masuran' had higher percentage of total dietary fiber, red pericarped varieties had higher antioxidant content and activity than white pericarped varieties, and 'Deweraddiri', 'Masuran', 'Kahatawee', 'Dik Wee', 'Madathawalu', 'Kalu Heenati', 'Wanni Dahanala', 'Sudu Heenati', 'Pokkali', 'Herathbanda', 'Hondarawalu' and Bw 272-6B had higher antioxidant properties among the evaluated varieties.

Blends of At 311 with Bg 360, At 311 with Bg 373, Bw 272-6b with 'Suwandal', Bw 272-6b with Bw 367, 'Pachchaperumal' with Bg 300 and Ld 368 with 'Suwandal' were identified to be good raw rice blends.

A new formulation of milk shake developed by incorporating stabilized rice bran of At 362 was further developed using pineapple and wood apple in order to include their flavors.

Disease Management

Total of 605 entries were screened against BLB disease in both seasons. Among them, 1 entry in Maha and 12 entries in Yala were categorized as moderately susceptible and moderately resistant respectively.

Total of 4083 entries were screened against rice blast disease. However, disease did not occur in both seasons.

Pest Management

Collection of rice thrips and paddy bug counts in order to identify the seasonal variation was continued and variation similar to previous year was seen in this year also.

Two thousand six hundred and eighty four rice breeding lines were screened in order to identify lines resistant to gall midge. Four hundred and eighty five lines were identified

as resistant (R) while 1474 lines were identified as resistant/ moderately resistant (R/MR).

Forty four recommended varieties were screened against gall midge. Thirty five varieties were identified as R and R/MR while 4 varieties were identified as MR.

Twenty quality rice varieties/ lines were screened against gall midge and thrips. Among them, 10 varieties were identified as R and others as MR for thrips. Eight lines were identified as moderately resistant/ moderately susceptible (MR/MS) and 12 as MR for gall midge.

Twenty five $2^1/_2$ month promising lines were screened for thrips. Nineteen lines were identified as MR/MS and 6 as MR.

Two thousand six hundred and seventy two entries were screened in order to identify lines resistant to brown plant hopper (BPH) and 302 entries were identified as R.

Effectiveness of Buprofezin and Diacinon for rice thrips, and Ethiprole for BPH were retested using standard product available in market and confirmed that they all are effective to control the respective pests.

Temporal variation of rice insect pests was studied using light trap collections. Peak BPH population was found when the maximum and minimum temperatures were 31.8 ± 1.88^0C and 21.6 ± 1.52^0C respectively.

Release rate of *Trichogrammatoidea bractae*, an egg parasitoid of rice leaf folder at the rate of $1x10^6$ parasitoid adults/ha could reduce the leaf folder damage by 55%.

Impact of flowering plants on the enhancement of natural enemy populations in ecological engineering concepts was assessed by maintaining a flower border consisting with *Tagets lemmonii* and *Zinnia elegans* species in rice fields and revealed that establishment of flowering plants surrounding the rice fields significantly increased the predators and parasitoids availability within rice field.

Insect population was monitored weekly basis by using light and yellow sticky traps. During the study period, very low plant hopper population was observed. But higher spider population was observed throughout the study period.

Insecticidal activity of 06 *Bacillus thuringiensis* (*bt)* strains was tested over the rice leaf folder under laboratory conditions and found that performance of two *bt* strains (AB125 & AB 142) were better.

Weed Management

Four new candidate herbicides for rice (Butachlor 60% EC, Metamifop 10% EC followed by Sulfentrazone 480 g/l SC, Rinskor 2.5 % EC and Metamifop 10% EC followed by Carfentrazone Ethyl 40% WDG) were evaluated for their bio efficacy. All herbicides showed significantly higher bio-efficacy compared to no-weeded control. They were nominated for the pilot scale testing.

Bio efficacy of recommended herbicides namely Pretilachlor 300g/l EC, Pyrazosulfuron ethyl 10% WP, Metamifop 100 g/l EC followed by Ortho-sulfamuron 50% WG, Fenoxaprop-p-ethyl 69g/l EC + Ethoxysulfuron 20g/l OD, Metamifop 100 g/l EC followed by Pyrazosulfuron-ethyl 10% WP, Metamifop 100 g/l EC followed by Carfentrazone ethyl 40% WG, Metamifop 100 g/l EC and Pyribenzoxim 50 g/l EC was

studied. These herbicides gave more than 80% weed control efficiency (WEC).

Bio efficacy of recommended herbicides belonging to Sulfonyl Urea Group (SUGH) namely Pyrasosulfuron ethyl 10% WP, Fluceto-sulfuron 10% WG, Fenoxaprop-p-ethyl 69 + Ethoxysulfuron ethyl 20 OD, Metamifop 100 g/l EC followed by Pyrasosulfuron ethyl 10 %WP, Mefenacent + Bensulfuron-methyl 500 + 30 g/kg WP, Propyrisulfuron 10% SC, Azimsulfuron 50%(W/W) DF and Metamifop 100 g/l EC followed by Orthosulfamuron 50% WDG were evaluated for their bio-efficacy and found effective.

Weed Competitiveness of Bg 352, AERON 9-3, IR 09N247, AERON 10-26, Zhonghua-1, At 10-1240, Bw 11-3403, At 306, 'Suwandal' and At 10-1327 was evaluated .AERON 9-3, AERON 10-26, At 10-1240, Zhonghua-1, Bw 11-3403 and At 10-1327 were found to be highly weed competitive.

Seed germination of soil seed bank was evaluated under 4 different temperature regimes namely 25^{O}C, 30^{O}C, 35^{O}C and 40^{O}C. Results revealed that seed germination increased up to 35^{O}C at increasing trend and at decreasing trend thereafter.

Application of pre-emergent (Pretilachlor 300 g/l EC) followed by post-emergent (Pyribenzoxim 50 g/l EC) herbicides was evaluated against two single herbicide applications (Pretilachlor 300 g/l EC and Oxyfluorefen 240 g/l EC) for the control of weeds in wet seeded rice and found that application of pre-emergent followed by post emergent herbicides was more effective.

Five weed control practices namely Pretilachlor 300 g/l + Pyribenzoxim 20 g/l followed by weedering twice, Pretilachlor 300 g/l + Pyribenzoxim 20 g/l, Pretilachlor 300 g/l EC, Pretilachlor 300 g/l EC followed by weedering twice and weedering twice (at 2 and 4 weeks after transplanting) were evaluated against hand-weeding and no-weeding in machine transplanted rice cultivation. Pretilachlor 300 g/l EC performed well among all herbicide application practices. Weedering was effective in managing weed population below the economic threshold.

Resistance development in *Cyperus iria, Cyperus difformis* was studied using weed populations continuously exposed and un-exposed to Bispyribac sodium. Results revealed that these weed species had built up resistance to Bispyribac sodium.

Soil Fertility Management

Testing of performance of traditional rice cultivars under organic farming showed that 'Sudu Heenati' and 'Madathawalu' gave 4.3 t/ha and 4.1 t/ha yields respectively. Grains of these cultivars contained low Cd (0.1 ppm), and high Fe (33.0 and 33.5 ppm) and Zn (32.5 and 37.2 ppm).

Forty four rice varieties grown under organic farming showed that Zn and Fe contents in grains of rice varieties varied widely ranging between 25-41 ppm and 23-168 ppm respectively.

New fertilizer materials; Zumsil, Give But, Laurence's Liquid Fertilizer, Rotunda A, Rotunda B, CIC Sulfonite, CIC Micro V, Opex product Paddy 1, Opex product Paddy 2, Amino Qualentzn, Leilli and Agrogain were tested. Among all materials, Leilli, Zumsil and

CIC Sulfonite gave 2.8%, 1.4% and 1.4% yield increase compared to without fertilizer respectively in unfertile soil. When these fertilizer materials were applied on top of DOA chemical fertilizer recommendation, CIC Sulfonite, Laurances Liquid Fertilizer, Opex product Paddy 1, Amino Qualentzn, Rotunda A, Opex product Paddy 2, Rotunda B and CIC Micro V gave 26%, 26%, 18%, 13.7%, 10%, 9%, 5%, and 2% yield increase compared to DOA chemical fertilizer recommendation respectively. However, when they were applied on top of DOA chemical fertilizer recommendation and 10 t/ha compost, there was no yield increase compared to DOA chemical fertilizer recommendation and 10 t/ha compost.

Study conducted to evaluate 2 liquid fertilizers, Bio film bio fertilizer and Wuxal Terios Zn, showed that they gave a positive effect when applied with DOA fertilizer recommendation.

Water Management and GIS

Seed broadcasting, transplanting and seedling broadcasting crop establishment methods under 4 different draining levels of alternative wetting and drying (AWD) were studied and found that they all gave same crop yields.

Study conducted with the help of provincial Department of Agriculture to test the adaptability of AWD on 'yaya' basis in Kurunegala district showed that number of irrigations could be reduced by 2-5 irrigations.

Effect of water stress on rice varieties Bg 300, At 303, Bg 304, Bg 305, At 306, At 307, At 308, At 309, Bg 310, Bg 09-1851 and HR 10 was evaluated. Bg 304 performed best followed by Bg 300, Bg 310 and Bg 09-1851 when there was water stress from flowering to maturity and panicle initiation to flowering respectively.

Study conducted to find out the most critical stage and the duration of water stress that effect on rice yields using Bg 304 as the test variety found that plants could tolerate water stress for 3 weeks, 2 weeks and 1 week at early vegetative, late vegetative and reproductive stage respectively.

Study conducted on productivity improvement of rainfed paddy fields showed that Bg 300 followed by Bg 304, Bg 250 and Bg 251 performed well. Addition of organic matter contributed to improve the productivity.

Behavior of weeds under different water regimes at the early stage of the crop in machine transplanted rice was studied. Field water level was maintained at 5 cm above the ground, at ground and at 5 cm below the ground for one week, two weeks and 3 weeks duration. Sedges were less in 5 cm high field water level at 4 weeks after establishment. There was no significant difference in broad leaves at 4 or 6 weeks after establishment. Maintenance of 5 cm of water level for one week was found to be the best water regime among all to manage weeds.

Soil Phosphorus (P) map for Polonnaruwa district was prepared which can be used as an alternative tool to decide the P fertilizer requirement for site specific nutrient management.

Agronomy

Twenty three new rice lines were tested under NCRVT program. Bg 10-2881, Bg 13-1265 and AGT 17 under 2½ months, Bw 11-3403

and At 10-1374 under 3 months, AERON 9-3 and Zhonghua-1 under 3½ months maturity group were selected for further testing in VAT program.

Adaptability of 10 new rice lines was tested under VAT program. Among the lines tested, Bg 08-1909 (4 months rice line) was found to be more adaptable and so promoted to LSVAT.

Two fertilizer recommendations generated using Rice Crop Manager – ICT tool developed by IRRI were tested for refinement of the tool. It was revealed that there was no significant yield difference against DOA fertilizer recommendation.

Combining of adjacent small plots to make plots large within one land parcel was tried in Kalinga ela village in Polonnaruwa. It was found that 4% land lying under bunds could be recovered and 2 labor days/ha could be saved on average indicating that the productivity and profitability of rice farming could be increased by this method.

Bg 14-2848 and Bg 14-2450 rice lines were tested against IRDTN 7-11 and Bg 300 for drought stress condition. Both lines were identified as suitable for drought stress condition.

Twenty rice varieties were tested under three temperature treatments; ambient/control <35 ^{o}C, 35-37 ^{o}C and 38-40 ^{o}C a thermo-gradient chamber to identify rice varieties with high temperature tolerance. There was a difference in pollen sterility among temperature regimes but not among varieties. Bg 359, 'Suwandal', 'Pachchaperumal' and 'Pokkali' started flowering before 7.30 a.m. while Bg 94-1, Bg 352, Bg 357, Bg 358, Bg 360, Bg 369 and 'Kalu Heenati' flowered during 7.30-10.30 a.m. Bg 304, 'Suwandal', 'Pachchaperumal', 'Kalu Heenati' and 'Pokkali' had both higher filled grain percentages and yields/hill in all three temperature regimes indicating their ability to tolerate high temperature compared to other varieties.

Nineteen rice lines and varieties were tested for their adaptability to cold condition in Bandarawela. H4, CL 508, PL 20, Bg 403, Bg 379-2, PL 16, CL 411, Bg 94-1, CL 305 and CL 107 showed high filled grain percentage and yield, and identified as adapted varieties to the area.

Performance of Bg 300, Bg 310, At 308, Bg 250, IR 64+AG1 and IR 64 established and maintained under flooded condition was evaluated. Bg 300, IR 64+AG1 and IR 64 had the highest seedling density and panicle density, while Bg 300, IR 64+AG1, IR 64, Bg 310 and At 308 gave significantly higher yields under flooded condition compared to saturated condition.

Effect of flooding depth for rice established under submerged condition was tested using Bg 300 and IR64+AG1 rice varieties. Seedling and weed densities were significantly lower in 5 cm flooding depth than that in 2.5 cm flooding depth (43% and 61% respectively). Leaf greenness, panicle density and yield were not different between 2 flooding depths. Establishment of rice under submerged conditions with 5 cm water depth was better than establishment with 2 cm water depth.

Several trials were conducted to identify suitable management package for machine transplanting. Rice varieties Bw 367, Bg 366, Bg 357, Bg 300, Bg 406 Bg 379-2 and Bg 403 gave higher yields and performed well with

mechanical transplanting. There was no significant difference in yields among the spacing levels or seedlings number/hill indicating the possibility of using higher spacing with lower number of seedlings/ hill which also leads to minimize seed paddy requirement for mechanical transplanting. Yield was also not differed with depth levels. This reveals the possibility of using a range of different depths in mechanical transplanting depending on the existing soil type.

SEED PRODUCTION

Following amounts of breeder seeds were produced.

Table 1.4.2: Amount of breeder seeds produced

Age class and variety	Seed Quantity (kg)		
	Maha 2016/16	Yala 2016	Total
150-180 days			
Bg 3-5	160.0		160.0
Bg 745	160.0		160.0
Bg 38	140.0		140.0
Bg 407	130.0		130.0
4 months			
Bg 379-2	123.0	41.0	164.0
Bg 450	61.5		61.5
Bg 403	61.5	61.5	123.0
Bg 406	20.5	20.5	41.0
Bg 455		41.0	41.0
$3^1/_2$ months			
Bg 94-1	143.5	123.0	266.5
Bg 352	164.0	205.0	369.0
Bg 357	41.0	61.5	102.5
Bg 358	164.0	102.5	266.5
Bg 359	123.0	82.0	205.0
Bg 360	184.5	205.0	389.5
Bg 366	184.5	266.5	451.0
Bg 369	61.5	20.5	82.0
Bg 370	164.0	61.5	225.5
3 months			
Bg 300	82.0	328.0	410.0
Bg 310	41.0	102.5	143.5
80 days			
Bg 250	20.0	50.0	70.0
Bg 251	60.0	40.0	100.0
Total	**2,289.5**	**1,812.0**	**4,101.5**

The following quantities of purified seeds of traditional rice varieties were produced.

Table 1.4.3: Amount of purified seeds produced

Variety	Seed Quantity (kg)		
	Maha 2015/16	Yala 2016	Total
Sudu Heenati	60	50	110
Kalu Heenati	40	40	80
Suwandal	40	40	80
Pachchaperumal	66	30	96
Madathawalu	125	50	175
Pokkali	44	60	104
Kuruluthuda	60	-	60
Suduru samba	20	40	60
Herath Banda	4	30	34
Murungakayan	40	50	90
Beheth Heenati	20	30	50
Rathel	30	-	30

- 1,466 kg of paddy seeds of traditional varieties were produced and sold to farmers.

- 940 bushels of seed paddy (foundation, registered and certified) of popular varieties were produced and gave out.
- 1,260 bushels of paddy was produced.

SPECIAL PROJECTS

Following projects were implemented.

- National Food Production Program
  - Development of BPH and GM resistant rice varieties
  - Development of BLB resistant rice varieties
  - Productivity improvement of rice
- Small Scale Research and Development projects
  - Green super rice (Funded by IRRI)
  - Closing rice yield gap in Asia (Funded by IRRI)
  - Increasing productivity of direct seeded rice areas by incorporating genes tolerant to anaerobic germination (Funded by IRRI)
  - Management of weeds and weedy rice in direct seeded rice (Funded by IRRI)
  - Weedy rice management and characterizing/ quantifying of herbicide resistance in weeds (Funded by IRRI)
  - Establishment of a model farming village for high quality and high productivity of rice in Sri Lanka (Funded by KOPIA)
- National Agricultural Research Plan projects
  - Development of rice varieties for abiotic stresses
  - Determination of phosphorus fertilizer requirement for rice
  - Identification of biotypes of brown plant hopper
  - Development of locally adaptable Cytoplasm Male Sterile (CMS) lines
  - Development of integrated management method for rice field rats
  - Development of new salinity tolerance rice lines to improve rice productivity
  - Development of BPH resistant new rice lines as eco-friendly approach for BPH management
  - Introgression of heat tolerance to mega rice varieties in Sri Lanka to develop new segregating populations
  - Investigation of patho type diversity of the bacterial leaf blight pathogen *Xanthomonas oryzae* pv. *oryzae* in Sri Lanka.

TECHNOLOGY DISSEMINATION

- Field demonstrations and farmer awareness programs for the establishment of a model farm village in Yaya 09, Rajanganaya was continued. Accordingly, different establishment methods (seedling broadcasting, machine transplanting, hand transplanting), machine transplanting using different rice varieties (Bg 310, Bg 370, Bw 367, At 362, Bg 359 and Bg 360) and weedy rice control package were demonstrated.
- Eleven awareness programs (2 on seedling broadcasting, 1 on laser leveling, 3 on land preparation and 5 on alternative wetting and drying technique) for farmers were conducted.
- One hundred and eight training programs of different levels for different types of trainees were conducted by the RRDI for

total of 5259 participants as given below. It included special 2 day training on Rodent identification and ecologically based rodent management.

Table 1:4:4 Summary of training programs conducted in 2016

Type of Program	No. of Programs	No. of Participants
Farmer trainings (one day)	20	870
Officer trainings	38	1,644
Diploma student trainings	10	474
University student visits	09	364
School children visits	31	1,907
Total	**108**	**5,259**

- Seven hundred and forty soil samples received under soil test based fertilizer recommendation program and National Food Production Program were analyzed and test result base inorganic & organic fertilizer recommendations were issued.
- Twenty four samples brought by farmers were inspected for diagnosis of pests and diseases, and appropriate instructions were given for the control of pests and diseases
- Five farmer fields were inspected for diagnosis of pests and diseases, and instructions were given for the control of pests and diseases.
- Four radio programs related to rice cultivation were participated.
- Technical support was provided for one video program telecast.
- Officers attended as resource persons for10 trainings organized by the other organizations / units of DOA.

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- 3rd Annual Review and Planning Meeting of CORIGAP Project. 22–26 Feb. 2016, Yogyakarta, Indonesia.
- Master in Advance Science in Integrated Crop Management. 03 March – 23 Nov. 2016, University of Neuchatel, Switzerland
- International Program on Improved Technologies for Productivity Enhancement of Fruit Crops and Saline Tolerant Paddy. 23–26 March 2016, National Inland Fisheries and Aquaculture Training Institute, Kalawewa.
- Participatory Approaches for Managing Agricultural Biodiversity Training for Trainers. 26–29 April 2016, PGRC, Gannoruwa.
- Training on Hybrid Rice Comprehensive Technology Intensification for Developing Countries. 11 May – 8 Aug. 2016, Changsha, China.
- Post Harvest Technologies for Developing Countries. 20 May – 25 June 2016, Changsha, China.
- Regional Training Workshop on Use of Statistical Downscaling and AquaCrop Simulation Modeling Tools for Climate Change Impact Studies. 31 May - 4 June 2016, Kandy.
- Marker Assisted Breeding (MAB) Training for Department of Agriculture, Sri Lanka. 15–22 June 2016, Agricultural Biotechnology Center, University of Peradeniya.
- Training Workshop on Rice Technology Transfer Systems in Asia. 19th June – 2nd July 2016, South Korea.

- Training on Hybrid Rice Comprehensive Technology Intensification for Developing Countries. 8th July – 4th Aug. 2016, Changsha, China.
- Training on Phenotyping and Genotyping Mutants for Abiotic Stresses. 18–22 July 2016, RRDI, Batalagoda.
- Training on ArcGIS 10.4.1 Software. 25–29 July 2016, GIS Solutions (Pvt) Ltd, Kollupitiya.
- 20th Annual Council for Partnerships on Rice Research in Asia (CORRA) Meeting. 25-26 Oct. 2016, South Korea.
- Fellowship Training on Rice Breeding. 4 Sep. – 1 Nov. 2016, IRRI, Philippines.
- Closing Workshop on Increasing Productivity of Direct-Seeded Rice Areas by Incorporating Genes for Tolerance of Anaerobic Conditions during Germination Project. 5-6 Sep. 2016, IRRI, Philippines.
- Training on Green Super Hybrid Rice Variety Breeding, Production and Cultivation Technology for Developing Countries. 10–26 Sep. 2016, Changsha, China.
- Annual Congress of the Postgraduate Institute of Agriculture -2016. 17-18 Nov. 2016, PGRC, Gannoruwa.
- Sustainable Rice Platform 6th Plenary Meeting and General Assembly. 7–9 Dec. 2016, Singapore.

OTHER ACTIVITIES

- Modification of existing paddle thresher was undertaken to improve its performance under National Science Foundation grant No.; TG/2015/Tech-D/02. The modified paddle thresher has a lid for the rotating drum and seed collection box with easy operation over the existing paddle thresher.
- Seven hundred and fifty rice accessions including traditional cultivars, introductions and improved lines were established and dried seed samples were conserved at RRDI short term germplasm conservation unit.
- 200 sets of seed samples were distributed among other research stations, schools, universities, NGOs and other interested group according to their request.
- Facilities were provided for 24 students of agriculture schools/technical college and 11 university students to carry out their in plant trainings as a partial fulfillment of their respective course under the supervision of officers of RRDI.
- Facilities were provided for 4 undergraduate students to carry out their research projects under the supervision of officers of RRDI.
- Facilities were provided for 15 seminars / meetings with 659 attendees.
- Various publications of the DOA worth of Rs. 93,859.00 were sold at the outlet at RRDI.
- The new laboratory building constructed under the Infrastructure Development of RRDI project was declared open on 4 August 2016.

PLAN FOR 2017

Research

- Development of elite lines of $2^1/_2$, 3, $3^1/_2$, and $4\text{-}4^1/_2$ months age groups through conventional breeding for favorable conditions.

- Evaluation of elite rice lines of $2^1/_2$, 3, $3^1/_2$, 4-$4^1/_2$ and 5-6 months age groups in Preliminary Yield Trials and Major Yield Trials.
- Multiplication of elite rice lines (advanced generations) of $2^1/_2$, 3, $3^1/_2$, 4-$4^1/_2$ and 5-6 months age groups.
- Development of abiotic stress tolerant (drought/ submergence/ anaerobic germination/ high temperature/ salinity) and quality elite lines through conventional/ back crossing and marker assisted selection or mutation breeding
- Development of new hybrids through heterosis breeding.
- Evaluation of *Oryza rhizomatis* accessions for drought tolerance.
- Conservation of germplasms through multiplication.
- Screening of rice varieties for salinity, drought, high temperature, cold, submergence and anaerobic germination tolerance.
- Screening of breeding lines and new introductions for important pests and diseases.
- Assessment of heavy metal contents in grains of rice cultivated under organic condition.
- Testing of new fertilizer materials.
- Investigations on pathotype diversity of bacterial leaf blight pathogen.
- Testing of new pesticides/fungicides for major pests/diseases of rice.
- Studies on population dynamics of rice thrips and paddy bug.
- Studies on major rice-field-rat species and their abundance.
- Evaluation of new herbicides for rice
- Investigation of methods to control weeds in rice.
- Evaluation of breeding lines for Nitrogen response.
- Evaluation of elite rice lines in National Coordinated Rice Varietal Testing Program.
- Validation of varieties, planting distance, seedlings/hill and planting depth for mechanical transplanting of rice.
- Effect of water depth, seed rate and application of herbicide for rice germinated under submerged condition.
- Evaluation of Alternate Wetting and Drying (AWD) technique.
- Evaluation of climatic suitability for rice cultivation.
- Identification of critical growth stage and the duration of moisture stress on rice.
- Modeling of yield in NCRVT locations (APSIM Oryza and Aqua Crop).

Seed Production

- Production of breeder seeds of 24 recommended rice varieties.
- Multiplication of 7 rice varieties.
- Multiplication of 22 elite lines.
- Production of purified seeds of 12 selected traditional rice varieties.
- Production of seed paddy of popular rice varieties.

Special Projects

- Management of weeds and weedy rice in direct seeded rice in Sri Lanka.
- Green super rice.
- Closing rice yield gap in Asia.
- Establishment of model farm village.
- Productivity improvement of rice.

- Development of rice varieties for abiotic stress.
- Determination of phosphorus fertilizer requirement.
- Development of locally adaptable Cytoplasmic Male Sterile (CMS) rice lines.
- Development of new salinity tolerant rice lines.
- Development of BPH resistant new rice lines as eco-friendly approach.
- Introgression of temperature tolerance to mega rice varieties in Sri Lanka
- Investigation of pathotype diversity of the Bacterial Leaf Blight pathogen.
- Development of integrated management method for rice fields' rats.

Technology Dissemination

- Trainings on rice breeding, rice varieties, seed paddy production for field officers of DOA, university students, students of agriculture schools, farmers and school children.
- Rice germplasm multiplication of conservation.
- Soil test based fertilizer recommendation.

RICE RESEARCH STATION – AMBALANTOTA

RRS, Ambalantota is responsible for development of red-pericarp salinity tolerant rice varieties. The station is also responsible for developing related technologies to improve productivity in saline area and producing of breeder seeds of recommended "At" varieties.

PROGRESS

RESEARCH

Rice varietal improvement

3 month age class

Twenty five new crosses were made. Forty one early segregating generations were selected and maintained separately. From F_5 generation onwards, about 1050 progenies were maintained and 700 were selected for generation advancement.

Fifteen lines were evaluated in PYT and 8 lines were selected to MYT. Fourteen lines were evaluated in MYT and 3 lines (At 14-797, At 14-713, At 13-1338) were selected for nominating to NCRVT.

At 13-3048 (red long medium grain type variety), At 13-2715 (red long slender grain type variety), and At 13-1543 (white long medium grain type variety) were identified as promising lines and nominated to evaluate in NCRVT.

At 10-1374 (red long medium grain type variety) was selected for VAT.

3½ month age class

Sixty eight crosses were made. From F_5 generation onwards, 130 progenies were established and 76 were selected for further evaluation.

Ten promising lines were selected to test yield potential in PYT and 7 lines were selected from PYT to further evaluate in MYT.

At 09-898 (white, aromatic, fine grain) was selected for LSVAT program.

Agronomy

Two trials were conducted in each Maha 2015/16 and Yala 2016 under NCRVT program. Ten new rice lines were tested with standard check varieties during Maha. At 10-1374, At 10-1240 and At 10-1327 were found In Yala 2016 another ten new rice lines were tested with standard check varieties. At 11-1425, At 13-3791, At 13-3048, At 13-1543 and At 13-2715 were found promising.

Twelve trials for testing adaptability of new elite lines namely At 10-1350 and Bg 11-802 were conducted in Matara and Hambantota districts during two seasons. At 08-898 found to be more adaptable than that of the standard check variety.

Seven varieties including four red pericarp (At 362, At 311, At 353, At 1078) and three white (At 309, At 405, At 354) were analyzed for glycemic index under two degrees of polishing (30 and 60 %). GI ranged from low to medium. None of them recorded high GI. Grain carbohydrate, amylose, fat, crude fiber and ash contents had no influence on GI. 60% degree polishing from 30% degree polishing reduced the GI from intermediate to low as the grain protein content increased. However, influence of degree of polishing on GI was variety dependent.

Hermetic bag and PET 10/LLDPE 60 bag were tested against common poly-sack for storing rice after milling. Most of the rice grain quality parameters could be maintained favorably in PET 10/LLDPE 60 bag and hermetic bag compared to poly sacks. PET 10/LLDPE 60 bags found to be better than hermetic bags because hermetic condition in hermetic bags was lost later on due to insect damages.

Weed Science

Bg 300, Bg 94/1, Bg 379/2, Bg 455, H4, Bg 352, Bg 360, Bw 364, Bw 367, Bw 372, Ld 368, Ld 371, At 307, At 308, At 354 and At 362 rice varieties were evaluated for establishing under 5 cm flooded condition. At 362, Bw 367, At 308, At 307 and Bg 455 had higher seedling count and higher yield under submerged condition indicating that those were more suitable for establishing under flooded condition. Establishment under flooded condition reduced grasses and sedge biomass by 84% and 72% respectively thus it could used to manage weeds in rice.

In a survey conducted with 100 farmers in Hambantota district, it was found that repetitive use of same mode of action herbicide had caused poor weed control efficacy in farmers' fields. Herbicides having Acetolactate synthase (ALS) mode of action were most widely used (70%). More than 85% of the farmers used 2 to 3 herbicides together as mixtures. Among the herbicide mixtures, Metamifop 10% EC + Carfentrazone–ethyl 240 g/l EC, Bispyribac sodium 40g/l + Metamifop 100g/lSC + Carfentrazone–ethyl 240 g/l EC and Bispyribac sodium 40g/l + Carfentrazone–ethyl 240 g/l EC were the most popular.

Transplanting, seedling broadcasting, random broadcasting and direct row seeding were evaluated. Weed emergence and growth in seedling broadcasting was 89% lower compared to random sowing suggesting that among the crop establishment method, seedling broadcasting is more effective in managing weeds in rice.

Flooding up to 3 cm height of rice at 0, 3 and 7 days after transplanting was studied against

non flooding. More than 50% lower weed density was observed in flooded condition compared to saturated condition. It was found that flooding up to 3 cm at 0 and 3 days was effective to control weeds in mechine transplanted rice.

SPECIAL PROJECTS

Following projects were implemented.

- Improvement of Grain Quality Attributes of Rice Varieties (Funded by NARP).
- Integrated Weed Management Approach in Direct Seeded Rice (DSR) to Reduce the Herbicide Dependency and Yield Losses due to Weeds in Hambantota District (Funded by NARP).

TECHNOLOGY DISSEMINATION

- Trainings were given to students of Agriculture Schools as a partial fulfillment of the Diploma course
- Information was given to university students, technical staff of DOA, school children, and farmers who visited the institute.
- Facilities were provided to 2 undergraduate students and 2 post graduate students to carry out their research project.
- Nineteen awareness programs on effective weed management in rice cultivation were conducted for farmers and officers of the Department of Agriculture.

BREEDER SEED PRODUCTION

Following amounts of breeder seeds were produced.

Table 1.4.5: Amount of breeder seeds produced

Variety	Seed Quantity (kg)		
	Maha 2015/16	Yala 2016	Total
3 months			
At 307	120	140	260
At 308	120	140	260
3½ months			
At 354	60	40	100
At 362	220	240	460
At 373	-	80	80
Total	**520**	**640**	**1,160**

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- Regional Training Course on Capacity Development of Hybrid Rice in Asia. People's Republic of China.
- Hybrid Rice Comprehensive Technology Intensification for Developing Countries. People's Republic of China.

PLAN FOR 2017

- Development of elite lines of 3 and $3^1/_2$ months age groups through conventional breeding for favorable conditions.
- Evaluation of elite rice lines of 3 and $3^1/_2$ months age groups in Preliminary Yield Trials and Major Yield Trials.
- Multiplication of elite rice lines (advanced generations) of 3 and $3^1/_2$ months age groups.
- Production of breeder seeds of recommended At rice varieties.
- Evaluation new rice lines under NCRVT and VAT program.

- Evaluation of rice varieties for glycemic index and related quality attributes.
- Screening of herbicides under National Coordinated Herbicide Screening Trial (NCHST).
- Conducting farmer field survey on weeds and their management in Hambantota District.
- Evaluation of herbicide resistance of *Cyperus difformis* and *Cyperus irria* populations.
- Effect of seed priming on anaerobic germination.
- Screening of rice genotypes to flooded condition.
- Evaluation of weed management package for machine transplanted rice system.

RICE RESEARCH STATION – LABUDUWA

RRS, Labuduwa is responsible for developing red-pericarp rice varieties. The station is also responsible for developing related technologies to improve productivity in high potential mineral soil rice lands in the Low Country Wet Zone and producing of breeder seeds of recommended "Ld" varieties.

PROGRESS

RESEARCH

Varietal Improvement

New rice variety belonging to $2^1/_2$ month maturity group was released as Ld 253. It is a white pericarp, long slender grain type variety suitable for cultivation in areas with short season.

Ten crosses were made and 22 F_1, 9 F2, 8 F_3 and 7 F_4 generations were advanced. One hundred and eighty F_5 lines and 200 advance breeding lines were maintained for the development of high yielding adaptable and quality rice varieties for high potential rice lands in LCWZ.

Twenty six lines were evaluated in PYT and seven lines were evaluated in MYT.

F_2 population of 4 crosses and F_4 populations of 2 crosses were obtained for the development of rice varieties for salinity affected flood prone soil conditions.

Seven hundred eighty seven SSD lines were developed using two crosses, where 'Dahanala' was used as donor parent for thrips resistance.

Agronomy and Soil Science

Two trials were conducted to test 16 new rice lines under NCRVT program. At 12-2715, At 13-3791 and Bg 14-567 were found promising. Among the lines tested under VAT program to evaluate the adaptability, Bg 11-802 and At 10-1350 gave higher yields and showed well adapted than that of the standard check varieties.

Use of 2 t/ha PBRH with DOA recommended chemical fertilizer was found to alleviate Fe toxicity systems of rice.

Plant Protection

Studies conducted for the development of pest forecasting model for rice sheath mite and brown spot in Low Country Wet Zone found that sheath mite population increases with the high temperature and low rainfall.

Study conducted under NCHST, it was found that Butachlor 60% EC, Metamifop 10 % EC *fb* Sulfentrazone 480 g/l SC, Rinskor 2.5 % EC and Metamifop 10 % EC *fb* Carfentrazone Ethyl 40% WDG were effective in controlling weeds in wet-seeded rice.

Ninety two farmers in 10 rice tracts were interviewed and necessary information for the development of e-pest surveillance and intervention system were collected.

Eighty nine rice lines were less infected out of 194 lines in screening of advance breeding lines for brown spot.

Ninety one rice lines out of 787 rice lines were less infected during the field evaluations of the lines obtained from crosses of 'Dahanala' with Ld 368, Bg 300 and Bg 9024 that were made for the development of rice lines resistant to thrips.

BREEDER SEED PRODUCTION

Following amounts of breeder seeds were produced.

Table 1.4.6: Amount of breeder seeds produced

Variety	Seed Quantity (kg)		
	Maha 2015/16	Yala 2016	Total
3½ months			
Ld 365	143.5	41.0	184.5
Ld 368	61.5	61.5	123.0
Ld 371	20.5	41.0	61.5
4 months			
Ld 408	20.5	41.0	61.5
Total	**246.0**	**184.5**	**430.5**

TECHNOLOGY DISSEMINATION

- Participated in 5 day exhibition 'Dakshina Krushi Navodaya' conducted by Agriculture Ministry of Southern Province.
- Supervised 2 M.Sc. level post graduate students' and 1 undergraduate's research projects.
- Provided training to diploma students and undergraduate students for the partial fulfillment of their courses.
- Provided training to school students and farmers.
- Provided solutions for the farmer problems related to different rice varieties, pest and disease and soil and water related problems and fertilizer management.

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- Training on Rodent Identification and Ecologically Based Rodent Management. 25-26 Jan. 2016, RRDI, Batalagoda
- Regional Training on Capacity Development of Hybrid Rice in Asia. 19-30 Oct. 2016, Changsha, China

SPECIAL PROJECTS

Following projects were implemented.

- Establishment of E-pest Surveillance and Forecasting System
- Development of Rice Varieties for Salinity Affected Flood Prone Soil Condition of Low Country Wet Zone
- Management of Climate and Soil Related Problems of Acid Sulphate Soils in Paddy Ecosystems

OTHER ACTIVITIES

- The station won the third place at national productivity awards 2016 conducted by the national productivity secretariat.
- A processing and storing unit, a garage and a new quarter were constructed at the station.

PLAN FOR 2017

- Development of elite lines of 3 and $3^1/_2$ months maturity groups through conventional breeding for favorable conditions.
- Evaluation of advance lines in F_5 generation of the crosses of 'Dahanala' with Ld 368, Bg 300 and Bg 9024 for the resistance to thrips.
- Evaluation of rice lines against BLB.
- Development of pest forecasting model for rice sheath mite in Low Country Wet Zone.
- Screening of herbicides under NCHST.
- Evaluation new rice lines under NCRVT and VAT program.
- Assessment of rice yield limiting soil constraints i.e. Fe toxicity and acidity.
- Study of crop models (DSSAT).
- Production of breeder seeds and basic seeds.

RICE RESEARCH STATION – SAMMANTHURAI

The mandate of the station is to cater the research needs of the rice cultivation in the Eastern Province, especially in the Ampara District and to introduce new rice technologies to increase productivity.

PROGRESS

RESEARCH

Eight F_6 populations were maintained for selecting advance rice lines suitable for Eastern province.

Fifteen new rice lines belonging to 2½, 3 and 3½ month age groups were tested under NCRVT program. Bg 13-1265, AGT 14 and AGT 17 lines showed extra early maturity. AERON 10-25 and AERON 10-05 (3½ month) were found promising.

Ten trials were conducted under VAT program involving 8 new rice lines (IRDTN 07-56, IRDTN 07-07, IRDTN 07-37, At 09-898, At 08-1024, Bw 03-1198, Bg 11-802 and Bg 09-1851) in Ampara District. All new entries showed yield superiority over respective check.

BASIC SEED PRODUCTION

Twenty bushels of Zhonghua and 15 bushels of At 311 were produced.

TECHNOLOGY DISSEMINATION

- Information on rice cultivation was provided to nearly 430 farmers and 36 students from agriculture schools who visited the station.
- Five training programs were conducted at the station for famers, students of agriculture school, Kundasale and students of HARDI, Ampara.
- Conducted demonstrations in farmers' fields on weedy rice management, seedling broadcasting, machine transplanting, use of pre-emergent herbicides and row seeding.

- Participated in 2 radio programs on Use of Organic Fertilizer in Large Scale Paddy Cultivation and Effective Weed Management in Ampara District.

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- Training on Rodent Identification and Ecologically-based Rodent Management. 25–26 January 2016, RRDI, Batalagoda.

PLAN FOR 2017

- Selection of bulk populations to identify promising lines.
- Screening of drought tolerant and heat tolerant short and ultra-short new rice lines.
- Evaluation new rice lines under NCRVT and VAT program.
- Production of basic seeds.
- Dissemination of new technologies.

RICE RESEARCH STATION – PARANTHAN

The mandate of the station is to cater the research needs of the rice cultivation in the Northern region especially in the Kilinochchi, Jaffna and Mullaitivu Districts and to introduce new rice technologies to increase productivity.

PROGRESS

RESEARCH

Nineteen new rice lines were tested in 4 trials under NCRVT program. AGT 17 (2½ months), Bw 11-3403 (3 months), Red 1-2 (3 months), Zhonghua (3½ months) and Bg 09-606 (4-4½ months) were found promising in Maha 2015/16.

Three trials for testing adaptability of 2 new elite lines were conducted under VAT program in Yala 2016. Bg 11-802 (3½ month) gave higher yields and found to be more adaptable.

Eleven crosses were made and 8 F_1 and 3 F_2 generations were advanced. One hundred and thirty breeding lines were maintained.

Twenty purified local and released red pericarp rice varieties were evaluated and a promising red pericarp variety adaptable to the Northern region was identified.

Sowing by dry land rice seeder was evaluated against broadcasting in five farmer fields and found that sowing gave higher yield than broadcasting.

Feasibility of mechanized weeding using motorized weeder in dry drill-seeded rice was found to be as effective as hand weeding.

Sixty rice varieties were evaluated and found that Bw 451, Bw 364 and At 303 among 4, $3^1/_2$ and 3 month maturity duration groups gave highest yields of 7.1, 6.5 and 5.4 t/ha respectively.

Thirty exotic rice lies received from IRRI (Irrigated Lowland Yield Trial) were evaluated for irrigated lowland condition. HHZ10DTSLI1-LI1 and HHZ4DT3Y1-Y1 gave yields of 10.4 and 9.4 t/ha respectively.

Ten lines suitable for aerobic condition were tested and found that CNI 29 and IRDTN 07-11 were promising.

BASIC SEED PRODUCTION

Produced 600 kg of seed paddy of traditional rice variety - Moddaikaruppan.

TECHNOLOGY DISSEMINATION

- Nineteen farmer fields in the northern area were inspected and recommendations were given to solve site specific problems on rice.
- Information was provided to about 250 students of schools from Jaffna, Mullaitivu and Kilinochchi Districts who visited the station.
- Officers served as resource person in many training programs conducted by DATC, Vaddakachchi, Kilinochchi.
- A field day and 2 farmer trainings were held.

TRAININGS, CONFERENCES AND WORKSHOPS ATTENDED

- International Conference on Dry Zone Agriculture. 15-16 Oct. 2016, Faculty of Agriculture, Ariviyalnager, Kilinochchi.
- Jaffna University International Research Conference. 12 - 13 Aug. 2016, Jaffna.

PLAN FOR 2017

- Collection and purification of local land races of rice in northern region.
- Development of short to intermediate duration rice varieties.
- Multiplication of traditional varieties.
- Identification of reasons for yield gap.
- Evaluation new rice lines under NCRVT and VAT program.
- Production of basic seeds.

RICE RESEARCH STATION – MURUNKAN

The mandate of the station is to cater the research needs of the rice cultivation in the Northern region especially in the Mannar District and to introduce new rice technologies to increase productivity.

PROGRESS

RESEARCH

Two trials under NCRVT program were conducted in each 2015/16 and Yala 2016. Eighteen new rice lines were tested with standard check varieties. Bg 10-2881, AGT 14 and AGT 17 (2½ months), At 10-1240, At 13-2 and At 10-1374 (3 months), At -11-1425 (3½ months), Bg-379-2 and Bg -07-997 (4-4½ months) were found promising.

Diazinon in higher doses than the recommended dosage was found to be required for the control of yellow stem borer in rice indicating the possible resistant development by the insect.

BASIC SEED PRODUCTION

Produced 1059 kg of Bg 360.

TECHNOLOGY DISSEMINATION

- Nineteen field visits were made by the officers to solve problems on rice cultivations.
- Advice and recommendations were given for about 130 farmers who visited the station and contacted by telephone.
- A radio program on rice pest and disease management was participated.

- Refresher training was conducted to the plant doctors of North and Eastern provinces under the permanent plant clinic program.
- Two farmer trainings were conducted in Giant tank irrigation office, Murunkan.
- Three seminar classes were conducted on plant protection for 520 students of Mannar district.

PLAN FOR 2017

- Management of rice thrips through disturbances of egg laying.
- Development of a trap for paddy bug.
- Evaluation of Calotropis leaf extract against rice leaf folder.
- Investigation of allelopathic effect of rice varieties on weeds.
- Evaluation of performance of herbicides through change the time of application.
- Screening of herbicides under NCHST.
- Evaluation new rice lines under NCRVT and VAT programs.

STAFF LIST

RRDI, Batalagoda

Designation	No. Existing
Director	01
Additional Director	01
Deputy Director (Research)	01
Assistant Director of Agriculture (Research)	17
Assistant Director of Agriculture (Economics)	02
Assistant Director of Agriculture (Development)	03
Administrative Officer	01
Programme Assistant (Agriculture)	04
Development Officer	05
Agriculture Instructor	17
Research Assistant	22
Engineering Assistant	01
Public Management Assistant	12
Technological Assistant	04
Farm Clerk	01
Warden	01
Driver	07
Tractor Operator	01
Storeman	01
Lorry Cleaner	01
Mechanic	01
Carpenter	01
Technician	01
Research Sub Assistant	04
Cook	02
Circuit Bungalow Keeper	01
Office Employee	02
Watcher	10
Laborer (Permanent)	133
Laborer (Contract)	18
Total	**284**

Rice Research Station, Ambalantota

Designation	No. Existing
Deputy Director (Research)	01
Assistant Director of Agriculture (Research)	01
Program Assistant (Agriculture)	01
Development Officer	04
Research Assistant	02
Public Management Assistant	02
Technological Assistant	03

Designation	No. Existing
Farm Clerk	01
Driver	02
Tractor Operator	01
Research Sub Assistant	01
Watcher	05
Laborer (Permanent)	29
Laborer (Contract)	06
Total	**59**

Rice Research Station, Labuduwa

Designation	No. Existing
Assistant Director of Agriculture (Research)	03
Program Assistant (Agriculture)	01
Development Officer	02
Agriculture Instructor	03
Research Assistant	06
Public Management Assistant	03
Technological Assistant	02
Driver	02
Tractor Operator	01
Office Employee	01
Watcher	03
Laborer (Permanent)	18
Laborer (Contract)	03
Total	**48**

Rice Research Station, Sammanthurai

Designation	No. Existing
Assistant Director of Agriculture (Research)	01
Assistant Director of Agriculture (Development)	01
Development Officer	06
Agriculture Instructor	01
Research Assistant	03
Public Management Assistant	02
Technological Assistant	03
Driver	01
Tractor Operator	01
Office Employee	01
Watcher	05
Laborer (Permanent)	10
Laborer (Contract)	02
Total	**37**

Rice Research Station, Paranthan

Designation	No. Existing
Assistant Director of Agriculture (Research)	01
Agriculture Instructor	01
Development Officer	01
Research Assistant	02
Technical Assistant	03
Driver	01
Tractor Operator	01
Watcher	02
Laborer (Permanent)	07
Laborer (Contract)	05
Total	**24**

Rice Research Station, Murunkan

Designation	No. Existing
Research Assistant	01
Technological Assistant	02
Watcher	02
Laborer (Permanent)	09
Laborer (Contract)	02
Total	**16**

1.4.1 REGIONAL RICE RESEARCH AND DEVELOPMENT CENTRE (RRRDC) – BOMBUWELA

Regional Rice Research and Development Centre (RRRDC), Bombuwela is one of the stations functioning under the Rice Research and Development Institute (RRDI), Batalagoda. Agriculture Research Station (ARS) at Bentota is a substation coming under the purview of RRRDC.

The mandate of RRRDC is to develop and disseminate technologies to increase the productivity of rice in Kalutara, Colombo, Gampaha and part of Galle and Ratnapura with special emphasis on paddy fields with problem soils. The Centre is engaged in developing of both red and white pericarp high yielding varieties with tolerance to biotic and abiotic stresses suitable for the area and production of Breeders' seeds of Bw varieties. In addition, it conducts relevant other technology transfer activities.

BUDGET

Table 1.4.1.1: Annual Budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	4,885,000	4,832,454	99
Capital	7,517,238	6,891,063	92
Projects			
• Investigation of patho-type diversity of Bacterial Leaf Blight pathogen *Xanthomonas oryzae* pv. oryzae	902,900	735,760	81
• Role of allelo-chemicals in rice (*Oryza sativa*) responsible for reproductive maturity of paddy bug	235,600	234,260	99
Total	**13,540,738**	**12,693,537**	**94**

PROGRESS

RESEARCH

Rice Varietal Improvement

RRRDC continued its efforts to develop high yielding rice varieties with tolerance to abiotic stresses especially iron toxicity, and pest and diseases. Accordingly, Bw 12-574, a rice line belonging to 3 months maturity group was nominated to NCRVT in Yala 2016. Six rice lines of 3½ months maturity duration were selected through PYT in Yala 2016. Ten rice lines of 3 months maturity duration were selected through PYT in Yala 2016.

Seeds of elite rice lines, Bw 12-574, Bw 11-3403 and Bw 03-1198 were multiplied. Seeds of recommended varieties (Bw 351, Bw 400, Bw 451, Bw 452 and Bw 453) and 15 promising rice lines were multiplied.

Thirty six entries of International Rain-fed Lowland Observational Nursery-2016 (IRLON 2016) were evaluated for yield and adaptability to the local environment at RRRDC, Bombuwela. Ten rice lines having suitable characteristics were selected for further evaluation.

Agronomy

A study was conducted to identify suitable Bw rice varieties for three different soil types in LCWZ during three consecutive seasons from Maha 2014/15 and found that Bw 372 and Bw 361 varieties were suitable for half- bog soil type as well as soils with sandy and loam texture. Bw 367 and Bw 267-3 also performed well in half- bog soils and Bw 363 was well suited for sandy and loam textured soils.

Study on alternative fertilizer application methods showed that seedling soaking/ dipping in Phosphorus slurry improved growth and yield of rice in a Phosphorus deficient soil compared to the Phosphorus broadcasting method.

Thirteen promising rice lines and 8 promising rice lines were evaluated under NCRVT program during Maha 2015/16 and Yala 2016 respectively. Rice lines Bg 12-1666, Bg 10-2881, Bw 11-3403, At 13-2715, At 13-1543 and At 13-3791performed well.

Four promising rice lines were evaluated in Maha 2015/16 while 2 rice lines were evaluated in Yala 2016 under VAT program. Rice lines Bg 09- 1857 and Bg 11-802 performed well.

Weed Science

Study conducted to determine the weed competitive ability of some selected Bw rice varieties in LCWZ showed that Bw 372 and Bw 361 were most competitive against weeds among all varieties tested.

Four new herbicides were evaluated along with already recommended herbicides under NCHST program and two new molecules with high efficacy in controlling sedges and broad leaves were identified.

Two recommended herbicides (Azimsulfuron 50%WG and Flucetosulfuron 10%WG) were re-evaluated in Yala 2016 and results showed that both chemicals were still effective in controlling all weeds.

Pathology

Study carried out to estimate the yield loss in rice due to BLB in LCWZ indicated that rice yield loss in Yala was 14%-38% while it was 4%-15% in Maha.

Morphological differences were observed in the isolates collected in LCWZ in a study conducted to investigate the variation of brown spot causing pathogen; *Bipolaris oryzae*.

106 rice breeding lines/varieties developed under rice improvement programs were screened for BLB to identify resistant sources and found that none of the tested rice lines was resistant for the disease.

Twenty eight International Rice Bacterial Blight (IRBB) rice lines were tested for BLB resistance and 11 rice lines were identified as resistant.

Entomology

A study initiated to develop a forecasting model for RSM in 2013 revealed that high temperature (> 30˚C), wind velocity around 3-4 km/h, low relative humidity (<80%) and dry

weather conditions were favourable for increase of RSM population.

In screening of NCRVT rice lines for BPH found that one rice line is resistant and 12 rice lines are moderately resistant.

Forty nine rice lines received through INGER program were screened for BPH and 7 resistant rice lines and 18 moderately resistant rice lines were identified.

In an experiment conducted to determine the status of parasitism of stem borers in the region, a stem boring species that can be suspected as new was observed. Authentic identification of the new species needs to be done.

Soil Science

In a study conducted to determine heavy metal contaminants in rice grains found that Lead (Pb) and Cadmium (Cd) contents present in grains of 5 rice varieties grown at 5 locations were not in detectable levels. However, significantly high amount of Fe and Zn were detected in samples collected from Bombuwela location.

Analysis of grains of 15 traditional rice varieties showed that Fe and Zn in 'Sudu Heenati' and 'Kalu Heenati' were high.

Seven soil maps were prepared showing the spatial variability of Fe, Mn, Cu, Zn, P, K and organic matter in 9 ha of paddy fields in the Centre. It was revealed that dosage of fertilizer could be altered based on Phosphorus and Potassium content in il.

Water Management

Performance of Bw 364 and Bg 359 were evaluated for raised bed sowing used for alleviating iron toxicity and found that Bw 364 gave higher yields.

Seed Production

Following amounts of breeder seeds of recommended rice varieties were produced.

Table 1.4.1.2: Breeder's seeds production

Variety	Quantity (kg)		
	Maha 2015/16	Yala 2016	Total
3½ months			
Bw 364	20.5	20.5	41.5
Bw 361	20.5	-	20.5
Bw 367	246.0	328.0	574.0
Bw 372	102.5	61.5	164.0
3 months			
Bw 272-6b	30.8	20.5	51.3
Total	**420.3**	**430.5**	**850.8**

The following amounts of seed paddy (Foundation, registered, certified and commercial seeds) were produced.

Table 1.4.1.3: Seed paddy production

Variety	Quantity (kg)		
	Maha 2015/16	Yala 2016	Total
4½ months			
Bg 455		348.5	348.5
3½ months			
Bw 367	205.0	2508.5	2713.5
Bw 372	1842.5	1912.0	3754.5
Bw 364	123.0	112.5	235.5
Bw 363	61.0		61.0
Bw 361	41.0	116.0	157.0
Bw 267-3	30.8	110.0	140.8
3 months			
Bw 272-6b	328.8	701.5	1030.3
2½ months			
Bg 250	375.0	651.5	1026.5
Total	**3007.0**	**6460.5**	**9467.5**

Special Projects

Following projects were implemented.

- Investigation of patho-type diversity of Bacterial Leaf Blight pathogen *Xanthomonas oryzae* pv. *oryzae* in Sri Lanka (NARP).
- Role of allelo chemicals in rice (*Oryza sativa*) responsible for reproductive maturity of paddy bug, *Leptocorisa oratorius* (NARP).

Activities relevant to following projects were carried out.

- National Food Production Program
- Development of rice varieties for submergence tolerance and iron toxicity tolerance (NARP)

Technology Dissemination

- During the year, 1316 soil samples, 106 grain samples, 11 compost samples and 36 plant samples were tested for different parameters. Ten water samples were tested for pH.
- Fourteen training programs were conducted on different subjects for extension officers, farmers, teachers, nurses, students in different categories and other interesting groups. The total number of trainees participated was 681.
- Officers participated as resource persons in 7 field days and 7 exhibitions which were organized by various organizations.
- Officers participated as resource persons in 20 programs / workshops organized by various organizations.
- A total of 36 internal seminars were conducted by the officers in the Centre.
- One live radio program on integrated plant nutrient management in rice cultivation was participated.

TRAINING, CONFERENCES & WORKSHOPS ATTENDED

Following trainings, workshops and conferences were attended by the officers.

- 5th International congress of Bacterial Leaf Blight. 16-18 Oct. 2016, Manila, Philippines.
- Workshop on Regional Expert Consultation on Hybrid Rice Development in Asia: Constraints and Opportunities. 1-4 Nov. 2016, Changsha, China.
- Comprehensive Technologies of Hybrid Rice. 5 July – 4 Aug. 2016, Changsha, China.

RICE RESEARCH STATION BENTOTA

Rice Research Station (RRS), Bentota is a substation of RRRDC, Bombuwela. The mandate of the station is to develop the technologies for rice cultivation in the flood prone and saline areas.

PROGRESS

Research

Six different rice varieties were evaluated for germination in water logged condition. Bg 455 and Bg 379-2 were found better for water logged condition.

Among 13 rice varieties evaluated, Bg 357, Bg 358, Bg 359, Bg 366, Bw 267-3, Bw 364 and Bw 367 performed well in half bog soils.

Fungal species isolated from rice rhizosphere were screened for phosphate solubilisation ability and antifungal activity against rice plant pathogens. Two phosphate solubilizing fungal isolates were selected to develop as phosphorus bio fertilizer for rice cultivation. Low cost growth medium was developed for mass multiplication of selected phosphate solubilizing fungal isolates.

Thirteen promising rice lines and 8 promising rice lines were evaluated under NCRVT program during Maha 2015/16 and Yala 2016 respectively. At 13-3791 and Bg 07-997 performed well among the tested rice lines in $3^1/_2$ months and $4^1/_2$ months maturity groups respectively.

Four promising rice lines were evaluated in Maha 2015/16 while 2 rice lines were evaluated in Yala 2016 under VAT program. Bg 09-1851 and Bg 11-802 performed well among the tested rice lines.

Seed Production

Following amounts of commercial seeds were produced during the year.

Table1.4.1.4: Commercial seed paddy production

Variety	Quantity (kg)		
	Maha 2015/16	Yala 2016	Total
Bg 455	899	401	1300
Bw 372	765	48	813
Bw 367	476	168	644
Suwandal		115	115
Madathawalu		191	191
Total	**2140**	**923**	**3063**

Technology Dissemination

- Participated in mobile service day of Galle district – 'Nila mehewara'.
- Two lectures were delivered to officers in Land used unit in Kalutara district and Police training college, Kalutara on 'Sorjan' method.
- Information were given to the farmers who visited the research station.

Trainings, Conferences & Workshops Attended

- International Program on Improved Technologies for Productivity Enhancement of Fruit Crops and Saline Tolerant Paddy. 23–26 March 2016, National Inland Fisheries and Aquaculture Training Institute, Kalawewa.

PLAN FOR 2017

RRRDC, BOMBUWELA

Rice Varietal Improvement

- Development of rice varieties through conventional breeding technique.
- Development of rice varieties for submergence tolerance and iron toxicity tolerance.
- Improvement of Ld 99-12-38 for BLB resistance.
- Improvement of traditional rice varieties / advance breeding rice lines through mutational breeding technique.
- In progression of BLB resistance and shortness into Bw rice varieties.
- Improvement of Bw rice varieties for resistance to BLB.
- Multiplication of 10 traditional rice varieties.

- Breeder seed production.

Agronomy

- Evaluation of rice lines under NCRVT and VAT program.
- Evaluation of seeding rate and seedling age for machine transplanting.
- Evaluation of organic matter to improve rice productivity in mineral and sandy soil types.
- Identification of optimum leaf age for parachute transplanting.

Weed Science

- Evaluation of herbicides under NCHST program.
- Re- evaluation of recommended herbicides.
- Evaluation of weeding methods for machinery transplanting.

Pathology

- Screening of breeding rice lines, NCRVT rice lines and INGER rice lines for rice. blast disease and bacterial blight disease.
- Estimation of yield loss due to bacterial blight disease.
- Identification of pathotype diversity of *Xanthomonas oryzae* pv. oryzae in LCWZ
- Study on seed treatment for controlling brown spot in rice.

Entomology

- Role of allelo chemicals in rice responsible for reproductive maturity of paddy bug *Leptocorisa oratorius* (NARP project).
- Study on natural parasitization of rice stem borers and rice leaf folder at Kalutara District
- Screening of rice lines for BPH and RGM

Soil Fertility Management

- Evaluation of long term application of organic and inorganic fertilizers on rice grown in LCWZ.
- Characterization of spatial variability of selected physical and chemical properties of soils in selected farmer fields in Kalutara District.
- Evaluation of different types of new fertilizers on rice grown in LCWZ.
- Conducting soil test based fertilizer recommendation for rice.

Water Management

- Field evaluation of selected rice varieties for water seeding.
- Determination of spatial variability of pH, EC, Fe, P and K in rice fields in Kalutara District.

RRS, BENTOTA

- Evaluation of $3^1/_2$ month aged different rice varieties for half bog soil.
- Evaluation of different rice varieties for 'Sorjan' bed cultivation.
- Evaluation of rice germplasm for seed germination in water logged condition.
- Evaluation of Zn application methods on rice grain yield and grain Zn content.
- Soil improvement in 'Sorjan' beds.
- Development of Bio fertilizer for rice cultivation.

- Production of commercial seeds of Bg 455, Bw 372 and Bw 367, 'Madathawalu', 'Suwandal' and 'Beheth Heenati'.
- Testing of promising rice lines under NCRVT/VAT program.

STAFF LIST

RRRDC, Bombuwela

Designation	No. Existing
Deputy Director of Agriculture (Research)	01
Assistant Director of Agriculture (Agric. Research)	08
Agriculture Monitoring Officer	02
Program Assistant (Agriculture)	05
Development Assistant	01
Development Officer	01
Agricultural Instructor	08
Research Assistant	14
Public Management Assistant	07
Technological Assistant	01
Farm Clerk	01
Driver	03
Tractor Operator	01
Machine Operator	01
Circuit Bungalow Keeper	01
Watcher	04
Laborer (Permanent)	45
Laborer (Contract)	02
Total	**106**

RRS, Bentota

Designation	No. Existing
Assistant Director of Agriculture (Agric. Research) In-Charge	01
Assistant Director of Agriculture (Research)	01
Development Officer	01
Agricultural Instructor	03
Research Assistant	02
Public Management Assistant	04
Technological Assistant	04
Driver	01
Watcher	02
Laborer (Permanent)	10
Laborer (Contract)	05
Total	**34**

1.5 NATURAL RESOURCES MANAGEMENT CENTER (NRMC) - PERADENIYA

The Natural Resources Management Centre (NRMC) is mandated to optimize the use of land and water resources on scientific basis to improve national agricultural productivity in a sustainable manner. Changes in land use pattern with increasing population pressure diminish both the quality and quantity of land and water resources while climate change and its extreme situations are exerting additional pressure on them. These issues are leading to accelerated soil erosion, declining soil fertility, salinization and retardation of water availability for agriculture and deterioration of soil and water. Therefore, development of technologies targeting judicial utilization while conserving natural resources, particularly land and water resources are a vital task.

The NRMC conduct research and development programs covering several disciplines. Research thrust areas of the Centre are soil conservation and watershed management, land suitability evaluation, agro-meteorology and climate change, geo-informatics and remote sensing, productivity enhancement, soil and water quality assessments and on-farm water management. Main development programs include implementation of the Soil Conservation Act, maintenance of the agro-meteorological observation network of the country, technology dissemination, provision of technical assistance and services in environmental impact assessment of various development projects.

BUDGET

Table 1.5.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	2,760,489	2,597,447	94
Capital	10,400,000	9,722,318	93
Projects			
• Implementation of Soil Conservation Act	5,000,000	4,334,793	87
• NARP	240,000	220000	92
• NFPP	48,000,000	36,800,000	77
• AFACI – ALMSF 1-7	1,000,000	399,388	40
• AFACI – AMIS - 8	1,000,000	46,056	5
Total	**68,400,489**	**54,120,002**	**79**

PROGRESS

RESEARCH

Issuing of long-term climate forecasts at regular intervals

Altogether, twelve weather communiqué were issued at regular intervals in consultation with the Department of Meteorology during the year explaining probable weather conditions on approaching months. These information were disseminated to regional stations and all district level officers of the department and provinces through the departmental communication network to plan the field activities accordingly and aware the farmers.

Enhancement of OFC, Vegetable & Fruit during offseason & non convectional area as an adaptation measure to climate change

Sri Lanka is bestowed with variety of natural resources and one of such blessing is country's agro-ecological diversity. Even though attempts have been made to harness the potential of this diversity for food crop production since ancient times through various means, still there are some regions in the country where adequate attention has not been given to utilize this potential to enhance the agricultural productivity of the country. Meanwhile, time has come again to launch a strong and effective drive to increase the country's food production program to meet the demand of ever increasing population and decreasing land extent available for food production as a result rapid changes of land use pattern in the light of new momentum of the economic growth after 30 years of civil conflicts. In addition, present day's changing and variable climate along with accelerated land degradation is also exerting an additional pressure on the food crop production efforts. Therefore, a study was undertaken to enhance the production of other field crops, vegetables and fruits by identifying non-conventional areas and locations where food crops can be cultivated during off seasons to ensure a continuous production of food crops. The climate, soil and terrain characteristics were taken in to consideration to determine the suitability of an area for respective crops.

From this study 20 locations has been identified for vegetables, 08 locations for fruit crops and 26 locations for other field crops. The sites for vegetables and other field crops are located in Colombo, Gampaha, Kalutara, Ratnapura, Kegalle, Galle, Matara, Hambantota, Badulla, Moneragala, Kandy, NuwaraEliya, Matale, Kurunegala, Puttlam, Anuradhapura, Polonnaruwa, Jaffna, Killinochchi, Mulativu, Mannar, Vauniya, Trincomalee, Batticaloa, Ampara districts while sites for fruit crops during off-season cultivation are located in Badulla, Moneragala, Kalutara and Kegalle districts.

Assessment of Temperature Regime in Agro ecological regions of Sri Lanka

A study was undertaken to assess the temperature regime of all 46 Agro Ecological regions (AERs) using available minimum and maximum temperature data and by means of GIS technique. Daily maximum and minimum temperature data were collected from 38 meteorological observation stations for 30 years from 1986-2015. Subsequently, the highest maximum temperature and the lowest minimum temperature values were obtained for each month. Thirty year averages were computed for resulted maximum temperature and minimum

temperature values for 23 AERs from the available temperature data. In order to obtain temperature values for the rest of the AERs where observations are lacking, a surface interpolation method known as Krigging was selected using Arc-GIS (version 9.2) software. Assigned temperature values for 46 AER will be more useful in agriculture and weather related decision making and research purposes without a wide margin of errors.

Effect of Annual Temperature Variation on Crop Production in Different Agro-ecological Regions of Sri Lanka

Temperature is one of the most important climatic factors that affect on physiology of plants. Temperature related factors such as Cardinal Temperature Points, Growing Degree Days, Diurnal Temperature Range and Pest and Disease outbreaks are very important in finding the potential and limitation of growing crops. Daily maximum and minimum temperature data were collected from 38 meteorological observation stations from 1986-2015. Daily average maximum temperature and daily average minimum temperature values were calculated for thirty year study period. Calculated values were plotted over the days of the year for different AERs. Selecting the principal crops for specific AERs, relationship between cardinal temperature points of the principal crops and variations of temperature is being studied. This study will continue during 2017.

Identification of drought and high temperature prone agricultural areas and characterize spatial and seasonal agro-ecological environments for adaptive measures

Drought is an insidious hazard of nature. It is often referred to as a "creeping phenomenon" and its impacts vary from region to region. Onset and end of drought is difficult to determine. Drought condition can be traced using crop condition assessment based on vegetation indices derived from remote sensing through analysis of satellite data. Main aim is to evaluate drought occurrences using crop condition assessment with time series MODIS free satellite data to assess drought frequency and map drought prone agricultural areas. Preliminary drought maps covering the entire Island have been developed using 2000 – 2015 16-day MODIS imageries. The study was initiated in 2016 and will continue for another 2 years in collaboration with FCRDI, MahaIlluppallama.

Evaluation and monitoring of Food Production National Program through GIS approaches at GN division level

Food Production National Program is a national wide program launched by the Ministry of Agriculture and coordinated by the Presidential Secretariat, targeting at saving foreign exchange through minimization of the importation of food crops that can be cultivated within Sri Lanka. Program targets for each crop per each GN division are set and spatial distribution of targets and their respective progress in each season is expected to be mapped out. Mapping of food production targets on arable land categories at GN division

level has been completed for Badulla, Hambanthota, Kegalle, Nuwara Eliya and Polonnaruwa districts. The program is continuing.

Identification of suitable paddy lands within major irrigation schemes for crop diversification with OFC

Increasing water productivity of cultivable lands under major irrigation schemes is an urgent necessity. Low productivity of water is attributed to so many reasons, ranging from system level water management to on farm level. A study was initiated to find ways and means to minimize water losses at on-farm level through crop diversification with OFC. Thus, it is attempted to map suitable lands for crop diversification, based on land suitability, particularly the drainage characteristics. The study is being carried out in major irrigation schemes located in Polonnaruwa District and it is collaboration with the Department of Irrigation. Collection of available information and development of base maps to facilitate field survey has been completed. The research is expected to be completed in 2018.

Optimization of land and water productivity of tank cascade systems in Vavuniya District

The cascade system of interconnected small irrigation tanks influence the surface and subsurface hydrology in Dry Zone landscapes. In addition livelihoods of Dry Zone farmers are closely linked with the village tank cascade systems. Hence, improvements to the village tank cascade systems will provide an opportunity for enhancing the livelihood of villagers while contributing positively to the national food production. Holistic and systematic evaluation of village tank cascade systems in the Northern Dry Zone would provide a clear perspective and vision aids for effective management of water resources rather than concerning the tanks in isolation. As a pilot study, a comprehensive evaluation of spatial distribution of village tank cascade systems within Vavuniya District was carried out using remote sensing approaches, combined with other available maps and field level investigations. Initially, Kovilkulam Agrarian Service Centre has been studied in detail and planning to extend the evaluation in to other areas as well. The study will be completed by 2018 and its a collaboration with Vavuniya Campus and the Department of Agrarian Development.

Assessment, characterize and mapping of soil erosion hazards in Dry Zone

Soil erosion hazard is the susceptibility of a particular land to soil erosion under a given land use system. Even though the soil erosion hazard assessments have been done for the Wet Zone, no attempt has been taken to assess the spatial distribution of soil erosion hazard due to rainfall, in the Dry Zone of Sri Lanka. Although the Dry Zone landscape is gentle with mild slopes, most of the area is covered with Reddish Brown Soils which is highly erodible. Moreover, preliminarily observations show that the rains within the zone are more intense and erosive. Therefore, it is vital to assess the spatial distribution of soil erosion hazard in the Dry Zone of Sri Lanka, thus prioritization of conservation efforts can be made. A study was initiated to evaluate the present soil erosion status and map the spatial distribution of soil erosion hazard within the

Dry Zone of Sri Lanka using GIS and remote sensing approaches. Required inputs such as soil erodibility (K) using soil map and erodibility values already published in literature; Slope (SL) factor using ASTER GDEM (30m) satellite elevation data acquired from NASA web site; Management Factor (P) using 1:50000 digital land-use map; Vegetation cover (C) Factor using Land Sat (30m) 2015 satellite data by deriving NDVI and C factor modeling were developed. Further analysis and field validation of tentative outputs need to be carried out. The study will be continued during 2017.

Soil Erosion hazard mapping for Sabaragamuwa Province and its use for conservation and land use planning

Implementation of soil conservation activities in farmer's fields within the Central Highlands is a major program conducted by the NRMC in collaboration with Central, Uva and Sabaragamuwa Provincial Departments of Agriculture. The conservation efforts are being prioritized within the above Provinces based on Soil Erosion Hazard Assessments conducted by the NRMC. Although detailed maps indicating soil erosion hazard are available for the Central and Uva Provinces, such maps are not available for the Sabaragamuwa Province. Hence, the objective of this study is to map the soil erosion hazard within the Sabaragamuwa Province and utilize the same for prioritization of soil conservation efforts and to identify areas where land use changes are required as a measure of soil conservation. Geo-spatial technology is used for the assessment and mapping of soil erosion hazard. A tentative soil erosion hazard map for the Province was prepared and its accuracy assessment and field validation is yet to be done using field observations, questionnaire surveys and through farmer interviews. Intermediate results shows that 61% of land area is under extremely high and very high soil erosion category. Therefore, soil conservation programs and land use changes in high erosion prone areas must be implemented to minimize the risk of erosion and relevant stakeholder government agencies can make use of above maps for their land use planning purposes. The final version of the soil erosion hazard map pertaining to Sabaragamuwa Province will be published in mid 2017.

Assessment of Catchment Scale soil erosion using Nuclear Techniques

The lack of information on soil erosion status in agro-ecological regions under different land uses is one of the major drawbacks in successful implementation of soil conservation programs. Current recommendations and specifications of soil conservation measures need to be revisited under the present context of changing climate, and these specifications need to be revised. Assessment of soil erosion in selected watersheds of Rathnapura and Matale districts were carried out to identify the land uses that are more responsible for soil erosion using radio isotopes of ^{137}Cs and ^{210}Pb. Out of four land uses selected (Tea, Rubber, Natural forest and Lowland paddy) in Ratnapura district tea recorded the highest soil erosion (11.8 t/ha/yr) followed by rubber (4.13 t/ha/yr). Natural forest (0.5 t/ha/yr) and lowland paddy (5.5 t/ha/yr) recorded a soil deposition rather than erosion. Data analysis of soil erosion under different land uses (Shifting vegetable cultivation, Low land paddy, Pepper

Spice gardens, Coconut plantation and Natural forest) in Matale district is in progress.

Web GIS Portal for Agricultural information Dissemination

Geographic Information System helps in effective analysis and management of spatial data. The development of a Web-based system by integrating GIS and Database Management System (DBMS) allow the user to operate the system without having to understand the underlying intricacies of GIS and DBMS technologies. Moreover, it would allow sharing of spatial information and technical expertise among variety of users. The objective of this project is to develop web-based interactive information and mapping portal for exploring data, information and maps related to Agriculture. Open source GIS software will be used to generate this web portal. As a trial, web GIS platform was created from Arc GIS account and platform linked to agriculture department website. (www.agridept.gov.lk /crop suitability/ webGIS platform). The expected outputs are agriculture related spatial data access and dissemination, spatial data exploration, geo visualization and spatial data processing, analysis and modeling. This project will continue in 2017.

Identification of rainfall intensity anomalies to revitalize the erosivity map of Sri Lanka

Climate change is a global phenomenon and Sri Lanka is also facing its repercussions. In Sri Lankan context climate change is evident mainly as changes in rainfall pattern; basically the extreme events of rainfall are on the increase while annual totals are remaining more or less unchanged. Under the above scenario, one can expect higher rainfall intensities compared to the past decades. These high intensity rain carries higher energy, thus can enhance soil erosion. It must be noted that, no attempt has taken to update and improve the rainfall erosivity map of Sri Lanka after the year 1986. Thus a study was initiated with the objective of studying the trend of rainfall intensities under the present context of climate change, and it is expected to depict the rainfall intensity and its energy at a national scale map, so that one can use such information for soil erosion hazard assessments, to assess the impacts of climate change on soil erosion and for planning & designing of storm water disposal systems etc. Availability of rainfall intensity data are meager, hence attempts are being made to improve the field data collection process. This study will be continued for the next three years (2017 - 2019) in order to fulfill the base data requirement.

Establishment of soil conservation technology demonstration home gardens

Under the Biodiversity for Adaptation to Climate Change (BACC) project, three home garden technology demonstrations were established in the Gampola and Kalugala areas. Technologies namely soil bund, Gliricidia hedge rows, lock and spill drains, individual platforms, terraces, contour planting, water percolation pits were demonstrated. Six farmer trainings were conducted using above demonstrations in the year 2016. Based on training outputs, follow up home garden development programs will be implemented in Kalugala, Koslanda, Padupola, Udukumbora, Gampola and Pahala Giribawa villages in 2017.

Monitoring water quality of major streams in central highlands in Sri Lanka to identify critical watersheds for conservation

Monthly water samples were collected from 11 locations in the Mahaweli River and 16 tributaries of the same since 2014 September. The samples were analyzed for turbidity which is a measurement of suspended solids. The suspended solids mostly contain fine soil particle of eroded soils. Results showed that sediment load coming from urban areas is greater than agricultural areas during most of the months in the year with few exceptions. The exceptional months were November and December. The reason for higher sediment load coming from tributaries could be due to land preparation activities in farming lands during said months. Furthermore, among tributaries studied, the sediment discharge from the Badulu oya, Uma Oya and Belihul Oya were significantly higher than that of other tributaries. It could be due to year round vegetable cultivation that are being practiced by vegetable farmers and tea growers in said watersheds. Hence, above streams can be identified as critical watersheds with respect to soil erosion in the Central highlands. Data collection is continued as a long term activity.

Mapping of soil salinity in coastal uplands for development of suitable crop management strategies

Studying soil salinity status in upland soils was initiated in Puttalam District which was considered as the pilot area. During the year 2016, the survey was completed. Data on soil fertility status of normal and salt affected soils were collected and it was revealed that around 15 % the extents of uplands in the Puttalam District is salt affected. It is expected to recommend land and crop management strategies for such lands in order to improve their productivity.

Agricultural land management for improving irrigation efficiency and soil fertility in agro-well based small holder farms in Sri Lanka

Agro-well based small holder farms in dry zone of Sri Lanka are far below their attainable optimum of land and water productivities. Agricultural land management for improving irrigation efficiency and soil fertility will have a positive impact to bring this farming sector back to optimum productive levels. This project was funded by AFACI (Asian Food and Agriculture Corporation Initiative) PAN ASIAN Project in Republic of Korea and objective of this study was to provide guidelines for improving irrigation efficiency and soil fertility through agricultural land management. Methodology includes several steps namely, baseline survey on present status of the drawback, soil survey to identify yield limiting soil factors, organizing on-farm demonstrations for promotion of micro irrigation systems, organizing on-farm demonstrations for promotion of organic manure use (compost making) and popularization of soil test based fertilizer use in agro-well farming sector in Sri Lanka.

Introduction of micro irrigation technologies for crop irrigation, soil test based chemical fertilizer use and compost application were identified as the most effective technologies for improving soil fertility and increasing irrigation efficiency of agro-well farming systems in the Dry and Intermediate Zones. A methodology was developed for promotion of micro

irrigation technologies aiming at small holder agro-well farms. The project will continue during 2017.

Development of multifunctional soil conservation bunds for mechanized rain-fed uplands in the Dry Zone of Sri Lanka

Upland farmers in the Dry Zone are reluctant to establish closer interval soil conservation bunds in their lands, simply because such earth bunds make the use of machinery for land preparation activities such as ploughing is difficult. Hence, instead of closer interval earth bunds, feasibility of widely spaced and broad based bunds were explored prior to test the approach in farmers fields. In order to make use of the land space under the earth bund, it was explored the possibilities of establishment of perennial tree hedgerows on the upstream side of the bund. Therefore, the main aim of this project was to replace presently recommended close interval soil bunds with widely spaced and broad based bunds plus tree hedgerows for rain-fed uplands in the dry zone. Methodology includes comparison of different tree hedgerows on widely spaced broad base soil bunds. Hedgerow combinations are considered as treatments. The treatments are; Control (No tree hedgerow), 'Miti murunga', 'Kathuru murunga', Cinnamon, Pomegranate, 'Thibbatu', Citronella and 'Sera'. Income from hedgerow component will be used to compare the treatments. The other steps include investigation of the possibility of inclusion of dwarf plant types (Pomegranate, Oranges and Lime) into bund system. On-farm adoption of promising treatments (Tall hedge plant types and dwarf plant types) and obtaining farmer perspectives and demonstration of promising bund systems on farmer fields are yet to be done. 'Miti murunga', 'Kathuru murunga' were identified as promising hedgerow plants and application of this technology in farmer fields will be carried out using above promising plants. Further investigations will be done during 2017.

Investigation on the effect of drinking water quality on the occurrence of CKDu in Dry Zone settlements

The Chronic Kidney Disease of unknown aetiology (CKDu) has been a major health issue in dry zone settlements and the causal factor and preventive measures have not been clearly identified yet. One possible factor is the adverse effect of drinking water. Objective was to investigate the effect of selected chemical parameters of drinking water on the occurrence of CKDu. Monthly water samples were collected from drinking water wells and adjacent streams (Natural streams and man-made canals) from CKDu recorded areas in Girandurukotte and non-recorded areas in the Hasalaka-Hettipola tract. The water samples were analysed for pH, EC, Na, K, Ca, Mg, Cl and F. Standard methods were employed in chemical analysis. Research conducted at the Girandurukotte area by Department of Agriculture in collaboration with Rajarata University of Sri Lanka revealed that ground water in CKDu recorded areas shows significantly higher concentrations of Na^{+}, F^{-} and Cl^{-} and significantly lower concentrations of Ca^{++} and Mg^{++}. Further, it showed the superiority of surface water (tank and river water) over ground water for drinking purpose. Hence, till such time the causal factor is found, it is recommended to use purified good quality

surface water for drinking purposes. The study will continue for 2017.

Assessment of ecosystem services in major agricultural land uses in selected agricultural systems

A survey was conducted in the cascade systems in the Giribawa area, Kandyan forest gardens in the Kalugala area and 'Ovita' land system in the Milleniya areas in the country to assess the ecosystem services of such agricultural land use systems. Results showed that those land use systems are capable of providing multifunctional services. The major services identified under provisioning category were food for domestic use, water for domestic needs, timber for market, firewood for domestic cooking purpose, flowers for village religious activities, treacle mainly for market, medicine for village needs and space for living. Major types of subservices vary with the type of home garden system. Provisioning type of services appeared in farmlands include condiments, spices, fruits, firewood for domestic needs, medicine for village needs and space for living in the Kalugala area. Such services appeared in Giribawa area included vegetables, fruits, timber, firewood, flowers, medicine and space for living. In Milleniya area, such services were fruits, coconut, timber, flowers, medicine and space for living. The study suggested the need of enhancing the capacity of beneficial ecosystem services for improving land productivity.

Investigation on land fragmentation effects on the loss of bio diversity in Kandyan forest garden system

A field survey was conducted during 2015 in Kandy district using 30 non fragmented Kandyan forest gardens in rural areas in 21 villages namely; Mullegama, Batugoda, Batagalla, Palipana, Idamegama, Dunuwila, Rathugohodiwela, Kurundeniya, Katakumbura, Wegirikanda, Wegiriya, Hondiyadeniya, Handessa, Davulagala, Maddegoda, Kurundugahamada, Kalugamuwa, Yatihalagala, Yatiwawala, Uduwawala, Medawala and 30 fragmented Kandyan forest gardens in urban areas in 3 villages namely Embilmeegama, Gangoda and Nerathaldeniya. Results showed that 70 tree crop species occur in Kandyan forest gardens as 32 fruits, 18 other edible crops species and 20 timber species. The occurrence of most of permanent crops in Kandyan forest gardens has been reduced due to land fragmentation. The reduction was from 82 to 47 in Avocado, 86 to 66 in Banana, 64 to 12 in Durian, 43 to 39 in Papaya, 96 to 41 in Jackfruit, 96 to 31 in Clove, 79 to 42 in Pepper, 71 to 46 in Coffee and 89 to 35 in Nutmeg. In contrast, it was from 57 to 62 in Guava showing an increase in Guava.

The study necessitates the urgent need of reviewing the policies related to land fragmentation in urban and sub-urban areas in order to retard the rate of disappearances of important fruits, spices, and other economically important species. On the other hand, in order to compensate the loss of occurrences of species and their production, commercial cultivation ventures should be explored. Moreover, it emphasizes the need of introduction of dwarf type of varieties in order to maintain the plant density in Kandyan forest gardens.

Harnessing the potential of rain water harvesting and agro-well system to improve the land productivity under water limited situations

The main objective of this study was to identify present status of irrigation methods utilized in agro-well system and find out reasons for not adopting sprinkler irrigation methods in rain-fed upland cultivation under agro well farming systems in Anuradhapura district. For this purpose, a structured questionnaire based survey was conducted in four Assistant Agricultural Director regions namely, Thirappane, Ipologama, Anuradhapura and Kahatagasdiliya in the Anuradhapura district during April to August 2016. Results of the study revealed that most of the farmers (77%) practiced filling basin by pipes while 17% farmers practiced sprinkler irrigation and only 1% practiced both drip irrigation and trickle irrigation. The most common reason for not practicing sprinkler irrigation is financial difficulties while inadequate transmission of technical knowhow also affects the adoption of micro irrigation. After completion of the survey, hundred farmers were selected to distribute sprinkler irrigation systems for a quarter acres of land under the basis of 50 % contribution of the government and the other 50% by the farmer. However, only 63 farmers have deposited their shares to reserve their systems. Therefore, it is understood that even though the farmers are well aware of the importance of installing micro irrigation systems, they are unable to afford it, even though the government bare the fifty percent of the expenditure. However, there is a tendency in adopting sprinkler irrigation systems with the increase of the extent of land holdings. Moreover the study reveals that reasons such as insufficient technical knowhow, financial problems and the complexity of system are the main reasons for poor adaptation. Therefore the study recommends following initiatives such as strengthening extension programs and conducting practical training for assembling sprinkler irrigation systems, financial supports such as 50% subsidy to bear the cost of necessary appliances and introduction of low-cost irrigation systems instead of more sophisticated systems, in order to improve the adaptability.

Water balance studies in Dry Zone micro-watersheds to develop ground water availability regions

Rainfall in the Dry Zone is erratic and mostly confined to two seasons. The irregular rainfall distribution and acute water shortage during dry period, particularly from June to September have been a major constraint for agricultural development in this region. In this context, groundwater has been evolved as a supplementary source of water for agriculture in the Dry Zone of Sri Lanka. It appears that the current demand for ground water is more than the available supply. Over exploitation of ground water can lead to disastrous consequences. Therefore, much attention with precautionary guidelines are essential for ground water extraction and utilization. This study aims at identifying a groundwater tapping index per micro- watershed in Dry Zone. For this purpose, a water balance was initiated in Wellamudawa micro-catchment in Thirappane Divisional Secretariat in Anuradhapura district, during Maha 2016/2017 to Yala. The rainfall is measured daily using a rain gauge installed in the catchment area while

evaporation is also measured using a evaporation pan installed in same location. Surface runoff was measured by water collected in the tank using a depth gauge and an area capacity curve developed for the relevant tank. The water stored in the soil was measured by monitoring moister content in surface soil (0 - 90cm) by weight basis. Ground water level was measured by resistivity meter. Both measurements were taken in weekly interval. The setting up of the instruments for data collection was completed and collection of data is in progress. This is a long term study and will be continued until 2018/19 Maha.

Implementation of Soil Conservation Act (SC Act)

Responsibility of the implementation of Soil Conservation Act is vested upon the Centre on behalf of the Director General. Activities under the Soil Conservation Act were accelerated significantly during the recent past as a result of the allocation of relatively sufficient funds compared to some years back. Therefore, it was possible to establish a practical implementation setup with other agencies such as Provincial Departments of Agriculture, Plantation Sector Institutes etc. Activities are implemented broadly under two categories; a) Legal aspects & their improvements and b) Technology Transfer & awareness creation.

Legal aspects & their improvements

The existing provisions of the Soil Conservation Act No. 25 (1951) & Amended No. 24 (1996) are not at all sufficient to address the present problems of soil erosion and land degradation in the country. Therefore, legal coverage which covers a broader spectrum of land degradation prevention process is a timely need. Therefore, the Centre has already submitted a draft new act, namely Soil Conservation and Land Degradation Prevention Act to the Ministry of Agriculture and they are in the process of submitting the new proposal for the Cabinet.

Technology Transfer and awareness creation

Field level implementation of soil conservation is a devolved subject under the Constitution of Sri Lanka. Therefore, technology transfer and awareness creation on soil conservation related matters were implemented through the Provincial Departments of Agriculture (PDA).The Centre paid attention to develop human and other infrastructural resources of PDAs particularly in Central, Uva and Sabaragumuwa during the year.

During the year Central, Sabaragamuwa and Uva Provincial Departments of Agriculture were allocated approximately 3.5, 2 and 2 Mn rupees for implementation of soil conservation activities. Appropriate soil conservation measures/ structures were established in micro water-shed based farmer fields. Within the conservation area it has promoted to conserve micro catchments rather than establishing individual demonstrations. Ruwanpura, Paranadombawela, Medamahanuwara, Maspanna, Beragala, Balangoda and Galigamuwa were conserved under this program. It was covered 130 acres farmer fields in all seven districts. In addition to the conserved micro watersheds 12 individual demonstrations were established in the Sabaragamuwa Province. Though the unexpected weather condition caused drawback of soil conservation activities during the year, it could be achieved more than 85% physical progress. Overall financial progress achieved

was 87% against to the total allocated funds for implementation of Soil Conservation Act.

Maize cultivating lands in Dry Zone (Anuradhapura, Polonnaruwa & Monaragala IP) were successfully conserved by establishing soil bunds.172 acres were conserved in this year as a pilot project under the National Food Production Program.

SC implementation in DOA owned seed production farms

Soil conservation planning and implementation in DOA owned seed production farms, research farms and ISTI were successfully done in this year. It was allocated 3Mn rupees to conserve government seed farms. Sita Eliya, Meepilimana and Kundasale seed farms were conserved under this program and achieve 100% physical as well as financial progress.

TV advertisement on Soil Conservation Act

Island wide awareness campaign was done through mass media (TV Advertisement) on soil conservation act & it was broadcasted in two television channels (Rupavahini & Derana) during the month of November & December, 2016.

Roadside Boards

Roadside boards depicting the importance of Soil Conservation and its legal provisions appear to be an effective mode to disseminate knowledge to the general public. Therefore, 5 roadside boards (Toppass, Ella, Dunhinda, Rosalla & Ulapane) were renewed with newly design sticker which was having a meaningful design on soil conservation.

TECHNOLOGY DISSEMINATION

Training on soil and water conservation, Land development and related subject areas

Training programs

- Three of two-day programs were conducted for the officers of the Uva province, Rathnapura district, and Kegalle districts at In service Training Institute, Bindunuwewa, District Training Center, Rajawaka, and District Training Center, Wagolla. Altogether 119 officers were trained on soil conservation and land development and Soil Conservation Act.
- A training program was conducted in collaboration with Department of Meteorology for 50 agro-meteorological data observers of the Agro-met Stations come under the purview of the Department of Agriculture.
- Forty five number of the military officers were trained on Soil conservation, land development and soil conservation Act at SANASA farm, Ukuwela (2 day program).
- Two programs on “Soil conservation and land development” was conducted for students of National Vocational Training of the DTC Nawayalathenna and DTC Nalanda. Participation – A 2 day programs for 50 students.
- A one 2 day program was conducted for Agriculture Instructors and Technical Assistants at Government seed farm Polonnaruwa. 18 officers participated.
- Forty five officers of the Hadabima Authority were trained for 2 days on soil conservation and land development and

soil conservation act at Agrarian research and development center at Pilimathalawa.

- Fifty agricultural school students were trained on soil sampling, labeling and soil analysis.
- Three programs on soil conservation and Soil Conservation Act awareness were conducted for the officers of the tea estates of Punagala estate, Haputale estate, and Ukuwela estate. All together 125 participated.
- A awareness training on soil conservation and soil conservation act was conducted for officers of the agriculture committee at divisional secretariat office Yatiyantota. 92 participated.
- A training was conducted at the soil conservation demonstration site, Gannoruwa for 42 university students from University of Peradeniya.
- Five one day field trainings on soil conservation and watershed management were conducted for field officers and selected farmers at Doragala and Maspenna watershed under watershed conservation program. All together 161 participated.
- Three programs on soil conservation and soil conservation act were conducted for teachers of Kuliyapitiya education region, Giriulla education region and Kurunegala education region at the Kuliyapitiya teacher training center, Giriulla regional education office, Kurunegala education office, and Ibbagamuwa regional education office respectively. All together 161 teachers were trained.
- Eight one day programs were conducted for training advanced level students on soil and water conservation, soil conservation act and other relevant subject areas of the advanced level syllabus. Trainings were conducted suitable middle schools namely Vidyartha Vidyalaya - Kandy, Wickramabahu Vidyalaya - Gampola, Sirimao Bandaranayake Vidyalaya - Matale, Isuru pasala - Ragala, Pushpadhana Vidyalaya - Kandy, Nugawela Madya Maha Vidyalaya, Poramadulla National School, Rathnayake Madya Maha Vidyalaya - Walala. All together 60 schools were participated and 1105 students were trained.
- Four No. of programs were conducted for the officers and the selected farmers at Tholangamuwa, Meda Mahanuwara, Hatton and Badulla, Altogether 91 participants were trained on soil conservation and Soil Conservation Act and demonstration site development.
- An awareness program on soil conservation and Soil Conservation Act was conducted for Development officers and field officers at Divisional secretariat office, Gangawatakorale, Kandy. 62 officers were participated.
- One training program was conducted for general public at Fruit Research and Development Institute, Horana on soil conservation and land development techniques. 53 participated.
- An awareness training on soil and water conservation was conducted for Mahaweli officers at Kalawewa. 38 participated.
- Officers and residents of the Sisila regeneration hospital, Deltota were trained of soil and water conservation and how to develop their land. 36 participated.
- Two half day awareness lecturers and trainings were conducted on soil conservation and land development for

Southern Province land management officers at the ISTI, Gannoruwa. 80 officers were participated.

- A half day awareness lecture and field training was conducted on soil conservation and land development for vegetable farming for Agriculture Instructors at the ISTI, Gannoruwa. 34 participated.
- One day training on importance of soil conservation for climate smart village was conducted for villages at Kandaketiya under climate smart village program.
- Three awareness lectures on soil conservation and Soil Conservation Act were conducted at the field day programs of Balangoda, Yatiyantota and Galigamuwa. All together 172 villages participated.
- A one day field program was conducted for training the Maize growing farmers to apply soil and water conservation techniques in Ampara.

Workshops

- World water day workshop was held on the theme of "Water and sustainable development" at ISTI, Gannoruwa. One hundred and forty five (145) persons were participated including officers of DOA, Provincial Agricultural Departments and teachers of the Central Province.

Exhibitions

NRMC Officers were engaged in technology dissemination activities at the following exhibitions.

- Education and technical exhibition, Teacher Training Center, Gurudeniya.
- Education exhibition, Alawathugoda National School, Alawathugoda.
- Education and technical exhibition, Nugawela Central Collage, Nugawela.
- Soil and water conservation exhibition, Faculty of Agriculture, University of Peradeniya.

Printed Materials

Following printed materials were prepared and produced.

- Soil conservation awareness posters.
- Sinhala (1000 x10)
- Soil conservation Act awareness leaflets Sinhala (5,000)

Radio Programs

Three Radio programs were aired in integrated service with 'Kandurata Seveya' on Soil and water conservation, Soil Conservation Act implementation were discussed. Programs are namely 'Mahagedarin Govigedarata', 'Asvenna' and 'Krushi Charika'.

Technical Assistance

One of the main activities of the center is provide technical assistance and expertise knowledge on different development activities. Following technical assistances were provided during the year, 2016.

- Technical assistance for establishment of soil and water conservation measures for conserving Ragala estate vegetable growing lands.
- Technical assistance for conserving the soil cut sites at Rambukkana and land blocking site at Mawanella.

- Technical assistance for soil conservation and storm water management for the lands at Hindagala and Doluwa.
- Technical assistance for solve the watershed degradation problem at Ragala.
- Technical assistance for conserve land systems at Kandekumbura, Kumburegama.
- Technical assistance for solving storm water management problems of three lands at Thalatuoya.
- Preparation of soil and water conservation plan and technical support to establishment of soil and water conservation measures at Agriculture School Farm, Kundasale.
- Technical guidance to establishment of soil and water conservation measures at Doragala watershed.

Representation in Technical Committees

- Served as a Member of the National Expert Committee on Climate Change Adaptation. Ministry of Environment, Sri Lanka
- Served as a Technical Advisor to the project on Community Based Adaptation to Climate Change in Sri Lanka. United Nations Development Program (UNDP), Sri Lanka
- Served as a Governing Board Member, SAARC Agriculture Centre, Dhaka, Bangladesh
- Served in National Steering Committee on Climate Change Adaptation
- Served in National Steering Committee on Climate Change and Natural Disasters, National Science Foundation
- Served in National Committee on Natural Resources Management, Sri Lanka Council for Agriculture Research Policies (SLCARP)
- Prepared Soil Conservation and Storm Water Management Plans for Environmental Clearance for various National and Regional development Projects; ie. Land Blocking out& Hotel projects (65), Metal quarries (138), Mini Hydro power Projects (40) and Tree felling Project (84).
- EIA Technical Evaluation Committee of Uma Oya Multipurpose Development project.
- EIA Committee for Technical Evaluation of Morana Reservoir Project in Badulla District.
- EIA Technical Evaluation of Yan Oya Reservoir Project.
- EIA Technical Evaluation of Moragahakanda project.
- EIA Technical Evaluation of Bibila Sugar Cultivation Project.
- Committee on Land Use Planning by LUPPD.

Maintenance of the national agro-met observation network and its database

Agro meteorological observation network of the Department of Agriculture consists of 30 agro-meteorological observation stations along with 90 rain gauging stations. Necessary arrangements were taken to establish new meteorological stations and appropriate actions were taken to improve data collection procedure. The database was updated by computerizing quality assured data. Meteorological data were issued for various departments, institutes, co-operate sector and individuals on demand.

PLAN FOR 2017

Research

- Assessment of micro watershed based soil erosion and sedimentation in different land uses (OFC/ Vegetables/ Potato).
- Monitoring stream water quality and identification of critical watersheds for conservation.
- Assessment of soil erosion hazards within declared conservation areas.
- Assessment of soil erosion hazards in Dry Zone.
- Revision of soil conservation guidelines as an adaptation to climate change.
- Updating of erosivity map of Sri Lanka in response to climate change.
- Harnessing the potentials of rain water harvesting to improve the land productivity under water limited situations.
- Water balance studies in Dry Zone micro watersheds to develop ground water availability regions.
- Identification of suitable paddy lands within major irrigation schemes for seasonal crop diversification.
- Optimization of land and water productivity of tank cascade systems in Dry Zone.
- Evaluation and monitoring Food Production National Program through GIS approaches at GN division level.
- Optimization of land and water productivity of tank cascade systems in Vavuniya District.
- Analytical capacity development for sustainable land management strategies.
- Crop suitability assessments and recommendations as a measure of adaptation for climate change.
- Development of climate smart villages as an adaptation technique for climate change.
- Weather forecasting at Agro-climatological Zone base in collaboration with Department of Meteorology.
- Agro-ecological region based crop recommendations for better agricultural production.
- Development of weather based alert system as a decision making tool for crop management.
- Enhancement of OFC, Vegetables & Fruits during offseason & non convectional area as an adaptation measure to climate change.
- Effect of annual temperature variation on crop production in different Agro-ecological regions of Sri Lanka.
- Impact of *El Nino* effect on the four Rainfall seasons of Sri Lanka.
- Continue drought prone region mapping and characterizing Agro-ecological environment within each Zone for formulation of productivity enhancement recommendations for drought prone Zones.

STAFF LIST

Designation	No. Approved	No. Existing
Director	01	01
Additional Director	01	01
Principal Scientist	03	0

Designation	No. Approved	No. Existing
Deputy Director	06	05
Assistant Director of Agriculture (Agric. Research)	25	03
Assistant Director of Agriculture (Agric. Development)	05	02
Administrative Officer	01	01
Program Assistant (Agriculture)	04	02
Development Officer	06	05
Soil Surveyor	05	04
Agricultural Instructor	07	13
Research Assistant	07	02
Public Management Assistant	07	04
Technological Assistant	01	01
Driver	06	06
Research Sub Assistant	02	02
Office Employee	01	01
Watcher	02	02
Laborer	09	08
Laborer (Contract)	05	03
Total	**104**	**66**

2.1. SEED CERTIFICATION AND PLANT PROTECTION CENTRE (SCPPC) – GANNORUWA

The mandatory tasks of Seed Certification & Plant Protection Centre (SCPPC) comprises the protection of agriculture sector in the country by preventing entry of alien pests; promoting environmentally friendly, technically feasible and economically viable pest management strategies; ensuring appropriate quality pesticides for pest control; assuring safe use of pesticides; promoting seed industry to assure the availability of quality seeds; conserving of genetic resources of food crops and supporting their utilization.

The above functions are performed by five main units of SCPPC, namely: National Plant Quarantine Service (NPQS), Plant Protection Service (PPS), Office of the Registrar of Pesticides (ROP), Seed Certification Service (SCS) and Plant Genetic Resources Centre (PGRC). The SCPPC has regulatory functions pertaining to the following acts.

Plant Protection Act No. 35 of 1999 to protect the local agriculture and promote effective pest management strategies with the least harm to the environment.

Control of Pesticides Act No. 33 of 1980 to ensure availability of high quality pesticides with the least hazard to human health and environment.

Seed Act No. 22 of 2003 to safeguard the farmers as well as the seed handlers from malpractices that would harm the seed industry.

BUDGET

Allocations received and expenditure incurred by SCPPC under recurrent and capital votes are as follows.

Table 2.1.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	53,368,832	51,267,609	96
Capital	39,858,615	33,544,929	84
Total	**93,227,447**	**84,812,538**	**91**

PROGRESS

REGULATORY ACTIVITIES

New Regulations of Plant Protection Act No. 35 of 1999

Comments on Draft Regulations of Plant Protection Act No. 35 of 1999 were received from Department of the Legal Draftsman. Up on the receipts of comments and suggestions, two workshops and several meetings were held to discuss and finalize the regulations. Subsequently, comments and suggestions agreed in workshops and meetings were incorporated into the draft regulations. The draft regulations and schedules were completed in Sinhala, Tamil and English languages and

submitted to the Legal Draftsman Department through Ministry of Agriculture.

Draft Regulations of Seed Act No. 22 of 2003

Five workshops were held to prepare the draft regulations of Seed Act No. 22 of 2003. Preparation of the regulations in Sinhala, Tamil and English languages was completed and the draft was submitted to the Legal Draftsman Department for comments.

Online Database on Importation of Vegetable and Fruit Seeds

Preparation of a national level database on vegetable and fruit seed imports "Seed MIS" (Seed management Information System) was completed. This task was coordinated by Seed Certification and Plant Protection Centre (SCPPC) together with Seed and Planting Material Development Centre (SPMDC) and National Agriculture Information Communication Centre (NAICC). "Seed MIS" was launched by the Hon. Minister of Agriculture and Director General of Agriculture on 14th October 2016.

The database is useful for easy retrieval of vital information relevant to issued import permits and the details of actual quantities of seeds that were imported through Seaports and Airports.

Data entry is entrusted with NPQS and SCS. The database is ready to use after initiation of infrastructure facilities at NPQS and entry ports.

Three thousand nine hundred and one (3901) Import permits have been issued during 2016 by the National Plant Quarantine Service (NPQS). The following tables indicate the quantities of vegetable and fruit seeds imported during 2016.

Table 2.1.2: Total quantity of vegetable seeds imported via Sea Port and Air Port during 2016

Crop	Quantity (kg)			Crop	Quantity (kg)		
	Sea Port	Air Port	Total		Sea Port	Air Port	Total
Bean	128,490	0.57	**128,491**	Luffa	5,240.46	200.25	**5,441**
Bitter gourd	3,228.5	657.36	**3,886**	Okra	5,905	12,413.7	**18,318**
Broccoli	37	-	**37**	Packchoi	13.6	-	**13.6**
Cabbage	973	1,089.79	**2,063**	Pepper/ Sweet pepper/ Bell pepper etc.	654.28	390.08	**1,044**
Carrot	46,223.5	42.02	**46,266**				
Cauliflower	20	52	**72**	Hot pepper/ Chilli	4,555.8	586.4	**5,142**
Chinese cabbage	25	10	**35**	Pumpkin	11,002.7	830.1	**11,833**
Chinese kale	160	-	**160**	Big onion	19,500	3,250	**22,750**

Crop	Quantity (kg)			Crop	Quantity (kg)		
	Sea Port	Air Port	Total		Sea Port	Air Port	Total
Lettuce	500	-	**500**	Drumstick	49	2	**51**
Cucumber	3,153.95	430.02	**3,584**	Radish	11,592.5	120.04	**11,712**
Eggplant (Brinjal)	508.28	0.08	**508**	Squash	17,029	0.06	**17,029**
Knol khol (Kholrabi)	5,406.68	1,097.53	**6,504**	Tomato	917.4	220.7	**1,138**
Leek	10,034.65	1,500	**11,535**	Upland Kang kung	1,125.8	125	**1,251**
Beet root	13,510	250	**13,761**	Yard Long Bean	9,383	-	**9,383**

Table 2.1.3: Total quantity of seeds imported via Sea Port and Air Port in 2016

Crop	Quantity (kg)			Crop	Quantity (kg)		
	Sea Port	Air Port	Total		Sea Port	Air Port	Total
Papaya	1	8.54	**9.54**	Sweet corn	580	304	**884**
Water Melon	13,708.4	459.5	**14,168**	Flower seeds	0.3	41.5	**41.8**
Seed Potato	1,828,398	-	**1,828,398**	Maize	1,202,240	206	**1,202,446**
Melon	8	-	**8**	Grass Seeds	15,800	206	**16,006**

Staff Database Development

Database was developed for storing staff information of SCPPC and Institutes under SCPPC. Information of 615 employees are in the database.

Seminars/ Awareness Programs/ Trainings

- A technical officer in SCPPC served as a resource person in four awareness programs on Plant Protection Act and Plant Quarantine to one hundred and twenty officers in Department of Police.
- Training on productivity enhancement

A training program was conducted on productivity for all SCPPC staff and 2 officers from each institute under the administration of SCPPC.

Productivity Enhancement Program

As an observational tour SCPPC officers visited Badulla Prison, Haputale Post Office and Uva Management Development Institute which won productivity awards at the Productivity competition held by National Productivity Secretariat, Colombo.

In addition many activities related to Productivity enhancement programme have been continued in SCPPC.

Achievement in Productivity Enhancement Program

Up on the implementation of productivity enhancement activities in SCPPC during 2016, the SCPPC was awarded "Special commendation" in micro category at the Productivity competition held by National Productivity Secretariat, Colombo.

Collaborative work

Collaborative work with Plant Protection Service on "Survey on invasive alien plant species and their impact in selected locations in Central, North Central and North provinces in Sri Lanka" was conducted with the financial assistance of Ministry of Mahaweli Development and Environment.

PLAN FOR 2017

- Implementing relevant regulations to facilitate safe and effective handling of seeds, plants, planting materials and agrochemicals which will enhance the contribution from agriculture to Gross Domestic Product (GDP).
- After obtaining the approval from Legal Draftsman Department actions will be taken to gazette the regulations of Plant Protection Act No. 35 of 1999.
- Members for the Seed Council will be appointed and gazetted. Actions will be taken to gazette the Regulations of the Seed Act No. 22 of 2003.
- Coordination of activities in control of invasive alien species (IAS) in Sri Lanka through the IAS cell based at SCPPC.
- Monitoring of technical progress of all the institutes under the administration of SCPPC
- Promote safe use of pesticides
- Formulating appropriate plans and policy decisions related to the production of high quality seeds and planting materials.
- Upgrading seed enterprise in the country
    - Development of good quality planting material production in the country
    - Strengthening national plant health system.
    - Harmonization of regulatory measures
    - Promoting the most effective and safe pest control strategies in agriculture
    - Evaluation of the system of official control for the export of plants and plant products to the countries concerned.
    - Development of farm certification scheme in order to address the plant quarantine requirements of concern for fruits and vegetables.

STAFF LIST

Designation	No. Existing
Director	01
Additional Director	01
Assistant Director of Agriculture (Development)	01
Administrative Officer	01
Program Assistant (Agriculture)	01
Development Officer	03
Agriculture Instructor	01
Public Management Assistant	08
Driver	04
Office Employee	02
Laborer	07
Laborer (Contract)	02
Total	**32**

2.1.1 SEED CERTIFICATION SERVICE (SCS) - GANNORUWA

The Seed Certification Service (SCS) performs regulatory functions pertaining to assuring the quality of seeds and planting materials available to farmers.

Responsibilities:

- Implementation of the Seed Act
- Certification of the quality of basic seeds and planting materials before multiplication.
- Certification of the quality of commercial seeds and planting materials of Rice, Vegetables, Other Field Crops (OFC) and Potato.
- Fruit plant certification and fruit plant nursery registration
- Selection and registration of suitable Fruit Mother Plants.
- Laboratory testing of local and imported seeds for germination, viability, purity and moisture
- Post-control grow out trials for imported and locally produced seeds to evaluate the quality.
- Conducting tests on Distinctness, Uniformity and Stability (DUS), prior to release of new crop varieties
- Conducting seed health testing.
- Training and awareness for Seed growers, Nurserymen, Seed men and Officers on quality seeds and planting material production in relation to the Seed Act.
- Finding out solutions to overcome field problems on quality seed and planting material production by conducting applied seed technology research programs.
- Quality assurance of imported vegetable seeds.
- Seed quality development and promotion activities.
- Denominations of imported vegetable and OFC seeds prior to marketing.
- Database management and monitoring.
- Publishing Fruit Nurserymen Directory annually and Seed Producer's Directory seasonally.

BUDGET

Allocations received and expenditure incurred under different votes and projects are given in Table 2.1.1.1.

Table 2.1.1.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	17,320,000	17,320,000	100
Capital	18,150,000	15,270,000	84
Projects			
• Seed strengthening and seed industry development	104,000,000	91,210,000	88
• Seed Act	14,000,000	13,040,000	93

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
• AFACI (Collaboration in the construction of Epidemiology information interchange system for migratory diseases and insect pests in Asia region (IPM)	1,740,000	1,790,000	103
• Seed and planting material development Program	4,000,000	2,970,000	74
• National Food Production Program I	4,000,000	3,620,000	91
• National Food Production Program II	1,450,000	840,000	58
Total	**164,660,000**	**146,060,000**	**89**

PROGRESS

- Inspected 6,089 ha of rice, 692 ha of OFC, 88 ha of vegetables and fruits and 67 ha of potato fields cultivated for seed production.
- Tested 15,484 seed samples representing 14,414 mt of seed paddy, 594 mt of OFC seeds 28 mt of vegetable seeds and 715 mt of seed potato and 13,63,966 mini tubers.
- The registered extent of seed paddy and OFC increased by 16.5% and by 3% respectively though the extent of vegetables decreased by 34% in 2016 when compared to 2015.
- Registered and inspected 327 horticulture nurseries producing certified planting materials and quality was certified by labeling 704,101 grafted fruit plants.
- 235 mother plants were selected and labeled as quality certified.
- Evaluated 6 rice, 12 OFC, and 1 vegetables crop varieties under the DUS testing program.
- Tested 925 post control samples of rice, OFC, vegetable and potato in post control fields situated at Gannoruwa, Sita Eliya and Mahailuppallama.
- 144 samples of imported vegetable seeds were tested.
- Seed health testing was introduced to Seed quality assurance system and 70 samples were tested in seed health testing laboratory.
- Registered 499 new seed handlers under the Seed Act and renewed the registration of 636 seed handlers.
- Granted approval for 78 labels used by different seed and planting material producers under the Seed Act.
- Handled 12 inquiries related to the Seed Act and appropriate actions taken.
- 251 seed handler premises were inspected to facilitate proper channel of seed marketing.
- Regulations of Seed Act 2003 No. 22 were prepared and forwarded to the Department of Legal Draftsman.
- Trained 7,370 Government and private sector officers, Nurserymen, seed farmers and Seed handlers on Seed Act and production activities.
- Four field days were held for departmental officers at Gannoruwa Post control I and II, Sita Eliya PC III to demonstrate the

quality of Paddy, OFC and Potato seeds and varietal characters.

- A market survey was conducted to evaluate the quality of seeds available in the market which comprised laboratory and field evaluations. The results were demonstrated through a field day at Mahailuppallama to the seed importers and seed producers.
- Completed the construction of new seed testing laboratory building at Paranthan.
- Established the new SCS Office building at Murunkan.
- Developed the sprinkler irrigation systems and plant houses for post control field I at Gannoruwa and Post control field IV at Sita Eliya.
- Essential repairs on vehicles and buildings of all units of SCS were completed.
- Two radio programs were broadcast during the year 2016.
- Commenced distribution program of mother plants of departmental recommended varieties to the registered nurserymen of DOA.
- Commenced mapping of mother plants using GPS technology for mother plants.

Seed Paddy Certification

During the year 2016, individual farmers as well as several government and private sector organizations such as DOA farms, Cooperative Societies, Provincial Councils, Govi Jana Kendra, Mahaweli Authority, Irrigation Department, Farmer Organizations, Private Companies, NGOs were registered for certified seed paddy production.

Total extent registered to produce seed paddy was 6,089 ha of which the share of private sector was 77.5%. Extents registered for certified seed paddy production under different sources and seed classes are given in Table 2.1.1.2. A 16.5% increment was observed in extent registered for seed production of rice in the year 2016 when compared to that of the year 2015.

Table 2.1.1.2: Extents under Seed Paddy production in 2015 and 2016

Source	Seed class	2015		2016		Accepted %
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)	
Research stations	Breeder's	6.69	6.05	5.88	5.12	87.20
Govt. farms	Foundation I	54.99	39.64	50.80	38.86	76.25
	Foundation II	0.20	0.20			
	Registered I	662.59	466.89	604.57	565.05	93.46
	Registered II	43.08	43.08	30.45	30.24	99.31
	Certified I	86.08	65.18	106.07	89.68	84.55
	Certified II	35.24	31.64	11.13	9.72	87.33
Contract growers	Foundation I			1.42	0.61	42.95
	Registered I			154.45	74.39	48.16

Source	Seed class	2015		2016		Accepted %
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)	
Contract growers	Certified I	395.84	305.80	363.56	302.02	83.07
	Certified II	129.35	114.37	40.08	30.97	77.27
Private growers	Registered I	141.18	120.84	512.51	379.05	73.96
	Certified I	2,964.14	2,329.93	3,885.33	2,729.89	70.26
	Certified II	682.73	572.91	315.99	250.91	79.40
	Commercial I	22.47	17.41	7.49	1.62	21.63
	Commercial II	0	0			
Total		**5,249.67**	**4,131.14**	**6,089.73**	**4,508.13**	**74.03**

During the year 2016, a total of 14,414 mt of seed paddy was sampled of which the quality standards of 11,878 mt of seed paddy were accepted by laboratory tests (Table 2.1.1.3). DOA farms with contract grower programs produced 4,782 mt (33%) while Private growers produced 9,632 mt (67%).

Table 2.1.1.3: Quantities of seed paddy tested and % accepted in 2015 and 2016

Source	2015		2016	
	Quantity tested (mt)	Accepted %	Quantity tested (mt)	Accepted %
Research stations	5.81	94.4	8.48	92.5
Govt. farms	3,659.7	91.5	3,453.7	89.8
Contract growers	1,420.6	81.9	1,328.4	83.4
Private growers	9,839.4	81.9	9,632.0	79.5
Total	**14,925.51**		**14,414.5**	

Certification of Other Field Crops (OFC) seeds

The total registered extent under OFC seed production was 692 ha of which contract growers accounted for 84%. Maize, Green gram, Groundnut, Sesame, Cowpea, Finger millet, Horse gram, Mustard, Black gram and Soybean were included in the OFC seed production program. Extents registered for seed production under different sources and classes are given in Table 2.1.1.4. There was a slight increment (3%) in registered extent for OFC seed production when compared to 2015.

Table 2.1.1.4: Extents under OFC seed production 2015 and 2016

Source	Seed class	2015		2016		Accepted %
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)	
Research stations	Breeders	4.2	3.5	5.46	5.38	98.5
Govt. farms	Foundation	13.87	9.63	16.58	13.83	83.41
	Registered I	54.33	36.88	43.09	37.24	86.42
	Registered II	0.7	0.7			
	Certified I	5.91	5.91	7.29	4.45	61.04
	Certified II	1.36	0.15	1.42	0.81	
	Hybrid	3.98	3.95	2.02	1.82	90.10
	Commercial	0.2	0.2	2.83	2.63	92.93
Contract growers	Registered I	36.85	21.48	98.28	74.29	75.59
	Registered II	3.61	3.21	4.45	4.45	100.00
	Certified I	338.53	257.01	261.7	194.09	74.17
	Certified II	150.8	101.03	164.57	76.11	46.25
	Commercial I	25.3	14.98	27.63	12.04	43.57
	Commercial II	0.81	0.4	31.28	27.94	89.32
Private growers	Foundation	2.43	0.4			
	Registered I			6.07	0.81	13.34
	Certified I	10.12	4.05	11.53	4.66	40.42
	Certified II	3.85	1.4	6.58	0.4	6.08
	Commercial I	8.5	1.82	1.21	0.2	16.53
	Commercial II	0.81	0.81	0.81	0.81	100.00
Total		**662.06**	**464.01**	**692.8**	**461.96**	**66.68**

In 2016, total OFC seed production was 594 mt of which 91% was certified. It was a 13% increment when compared to that in year 2015, Quantities tested and percentages accepted from different sources are given in Table 2.1.1.5.

Table 2.1.1.5: Quantities of OFC seed tested in 2015 and 2016

Source	2015		2016	
	Quantity tested (mt)	Accepted (%)	Quantity tested (mt)	Accepted (%)
Research stations	1.57	79.2	2.4	69.7
Govt. farms	52.7	83.5	82.7	91.7
Contract growers	439.6	82.7	502.7	91.4
Private growers	29.3	74.65	6.7	83.9
Total	**523.17**		**594.5**	

Certification of vegetable seed production

Registered extent for vegetable seed production was 88 ha of which government and contract growers accounted for 67%. Total extent of vegetable seed production recorded a 34% reduction in 2016 when compared to that in the year 2015. Registered land extents under different sources and seed classes are given in Table 2.1.1.6. Tomato, Okra, Chilli, Red onion, Big onion, Snake gourd, Bean, Brinjal, Bitter gourd, Radish, Luffa, Capsicum, Yard long bean, Cucumber, Pumpkin, *Amaranthus*, Vegetable cowpea, Winged bean, Water melon, and Papaya were included in the seed production program.

Table 2.1.1.6: Vegetable seed production extents (ha) by class and source in 2015 & 2016

Source	Seed class	2015		2016		Accepted %
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)	
Research stations	Breeders	1.5	1.46	1.71	1.21	70.46
Govt. farms	Basic	7.77	6.77	1.42	1.21	85.21
	Standard I	35.53	25.91	19.5	14.4	73.85
	Hybrid	0.9	0.9	0.2	0.2	100
Contract growers	Standard I	39.83	35.8	30.79	20.63	62.00
	Commercial	2.02	2.02			
Private growers	Standard I	50.16	41.06	34.81	26.01	74.72
Total		**134.19**	**110.44**	**88.43**	**63.66**	**71.99**

Table 2.1.1.7: Quantities of Vegetable seed production in 2015 and 2016

Source	2015		2016	
	Quantity tested (mt)	Accepted (%)	Quantity tested (mt)	Accepted (%)
Research stations	0.31	58.5	0.30	91.25
Govt. farms	9.2	82.8	7.55	86.17
Contract growers	15.5	99.5	11.56	95.93
Private growers	19.5	86.3	9.27	94.33
Total	**44.51**		**28.68**	

During the year 2016, total vegetable seed production was 28 mt of which 26 mt were certified. It was a 35% reduction when compared to that of the year 2015. Quantities tested and percent accepted from different sources are given in Table 2.1.1.7.

Seed Potato Certification

Extents cultivated of seed potato belonging to different seed classes are given in Table 2.1.1.8. The total extent of land cultivated with seed potato was 67 ha and a total amount of 715 mt of popular seed potato variety Granola was certified. Although there was a slight reduction of extent registered, production increased by 107% in the year 2016 when compared to the year 2015. Also, 1,363,966 mini tubers produced which represent boost increment (105%) in the year 2016 when compared to the year 2015. Quantities of mini tubers tested from different sources are given in Table 2.1.1.9.

Table 2.1.1.8: Extents under seed potato production in 2015 and 2016

Source	Class	2015		2016	
		Extent registered (ha)	Extent accepted (ha)	Extent registered (ha)	Extent accepted (ha)
Govt. farms	Pre-basic	1.65	1.56	0.19	0.19
	Basic	57.26	42.14	5.82	5.41
	Certified	0.4	0	50.51	49.20
Private growers	Pre-basic	0.30	0	0	0
	Basic	12.65	11.84	0	0
	Certified	5.06	4.85	10.93	10.93
Total		**77.32**	**60.39**	**67.45**	**65.73**

Table 2.1.1.9: Production of mini tubers of Potato

Source	No. of Plants/ Extent/ No. of Pots	No. of mini tubers
Govt. farms	50,067 plants	877,980
	1961m^2	333,959
Private growers	4,710 plants	73,102
	1,970 pots	18,925
	400m^2	60,000
Total		**1,363,966**

Seed Testing

15,484 seed samples were tested for quality certification at the DOA seed testing laboratories in Peradeniya, Mahailluppallama, Aluttarama and Batata.

Seed Health Testing Unit

105 seed samples were tested for seed borne pathogens at the DOA seed health testing laboratory in Peradeniya.

Certification of Planting Material

A total of 704,101 fruit plants produced in government nurseries and private nurseries were certified and labeled (Table 2.1.1.10).

Table 2.1.1.10: Number of grafted fruit plants certified in 2015 and 2016

Species	No. of plants certified	
	2015	2016
Mango (Grafted)	264,484	328,707
Rambutan (Grafted)	99,505	109,099
Citrus (Grafted)	210,558	251,477
Avocado	3,795	5,081
Durian	212	2,818
Jak	3,626	4,257
Pears	500	1,653
Others	282	1,009
Total	**582,962**	**704,101**

Registration of nurseries

Total number of plant nurseries registered in 2016 was 327.

Mother plant certification

During the year 2016, a total number of 235 Mango, Rambutan, Citrus, Durian, Goraka, Jack and Avocado mother plants were selected and registered.

Table 2.1.1.11: Number of mother plants registered in 2015 and 2016

Species	No. of Plants Registered	
	2015	2016
Mango (Grafted)	253	99
Rambutan (Grafted)	24	42
Citrus	59	50
Avocado	02	01
Durian		32
Jak		04
Other		07
Total	**338**	**235**

Post Control Testing

Post control tests were conducted to evaluate 925 seed samples. These include DOA certified seed samples, imported seeds of different crop varieties, seed Potato, samples collected from market and problematic samples. Number of post control tests conducted, under different crop categories are given in Table 2.1.1.12.

Table 2.1.1.12: Number of post control samples tested

Crop group	No. of lots tested
Rice	185
OFC	195
Vegetables	437
Potato	108
Total	**925**

Distinctness, Uniformity, and Stability (DUS) Testing

Six rice varieties (Bg 96-741, Bg 19-09, Bg 07-1350, CIC Rathu Suduru, Bg 10-2907, Bg 25-1) were tested for DUS at post control fields in Gannoruwa. One vegetable variety and 12 OFC varieties were also tested. DUS testing of 6 Rice, 1 Vegetable and 9 OFC varieties were completed during the year concerned.

Table 2.1.1.13: Number of DUS Tests Conducted

Crop Group	No. of tests conducted	No. of tests completed
Rice	06	06
OFC	12	09
Vegetables	01	01
Fruit	01	
Total	**20**	**16**

Implementation of Seed Act

Seed Act No. 22 of 2003 has been implemented from 2008 with the objective of safeguarding farmers and seed handlers from malpractices that would harm the seed industry of this country which is a vital sector of the country's agriculture. A total of 499 Seed handlers were registered and there were 636 renewals under the Seed Act during the year 2016. Twelve complaints were received; inquired and remedial actions were taken to safeguard the farmers.

251 random inspections of seed handler premises were carried out in order to assess the present situation and to advise them on proper handling of seed and planting material prior to marketing. Four workshops were held to finalize regulations of the Seed Act and the draft was forwarded to the Department of

Legal Draftsman during this year. 52 training programs were held to make 5,005 government and private sector officers and seed handlers aware of provisions of the Seed Act.

Research and Development

Research Projects

- AFACI (Collaboration in the construction of Epidemiology Information Interchange System for Migratory Diseases and Insect Pests in Asia Region (IPM)).
- Development of a package of practices for managing seed borne diseases.
- Development of seed film coating techniques for vegetable seeds.
- Determination of standard example verities for DUS testing of Cowpea.

Technology Dissemination

Radio programs

- Quality planting material production (SLBC)

TV programs

- Seed Act

Training Programs

SCS continued to conduct training programs to enhance the knowledge of officers and seed handlers on production of quality seeds and planting materials.

Table 2.1.1.14: Number of officers and seed handlers trained

Training Programs	No. of Trainees
Seed farmers	270
Nurserymen	30
Govt. sector Officers	3,885
Private sector Officers	1,070
Other seed handlers	2,065
Total	**7,320**

SCS Database Management System

A new online database system was established this year in seed and planting material with the collaboration of JICA, Seed and Planting Material Development Center and Seed Certification and Plant Protection Centre. It is started to entering data from 24 regional SCS units. All regional units were facilitated with required internet and computer amenities.

Foreign Training

Nineteen officers were trained in China, Estonia, Japan, Cambodia and Thailand as follows.

Table 2.1.1.15: Foreign trainings during 2016

Country	No. of trainees	Training Title
Estonia	01	ISTA Work shop
China	13	Agriculture and food products safety management, Import and Export commodity quality inspection for the developing countries.
Japan	02	Seed health testing, Plant variety protection and quality control systems
Cambodia	01	AFACI/ Expert workshop
Thailand	02	Vegetable seed production

PLAN FOR 2017

- Empowering seed certification service to achieve the target of fulfilling 30% of the national seed paddy requirement by certified seeds.

- Establishment of seed research unit to conduct seed technology research pertaining to the seed quality encountered by seed handlers especially on seed packaging, storing and expiry dates.
- Conducting survey for identification of major seed borne pathogens
- Development of detection techniques for seed borne pathogens of major crops
- Studies on effect of seed borne pathogens on seed health and storability of stored seeds of vegetable crops.
- Seed Act implementation to regulate the seed production process among state and private sector seed handlers to make available high quality seeds and planting materials in the country while avoiding malpractices in the seed industry.
- Preparing guidelines on quality seed and planting material production to distribute among all seed handlers.
- Preparation of technical guidelines for DUS testing and varietal purity testing of Cowpea
- Develop mobile application of other field crops for variety identification.
- Preparation and distribution of seed producers' directory and planting material producers' directory in each growing season.
- Publishing crop guidelines for seed handlers.
- Establishment of mapping system for mother plants island wide using GPS. (Geological positioning System).
- Publish a mother plant directory for public awareness
- Characterization of fruit plant varieties.
- Preparation of training modules for production of quality seeds and planting materials for seed farmers and nurserymen.
- Construction of a new SCS regional sub office in Monaragala.
- Construction of new SCS regional office buildings in Bathalagoda and Rikillagaskada.
- Strengthening all SCS units with staff and infrastructure facilities.

STAFF LIST

Designation	No. Existing
Deputy Director	01
Assistant Director of Agriculture (Research)	02
Assistant Director of Agriculture (Development)	12
Agricultural Monitoring Officer	03
Program Assistant (Agriculture)	02
Development Officer	17
Agricultural Instructor	109
Research Assistant	02
Technological Assistant	39

Designation	No. Existing
Public Management Assistant	10
Driver	18
Tractor Operator	03
Storeman	03
Electrician	01
Research Sub Assistant	03
Seed Technician	10
Seedman	29
Circuit Bungalow Keeper	01
Watcher	39
Laborer (Permanent)	111
Sanitary Laborer	01
Laborer (Contract)	19
Total	**435**

2.1.2. PLANT PROTECTION SERVICE (PPS) - GANNORUWA

The mandate of the Plant Protection Service revolves around regulatory activities within the country stipulated by the Plant Protection Act No. 35 of 1999. When an alien pest enters the country and begins to affect the crops in a detrimental manner the responsibility of dealing with it lies with the Plant Protection Service.

The core activities of Plant Protection Service can be stated as control of pest/disease outbreaks, implementation, monitoring and evaluation of field level IPM programs in rice and vegetables managing pests in bulk seed storage in Department of Agriculture farms through fumigation, conducting research in pest management and pesticides.

Mitigating the impact of aquatic weeds and other invasive flora on agriculture habitats, training of officers and farmers, evaluation of new pesticides including botanicals at pilot scale, revalidating efficacy of recommended pesticides to ensure the plant health of agricultural crops are also mandatory functions assigned to the Plant Protection Service.

Furthermore, the Plant Protection Service has been given the task of coordinating activities of the Permanent Crop Clinic Program (PCCP) which is a collaborative program with CABI (Center for Agricultural Bioscience International) and currently implemented in 24 districts in the country.

Vision

Achieve excellence in Agriculture through safe and effective Plant Protection strategies.

Mission

Adopting the provisions of the Plant protection Act No.35 of 1999 while promoting effective pest management strategies which cause least harm to the environment ensuring protection of local agriculture.

BUDGET

2.1.2.1: Annual budget -2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	2,331,577	1,904,041	82
Capital	1,950,000	1,645,315	84
Projects			
• National Food Production Program	9,360,000	5,250,000	56
Total	**13,641,577**	**8,799,356**	**65**

PROGRESS

Implementation of Plant Protection Act No. 35 of 1999

71 new authorized officers were directly appointed in Northern Province to implement the Plant Protection Act. They were also trained on

- Legislative background of the Plant Protection Act No. 35 of 1999.
- Implementation of Plant Protection Act at field level
- New pests with quarantine significance in Sri Lanka

Thirty (30) authorized officers were trained on the implementation of the Plant Protection Act No.35 of 1999.

Permanent Crop Clinic Program

Permanent Crop Clinic Program (PCCP) has been the responsibility of PPS since March 2013. It is a collaborative program with the Center for Agricultural Bio Science International (CABI) in United Kingdom and DOA.

The program aims to strengthen national plant health system through developing local capacity to establish and manage PCCP.

The partnership with CABI aims to promote sustainable agricultural practices that enhance productivity, improve the livelihood of small-holder farmers and protect biodiversity.

PPS has been given the responsibility as the National Responsible Organization (NRO) to coordinate with national partners in managing crop clinics. The Deputy Director (Plant Protection) is functioning as the National Coordinator of PCCP. Some of the highlights of PCCP are mentioned below.

20 senior level officers selected from Research and Extension divisions were trained as "master trainers" through modules 1,2,3 and 4 on the following aspects.

- How to become a "Plant Doctor"
- Managing plant health problems
- How to become a technical writer and green and yellow lists
- Monitoring and Evaluation of crop clinics

A total of 548 Agriculture extension officers were trained as Plant Doctors in 11 districts (Tables 2.1.2.2 and 2.1.2.3).

The Plant Protection Service organized many training workshops for national trainers within the country (Table 2.1.2.4). Also a progress review and way forward meeting on this Permanent Crop Clinic Program (PCCP) was held at the Hotel Topaz, Kandy with the participation of relevant officials.

Table 2.1.2.2: Number of trained plant doctors (Module 1)

District	Date	Number of trained plant doctors
Monaragala	28 to 30 March, 2016	43
Kalutara	12 to 14 May, 2016	31
Kilinochchi	25 to 27 June, 2016	22
Ampara	11 to 12 August ,2016	37
Matale	22 to 28 August ,2016	38

District	Date	Number of trained plant doctors
Hambantota	26 to 28 September, 2016	38
Matara	03 to 05 October, 2016	82
Total		**326**

Table 2.1.2.3: Number of trained plant doctors (Module 2)

District	Date	Number of trained plant doctors
Puttalam	11 to 13 February , 2016	44
Kurunagala (G 1 & G 2)	17 to 18 March, 2016 28 to 29 March, 2016	83
Hambantota	26 to 28 September, 2016	30
Badulla	08 to 09 December, 2016	34
Kalutara	19 to 20 December, 2016	31
Total		**222**

Table 2.1.2.4: Number of workshops for national trainers

Topic	Date	No. of Participants
E- Crop Clinic Review	February	12
POMS training for DOA higher staff	February	20
TOT E- crop clinic for Master trainers	February	10
TOT M1 and M2 for District Coordinators	February	14
TOT M1 and M2 for District Coordinators	February	14
Data Validation Training	May	14
Data Validation and Analysis Training	May	14
Monitoring and Evaluation Workshop	August to September	35
Data Management Workshop	October	08
Data Management Workshop	October	15
TOT M1 and M2 for District Coordinators	November	13
Progress Review and Way forward Workshop	December	72

Promotion of Integrated Pest Management (IPM) and Good Agricultural Practices (GAP)

Programs were conducted to improve the knowledge of extension officers and farming communities in IPM and GAP giving special attention to minimize the use of pesticides to promote the application of non-chemical pest management strategies and to certify efficient pest management in farmer field level. The program was focused on four crop categories namely paddy, vegetables, other field crops and leafy vegetables.

- **Rice IPM / GAP Program**

White revolution is the new concept of Department of Agriculture which aims to

promote judicious use of pesticides. Main objective of this program is reducing pesticide usage to combat pesticide induced health problems and environmental pollution. 293 extension officers and 627 farmers participated at these trainings. Those were focused to identify pests and natural enemies at each growth stage and manage pest population below economic injury level, by applying different strategies which are applicable under farmer field conditions. It was also aimed on conservation of natural enemies in the agro-ecosystem and managing the pest population.

- **Vegetable IPM / GAP Program**

This was implemented to develop low cost, environment friendly and practicable IPM packages for vegetables and to promote them among extension officers and farmers. Number of training programs for extension officers were conducted at different locations where a total of 463 officers and 702 farmers were trained. One television program was also telecast to promote this technology.

- **Leafy vegetable IPM/ GAP Program**

This was mainly conducted in the Western Province and was organized by the PPS unit at Bombuwala wing of the PPS. 133 relevant farmers were trained.

Management of Banana Skipper (*Erionota* sp.)

Sporadic outbreak of banana skipper which occurred in a few districts was identified as *Erionota* species. An IPM package was developed based on the biology and ecology of the species. In order to enhance the pest management effort, 60 extension officers from different districts were trained.

Pilot scale testing of weedicides

Eleven new herbicides which are better than the already recommended herbicides in their target specificity and lower application rates were evaluated under farmer field conditions for their bio-efficacy.

Biological control program for Aquatic weeds

Cultures of bio-control agents *Cyrtobagous salviniae* for Salvinia (*Salvinia molesta*) and *Neochetina bruichi* as well as *Neochetina eichhorniae* for water hyacinth (*Eichhornia crassipes*) are maintained by PPS. Introduction of these bio-control agents was conducted as per requests made by government, private or non-government organizations. In each of these occasions awareness programs were conducted at the site for stakeholders about the life cycle of released bio control agents and the interaction with the targeted weed. Under this program bio-control agents were introduced to 13 infested reservoirs across several districts.

Technical Assistance in Fumigation for Stored Seeds in DOA Farms

3021.1 mt of seed materials (rice 2186.3 mt, other field crops 553.9 mt and vegetable seeds 280.9 mt) were fumigated to control storage pest attacks in Ambalantota, Pelwehera, Kantale, Polonnaruwa, Murunkan, Kilinochchi, MahaIluppallama, Nikaweratiya and Aluttarama DOA seed storages.

Technical Assistance for Field Rat Management

197 DOA officers and 124 farmers were trained to manage rice field rats in several districts.

Technical Assistance to Control Invasive Weeds

Control programs on invasive weed Parthenium (*Parthenium hysterophorus*), Alligator *(Alternantheraphilo xeroides)* and Giant mimosa *(Mimosa pigra)* were technically assisted in many areas. 370 officers and 78 farmers were trained on the management of alien invasive species.

Pest surveillance programs

Paddy pest infestation data were collected from extension areas of nineteen districts and a database was developed. These data were utilized to prepare a summary with graphical presentation, which was distributed back to them. In addition, short messages on current incidences of pest situation were frequently broadcast through the radio to alert farmers on present pest problems.

Promotion of natural/ herbal pesticides to reduce synthetic pesticides

185 Officers and 822 farmers from various districts were trained in order to promote the use of herbal pesticides as an alternative for synthetic pesticides. Five radio programs were broadcast to promote this technology.

Control of pest / diseases in sacred "Bo" trees

Three sacred "Bo" trees belonging to several historic temples were treated to protect them from some pest/ disease infections such as termites, fungal diseases etc.

Exhibitions

Eco-friendly pest management technologies and other activities of PPS were demonstrated for public in "Wasa wisen thora hetak" exhibition at BMICH, Colombo.

PLAN FOR 2017

- Implementation of Plant Protection Act No. 35 of 1999
- Promotion of Permanent Crop Clinic Program
- Promotion of integrated pest management (IPM) and good agricultural practices (GAP) for rice, vegetables and leafy vegetables
- Pilot scale testing of weedicides
- Biological control program for aquatic weeds
- Technical assistance in fumigation of seed storages of DOA farms
- Technical guidance to manage termites in DOA premises
- Technical guidance to manage rice field rats
- Technical assistance to control invasive weeds
- Technical guidance to manage dangerous agricultural pest problems
- Promotion of pest surveillance programs
- Promotion of the use of herbal pesticides
- Control of pest/ diseases in sacred "Bo" trees
- Live participation in agricultural exhibitions

STAFF LIST

Plant Protection Service, Gannoruwa

Designation	No. Approved	No. Existing
Additional Director	01	-
Deputy Director	09	01
Assistant Director of Agriculture (Research)	02	-
Assistant Director of Agriculture (Development)	11	01
Program Assistant (Agriculture)	01	01
Development Officer	02	02
Agriculture Instructor	05	05
Public Management Assistant	04	04
Driver	05	05
Lorry Cleaner	01	01
Watcher	02	02
Laborer	07	05
Office Assistant	01	01
Laborer (Contract)	01	01
Total	**52**	**29**

Plant Protection Unit, MahaIluppallama

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Development)	01	01
Agriculture Instructor	03	01
Driver	01	01
Laborer	01	-
Total	**06**	**03**

Plant Protection Unit, Bombuwala

Designation	No. Approved	No. Existing
Assistant Director of Agriculture (Development)	01	-
Assistant Director of Agriculture (Research)	01	01
Agriculture Instructor	02	02
Laborer	01	-
Total	**05**	**03**

2.1.3 OFFICE OF THE REGISTRAR OF PESTICIDES (ROP) - PERADENIYA

Registrar of Pesticides (ROP) is the legal authority empowered and entrusted on the functions related to the registration and regulation of pesticides in Sri Lanka (appointed under the Control of Pesticides Act No. 33 of 1980, as amended by the Act No. 06 of 1994 & the Act No. 31 of 2011). According to the Act, it is the duty of the ROP (who is responsible to the Director General of Agriculture, DGA) to regulate pesticides imported to and produced in Sri Lanka, and to assure their quality and safe use, and to assess and to declare Maximum Residue Limits (MRLs) in agricultural produce.

The overall workload of the Office of the Registrar of Pesticides has been gradually strengthened to represent registration of pesticides imported to Sri Lanka and giving import permits, regulating labels and advertisements, registering pesticide importers, pest control services and pesticide traders, random quality checking of imported pesticides and testing pesticide residues in agricultural produce. The pesticide regulatory activities that have been managed by the ROP can be divided into two main categories as regulation of pesticides by registration and post-registration activities. However, for effective and total regulation of pesticides in the country, it is paramount that post-regulation activities are managed equally or much more intensively than in-house registration activities. The post-registration activities include (among others): monitoring of pesticide formulation and re-packing factories, storage sites and outlets, detection of unauthorized activities and taking legal actions, analysis for pesticide quality, analysis of pesticide residues in/on agricultural products and setting legally allowed MRLs in food, monitoring of pesticide poisonings, etc.

In addition, many new challenging developments are continuously arising and sparingly managed with the current facilities available at the Office of the Registrar of Pesticides. Some of such challenges includes, disposal of pesticide containers, determination of heavy metals in pesticides, conducting regular programs on MRL testing, regulating pesticides sales and use in the field through Authorized Officers, and taking legal actions against offenders of the Act.

The society has voiced its concern of the fact that Office of the Registrar of Pesticides does not test, on its own, the quality and presence of impurities in pesticides that are harmful to human health and other organisms in the environment. Unless remedial actions are taken within a short period of time, the reliability of the whole process of pesticide regulation will be in jeopardy. Proposals have been submitted to the government for keeping positivity on such aspects & for strengthening the existing system to manage with utmost efficiency and to keep up mandates for the sake of the public and the environment.

As highlighted in subsequent sections, the Office of the Registrar of Pesticides has been able to create momentum for setting up of several environmental safety advocacy

programs such as empty pesticide container management and the management & disposal of obsolete pesticides. Examples of other significant initiatives and accomplishments include: plans for divisional arrangements in the office setup; development of registration procedures for indigenous biological pesticides; regulation of high-risk pesticides; upliftment of laboratory analytical calibre by participating in international assessment for ISO/IEC 17025: 2005 accreditation & laboratory procurements; applicator safety initiatives; continuous improvement in training & awareness raising on pesticides and participating at local & international auditing on pesticide and residue management systems in Sri Lanka.

BUDGET

The annual allocation and expenditure under different votes are given in the following table.

Table 2.1.3.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)	Income (Rs.)
Recurrent	4,313,799	4,023,875	93	
Capital	2,405,000	1,772,698	74	
Minimize potential adverse effects of pesticides in Sri Lanka (Special grant)	5,000,000	4,994,790	100	
1. Registration fee				7,542,500
2. Re-registration fee				416,000
3. Pesticide dealer license fee				803,550
4. Pest control service registration fee				100,000
5. Pest control service license renewal fee				205,000
6. Import lisence fee				684,000
7. Company registration fee				600,000
8. Agrochemical sales & Technical Assistant application fee				46,600
9. Miscellaneous				3,300
Total	**11,718,700**	**10,791,362**	**92**	**10,400,950**

PROGRESS

No.	Item/Activity	Total Annual Physical Target	Achievement up to End of 2016	%
01. Program for registration of pesticides				
1	Acceptance of applications for registration	30	20	67
2	Acceptance of applications for re-registration	150	67	45
3	Evaluation of registration packages for registrations	30	56	183
4	Evaluation of re-registration applications	140	74	53
5	Evaluation of secondary registration applications	140	59	42
6	Preparation of original registration certificates for approval	280	191	68
7	Pesticide Technical & Advisory Committee meetings	6	5	83
8	ROP company dialog to inform the PeTAC decisions	6	1	17
9	Pesticides sub-committee meetings	18	8	44
10	Co-ordination of pesticides testing with the DOA (for bio-efficacy)	30	25	83
11	Evaluation & preparation of data for sub-committees	30	147	490
02. Program for awareness on all relevant target groups assurance of safe use and judicious marketing of pesticides & collection & compilation of pesticides related data				
1	Media Programs:			
	a) TV Programs	2	3	150
	b) Radio Programs	6	7	117
	c) Print Media Programs	4	2	50
2	Training / Certification of Agrochemical Sales and Technical Assistants (ASTA)	500	340	68
3	Awareness/ Exhibition	3	3	100
4	Awareness program for the Autorized Officers/ Enforcement Officers	10	7	70
5	Dealer training classes	15	16	107
6	Publishing revised guidelines for registration of pesticides / biocides and guidelines for new comers for the pesticide industry who needs to import pesticides	2	2	100
7	Participation as resource personal for invitations from the DOA/ other institutes	10	51	510
8	Collection, compilation & dissemination of import statistics (Central Bank, Universities, Researches, Govt. Institutes etc.)	10	18	180

No.	Item/ Activity	Total Annual Physical Target	Achievement up to End of 2016	%
03. Program for compliance monitoring (Product quality and residues in environmental compartments & action against violation of the Control of Pesticides Act, No. 33 of 1980)				
1	Issue of import approvals	1000	731	73
2	Issue of sample import approvals	100	78	78
3	Evaluation of quality certificates	350	282	81
4	Screening of labels for approval	500	1750	350
5	Screening of advertising materials for approval	150	143	95
6	Inspection of factories	12	4	33
7	Inspection of approved repacking facilities & stores	12	5	42
8	Inspection of premises for fumigation & house-hold pest control operators	30	7	23
9	Registration of pest control services	10	10	100
10	Development and implementation of programs for empty container disposal	2	9	450
11	Inspection of sales outlets	20	29	145
12	Field complaints	6	12	200
13	Legal prosecution	4	10	250
14	Approval of obtaining CH_3Br for quarantine & reshipment treatments on accountable basis	150	109	73
15	Dispatch of samples to the MRI & other institutes for obtaining test reports on suitability for acceptance of applications	25	15	60
16	Issue of dealer training certificates	450	656	146
17	Issue of dealer certificates	2000	1461	73
18	Issue of packing clearance as per the quality analysis of samples on consignment basis	150	209	139
19	Formulation analysis	400	475	119
20	Number of residue analysis*	200	348	174
21	Number of heavy metal analysis**	400	515	129
22	Random checking of pesticide impurities	12	2	17
23	Restricted pesticides issuing letters for pest control services	700	819	117
24	Evaluation notifications send by the European Union (EU) (on pesticides residue)	7	3	43

No.	Item/ Activity	Total Annual Physical Target	Achievement up to End of 2016	%
25	The EU audit to Sri Lanka to evaluate control of pesticides in food of plant origin intended for export to the EU			
25.1	Field inspection	30	39	130
25.2	Sample collection/sample analysis	50	93	186
26	Other activities (such as field surveys)	4	56	1400
	Number of residue analysis*, Number of heavy metal analysis**= Number of injections			
04. Program for participation as technical experts/members/resource personal in intra & inter departmental organization meetings				
1	Ozone Unit of the Ministry of Mahaweli Development & Environmental	4	2	50
2	Basal / Montreal /Stockholm /Rotterdam Conventions	2	9	450
3	Department of Customs	2	2	100
4	Ministry of Health	4	11	275
5	Ministry of Agriculture	4	15	375
6	National Library Services Council	3	5	167
7	Sri Lanka Tea Board	2	2	100
8	Ministry of Mahaweli Development & Environmental/ CEA	4	12	300
9	Sri Lanka Standard Institute	2	7	350
10	Other	6	28	467
05. Program for income generation				
1	Fee for Agrochemical Sales & Technical Assistants (ASTA)	750 cheques of Rs. 100.00	(466) 46,600.00	62
2	Fee for dealer certification (Pesticide sales outlets)	2,000 Money Order/ Cheques of Rs. 550.00	(1461) 803,550.00	73
3	Permit fee for import approval	1,000 Money Order/Cheques of Rs. 1,000.00	(684) 684,000.00	68
4	Filing fee for restricted pesticides	10 Money Order/ Cheques of Rs. 6,500.00	(4) 26,000.00	40
5	Registration fee for restricted pesticides	60 Money Order/Cheques of Rs. 4,000.00	(6) 24,000.00	10
6	Re-registration fee for restricted pesticides	10 Money Order/Cheques of Rs. 4,000.00	(14) 56,000.00	140

No.	Item/ Activity	Total Annual Physical Target	Achievement up to End of 2016	%
7	Filing fee for general/domestic pesticides	60 Money Order/ Cheques of Rs. 68,500.00 (5) + Rs. 75,000.00 (68)	(73) 342,500.00 + 5,100,000 = 5,442,500.00	122
8	Registration fee for general/domestic pesticides	60 Money Order/ Cheques of Rs. 25,000.00	(82) 2,050,000.00	137
9	Re-registration fee for general/domestic pesticides	60 Money Order/ Cheques of Rs. 4,000.00	(90) 360,000.00	150
10	Registration fee for pest control services	20 Money Order/ Cheques of Rs. 20,000.00	(5) 100,000.00	25
11	Re-registration fee for pest control services	20 Money Order/ Cheques of Rs. 5,000.00	(41) 205,000.00	205
12	Filling fee for company registration	10 Money Order/ Cheques of Rs. 50,000.00	(3) 150,000.00	30
13	Registration fee for company registration	10 Money Order/ Cheques of Rs. 50,000.00	(9) 450,000.00	90
14	Miscellaneous		3,300.00	
Total			**10,400,950.00**	

REGISTRATION OF PESTICIDES

Pesticide registration is a scientifically-based, legal, and also administrative process, where a wide variety of effects associated with the use of a pesticide product and its potential effect on human health and the environment is assessed. The registration is an important step in the management of pesticides as it enables authority primarily to determine which pesticide products are permitted to be used and for what purposes, and also to exercise control over quality, usage rates, claims, labeling, packaging and advertising of pesticides, thus ensuring that the best interest of end-users as well as the environment are well protected. Compulsory registration & re-registration on a regular schedule (3-year term) are considerable undertakings for pesticide management in the country. In addition, the registration process is restricted on the assumption that pesticides are only used for their intended function and envisages proving that such use does not promote unreasonable effects either on human health or the environment.

Before any pesticide can be used commercially, several tests and/or verification assessments are conducted including bio-efficacy (or based on scientifically-accepted data assessment submitted by the registrant from most authoritative sources) that

determine whether a pesticide has any potential to cause adverse effects on recommended crops, humans and wildlife, including non-target organisms, or potential to contaminate surface waters and groundwater from leaching, runoff, and spray drift.

Sri Lanka is one of the lowest pesticide using countries in the world. According to the general use statistics of pesticides, 0.308 g of active ingredients per hectare of arable lands are being used whereas 1.056 g of active ingredients are being used per hectare of actively cultivated lands. For comparison purposes, 0.998 g of active ingredients per hectare of arable lands are being used in the USA, while 4.676 g and 5.947 g of active ingredients per hectare of arable lands are being used in China & Japan, respectively (www.wikipedia.org pesticides). As per the use statistics of commodity pesticides, 59% decline of imports were recorded viz., 6,843 metric tons in 2013 vs. 2,825 metric tons in 2015. The abrupt reduction of imports was due to stringent control over high volume pesticides such as Chlorpyrifos, Carbaryl, Carbofuran, Propanil & Glyphosate.

Status of registration of pesticides

There are approximately 190 active substances representing 647 registered pesticides in commercial use in Sri Lanka. Out of all active substances, 107 active substances are used in agriculture and the corresponding number of registered products is 459 as of December 2016. Statistical data of import of formulated pesticides shows that 1759.06 metric tons of insecticides, 2862.74 of metric tons of herbicides and 1233.8 metric tons of fungicides have been imported to Sri Lanka during the year of 2015. (Table 2.1.3.2)

Table 2.1.3.2: Import of formulated and technical grade pesticides to Sri Lanka during 2010-2015 (mt)

Type of Pesticide	2010	2011	2012	2013	2014	2015
Technical Material						
Insecticides	144.38	90.5	63.32	88.22	34.48	115.84
Herbicides	1,605.58	1,184.94	377.8	197.06	705.4	751.7
Fungicides	2	0.4	0.75	0	0	0
Formulations						
Insecticides	1,843.95	1,712.58	959.37	1,243.46	702.91	1,759.06
Herbicides	5,366.63	5,031.05	4,753.01	5,958.32	4,081.83	2,862.74
Fungicides	1,048.02	949.40	776.44	987.15	935.92	1,233.8

As pursuant to the requirements under the Section 9 of the Control of Pesticides Act No. 33 of 1980, a complete list of registered pesticides was compiled and published in the Government Gazette Extraordinary No. 1994/71 dated 24.11.2016. This document, which was last published in 2002, provides legal endorsement for products as per the first tiered risk management, viz., general pesticides (459 products representing 107 active ingredients), domestic pesticides (66 products representing 27 active ingredients) and restricted pesticides (122 products representing

56 active ingredients), depending on the risk involved.

During the year 2016, 56 registration applications were screened (Table 2.1.3.3). In this process, relevant information and documents were evaluated upon submission by the registrant.

During the year 2016, the total revenue collected in this activity was Rs. 7,542,500.00.

Product assessment and registration of new molecules

Safer and environmental friendly pesticides were identified and promoted during the pre-evaluation of products for local trials, which facilitate the phase-out of hazardous products available in the market. Seven (7) pesticide formulations were evaluated during the year and three (3) products complied for stringent evaluation criteria for registration (Table 2.1.3.3).

Table 2.1.3.3: The overall status of the evaluation of pesticides for registration during the year 2016

Category	Status of registration	Number
New pesticides	Evaluations completed	07
	Registration granted	03
Conventional pesticides	Evaluations completed	49
	Registration granted	49

The following new molecules of pesticides were assessed for registration for agricultural applications: Imazethapyr 10% SC, Triafamone 20% SC, Nicosulfuron 4% SC, Fenpyroximate 5% EC & Bistrifluron 10% EC. Four of the above molecules were low-risk pesticides belonging to the World Health Organization (WHO) Hazard Class III or below. However, Fenpyroximate 5% EC required a special justification for registration since it belongs to the WHO Hazard Class II. Based on the justification given by the Coordinator/ Entomology Working Group, the registration was granted for Fenpyroximate 5% EC for use on mites in rice; the justification was based on the control of panicle (sheath) mites in rice and it was reported that at present Profenophos (belongs to organophosphate group, WHO Hazard Class II) is being tentatively recommended for mites in rice while the other miticides available in the market are Sulphur 80 WP and Abamectin 1.8 EC; by comparing all four pesticides in consideration of the Environmental Impact Quotient (EIQ) values, Fenpyroxymate 5% EC was recommended as the safest pesticide for the control of panicle (sheath) mites in rice cultivation.

Coordination with other institutions in registration matters

Pre-evaluation of pesticides is a critical step towards sustenance of pesticide management in Sri Lanka. The technical sub-committees on different product categories viz. agricultural, public health and industrial pesticides serve as the preliminary screening and approval mechanism for candidate pesticides. The sub-committees are established under the authority provided by section 5(1) b of the Control of Pesticides Act No. 33 of 1980 (as amended by the Acts of No. 06 of 1994 & No. 31 of 2011). In order to streamline smooth functioning of

the activities in the sub-committee, the clear mandates on Terms of Reference (TOR) & General Rules of the Meetings were prepared & re-adopted at meetings held in November 2016. The sub-committees are mandated to hold three to four meetings per year. However, depending on the periodic requests & issues, the Agricultural Pesticides Sub-committee (APeSC) held its 20th to 23rd meetings, while the Public Health Pesticides Sub-committee (PHPeSC) held its 11th – 12th meetings and the Industrial Pesticides Sub-committee (IPeSC) held its 7th meeting during the year 2016.

During the year, relevant technical sub-committees were directed to screen 147 candidate pesticide applications. Thirty nine (39) applications were rejected at the preliminary screening stage by technical sub-committees: three on unacceptable health hazards (e.g. high bee toxicity; twenty one on less priority grounds due to availability of adequate alternatives etc.; three on unacceptable health risks (e.g. high acute hazard in Class II etc.); and twelve on lack of complete data for review.

The intensive use of sulfonyl urea herbicides has shown some indication on possible resistance emergence among some of the weed spectra in rice fields. Based on farmer complaints on sulfonyl urea herbicides, for inefficient weed control in rice fields, which led the Office of the Registrar of Pesticides to request from the Research & Extension divisions of the Department of Agriculture (DOA) and from the pesticide industry to look for reforms for resistance management, including actions such as use restrictions and regional recommendations. Since the initial trials were not accepted by the APeSC due to procedural lapses, further collaborative assessment covering the whole spectrum of sulfonyl urea herbicides were proposed for the 2016/2017 Maha season though the Research & Extension divisions of the DOA, in order to resolve weed management issues on sulfonyl urea herbicides.

Another salient feature in the management of pesticides is the denial of overdosed pesticide-treated articles for household use; for example, proposals for introducing Insecticide-treated Long Lasting Mosquito Nets (LLMN) containing higher concentrations of synthetic pyrethroids than the WHO recommended doses would create unnecessary public exposure and emergence of resistant mosquito populations. Therefore, the PHPeSC denied two applications on the above technical grounds.

Preliminary review of indigenous bio-pesticides for registration in Sri Lanka

Along with the government policy to promote safe initiatives in agricultural production, there are entrepreneurial motives to introduce biological pesticides in the country. In this effect, draft proposals were developed by a team of experts on the requirement for registration of biological pesticides on different origins. The draft proposals were further discussed at the Consultative Workshop on Registration of Bio-pesticides in Sri Lanka and Review of Relevant Guidelines held on 28th October, 2016 at the Ministry of Agriculture (MOA). Accordingly, on the advice and on behalf of the Director General of Agriculture, a committee was set up to review of preliminary data submitted for local/indigenous bio-pesticides with the

intention that "upon bio-efficacy evaluations are conducted at a government research institution satisfactorily and in parallel, the chemical composition is analysed, known & justifiable, a provisional registration can be granted pending submission specifically mentioned other data requirements for registration under the Control of Pesticides Act No. 33 of 1980". The preliminary data packages consisting of botanicals (plant extracts) & bio-control organisms were screened and prioritized the products for local testing and further chemical verifications being high priority areas under the present circumstances.

Removal of high risk pesticides

As per the decision taken at the 81st Pesticides Technical & Advisory Committee (PeTAC) meeting held on 28th September, 2016, the ROP was authorized to implement import restrictions on Diazinon, with an annual quota of 25% depreciation from January 2017 through December 2019. Accordingly, the maximum annual quotas of technical and formulated Diazinon (50%) were decided for individual registrants based on average volumes imported to Sri Lanka during the 2014-2016 by respective registrants. The decision was based on the listing of Diazinon under the International Agency for Research on Cancer (IARC) 2A category (Probably carcinogenic to humans on mechanistic evidence) and in tandem with the pesticide safety initiatives to the general public. The PeTAC considered that there are sufficient numbers of insecticide alternatives on key pests in recommendation and any loss of opportunity can be supplanted by recommending reduced-risk pesticides on any key/minor pests during the phase-out period.

In addition, the PeTAC granted approval in October 2016 for banning of Chlorpyrifos, Carbofuran and Carbaryl in a form of formal declaration in the government Gazette Extraordinary, as they are highly toxic and high volumes had been used in the past. The regulation was published in the Government Gazette Extraordinary No. 1999/33 dated 28.12.2016.

Management of high risk pesticides

Restricted use of Krismat 75% WG (a product containing 73.1% of Ametryn + 1.8% of Trifloxysulfuron Sodium Reg. No. M710000)

In August 2016, actions were taken to introduce unprecedented proposal to initiate a new culture of use of high risk pesticides in Sri Lanka by introducing a "prescription-based" sale and distribution based on Krismat 75% WG . In order to qualify for this initiative, the Office of the Registrar of Pesticides proposed some preparatory tools as follows:

1. List of potential users (Name, Complete Address and ID Number) certified by the certifying crop research institution.
2. An ID format (to be issued for purchasing of the product from certified sales outlets, which will be signed by the Registrar of Pesticides)
3. List of dealers and distribution points (Name, Complete Address, Contact Number etc.)
4. Record format for the dealer for record keeping while on sale/issue

This initiative was taken in support of registration of Krismat 75% WG by considering its WHO Hazard Class II for

exclusive use in sugarcane cultivations in Sri Lanka.

Freeze of Marshall 20 SC (Carbosulfan 20% SC) Imports at 155 Kiloliters per Annum

In order to complement with safe use initiatives on pesticides in the country, the Office of the Registrar of Pesticides declared its interim decision for maximum volume of imports at 155 kiloliters per annum (from January 01st to December 31st) for Carbosulfan 20% SC. The decision to freeze at the above level was based on the average volumes imported to the country within past two years (2014 - 2015), without taking into consideration the withdrawal of whitefly from existing recommendations since March 2016.

Suspension of Glufosinate Ammonium

Glufosinate Ammonium 150 g/L SL (Basta®) has been recommended in tea & sugarcane as a non-selective, contact, post-emergent herbicide since 1994. Basta® has been classified under the WHO Hazard Class II (which is the highest hazardous classification amongst existing over-the-counter pesticides), and shown to be having significant dermal/ eye irritation potential for the applicator. Due to its inherent toxicity potential and extensive use in the field has led to trending misuse such as intentional suicides. As an institution entrusted with far-sighted responsibility on averting any overly misuse potential by the community in this country, the use of Basta® were proposed to be restricted for tea and sugarcane sector, where there are control over safe and effective use by necessary supervision. The PeTAC at its 76th meeting had formerly accepted the policy against liberal use over Basta®. However, by July 2016 two Glufosinate Ammonium products including hitherto registered Glufosinate Ammonium 280 g/L SL (Lifeline® Glufosinate Ammonium) were cancelled on specific directives given by the President Secretariat, pending a justification for declaring Glufosinate Ammonium in a Government Gazette Extraordinary as a banned pesticide.

Prohibition of Propanil-based Pesticides in Restricted Areas as per the Government Gazette Extraordinary No. 1894/4 dated 22.12.2014

In consequent to the regulations made by the Government Gazette Extraordinary No. 1894/4 dated 22.12.2014 to prohibit the use, offer for sale or sale of Propanil within the districts of Anuradhapura, Polonnaruwa, Kurunegala, Moneragala and within the Divisional Secretariat Divisions of Mahiyanganaya, Rideemaliyadde, Kandeketiya in the Badulla district, the pesticide industry was instructed to take strategic actions to maintain the above restrictions in the declared regions of the country. In consequent to this regulation, the PeTAC at its 77th meeting held on 02.10.2015 decided to liberalize Propanil-based mixture herbicides to be imported & used in the country, as there were no effective alternatives in rice weed control and some of the herbicides (e.g., sulfonyl ureas) were suspended very recently due to poor efficacy reasons. Therefore, the above decision did not revoke the above regulation with respect to Propanil (as an active ingredient). Therefore, strict distribution advisories were issued to the pesticide industry to instruct their direct and indirect dealership to refrain from issuing unjustifiable quantities of Propanil-based

mixtures to clientele within the free-sale areas of the country, and maintain records of bulk sale (e.g. >2 hectare requirements) at the dealer/sub-dealer with details of the purchaser.

However, PeTAC emphasized the practical difficulty of implementing the prohibition of Propanil mixtures in the restricted areas as there are few other herbicides available as alternatives. On the advice of the PeTAC, the ROP declared applicable quotas for Propanil-based herbicides among three registrants, based on the total rice extent in the non-restricted regions of the country.

Amendments to the Labels- Diuron 80% (w/w) WP & Diuron 50% (w/v) SC

Consequent to the banning of some of the total herbicides (viz., Glyphosate and Glufosinate Ammonium), there is tendency for using Diuron products in sensitive cultivations such as rice fields, and the situation could be aggravated further if Diuron product were used on lands just before intercropping. Misuse of existing herbicides in Sri Lanka could lead to adverse effects in future. Therefore, in order to overcome this issue, Advisory Circulars were issued in August 2016 to all field Authorized Officers and the Pesticide Industry. In addition, necessary awareness materials in all 3 languages were approved for distribution through respective registrants to accompany Diuron products (Diuron 80% (w/w) WP & Diuron 50% (w/v) SC) until new label amendments are done.

Phasing out strategy on Technical Malathion in Public Health Sector

The 81st meeting of the PeTAC held on 28th September, 2016 proposed to review of the use of Malathion in consultation with the Ministry of Health. During the review it is expected to consider available alternatives and the cost factor as "good" aspects against the risk of impurities (e.g. *iso*-malathion), the by-product of Malathion, which is more toxic than the mother molecule, as "bad" aspects. Further, the decision on this review was based on the listing of Malathion under IARC 2A category (Probably carcinogenic to humans on mechanistic evidence) and in tandem with the pesticide safety initiatives to the general public.

On September 5, 2016, Sri Lanka was declared malaria-free at the 69th Session of the WHO Regional Committee for South-East Asia held in Colombo. This is another milestone in Sri Lanka's outstanding achievements in public health safety, and partly corroborated to the actions on insecticide regulations in Sri Lanka under the Control of Pesticides Act No. 33 of 1980 by facilitating variety of control measures such as insecticide-impregnated bed nets, mosquito adulticides, larvaecides & repellents in a multi-pronged attack on malaria vectors.

Re-registration of pesticides

The registration of a product is valid only for 3 years after which the product status is reassessed for new scientific and regulatory standards. During the year, 74 applications were processed under this category. Under this scheme, product safety, quality and the performance will be assessed from freshly generated toxicity and product quality tests from most authoritative sources (e.g. Good Laboratory Practices complied & accredited laboratories). Currently, there are over 647 pesticide products handled in general (mostly agricultural pesticides), domestic and restricted categories, and the overall chronology of

regulatory actions were supplemental to become pesticide use increasingly safer each year. Total revenue realized under this category was Rs. 416,000.00.

Registration of pesticide establishments

All pesticide companies are required to be registered with the ROP with the intention that all functions associated with pesticide business are critically evaluated in a competent manner to safeguard human health, environment and wildlife resources as pursuant to the Sections 5 (a) and 5 (b) of the Government Gazette Extraordinary No.1870/63 dated 10.07.2014.

The aforementioned regulation directly affect 76 major pesticide importers (including indenting businesses), who have divergent interests such as importation, formulation, packing, re-packing, labeling, distribution, storage & transport. Accordingly, the regulation required to evaluate all prospective trade links and partnerships of pesticide life-cycle activities in the country including the store up & use of pesticides (in bulk) for necessary compliance with any applicable national law(s) of the country with respect to the environment, public and worker health safety, and the requirements of local government authorities and others. During the year 2016, all establishment profiles were thoroughly reviewed for competency certification. The major outcome of this exercise was that the entire Pesticide Industry is shown mandatory accomplishments in ISO 9001 (quality), 14001 (environment) & 18001 (health), and other accomplishments for environmental protection goals as set out under the National Environment Act No. 47 of 1980, depending on the nature of business.

During the year, the revenue realized under this category was Rs. 600,000.00.

Pesticide dealer empowerment

As an ongoing program, the Office of the Registrar of Pesticides continued to co-ordinate with the Provincial, Inter-provincial and Mahaweli Authority staff to implement the pesticide dealer certification & licensing scheme. During the year, 16 pesticide dealer training programs were conducted for 656 participants as a bridging program before hand to train pesticide dealers up to the National Vocational Qualification (NVQ) level IV competency certifications as per the regulations imposed under the Control of Pesticides (Sales and Supply) No. 01 of 1999 (Government Gazette Extraordinary 1716/23 of 27.07.2011).

Pesticide dealer licenses are valid for one year unless cancelled for specific reasons. A fee of Rs. 550.00 is charged as a part of the regulatory requirements for issuing a license. Total revenue realized under this category was Rs. 803,550.00. The number of dealer shops licensed was 1,461.

Import approvals

Importation of pesticides in the country is subjected to regulation by the Section 17 of the Control of Pesticides Act No. 33 of 1980. The ROP issues import approvals for pesticides upon receipt of requests from the companies on consignment basis, and the period of validity would be limited to 3 months from the date of its issue. A considerable effort and time is required to undertake such requests. This process ensures that products are imported from the correct source of supply conforming to the required quality standards and prevents

importing excess volumes. During the year, 282 quality certificates submitted by the importers were assessed for this purpose prior to issue of import approvals. Meanwhile, 475 samples were cross-screened as a mean of compliance verification for the FAO quality standards before issuing of packing clearance on consignment basis.

Screening of labels and advertising materials

Label approval procedure enabling dissemination of proper information to the end user has been a recurrent activity. Approximately 1,750 labels and over 143 advertising materials (leaflets, posters, banners and danglers, etc.) were screened during the year 2016. There were complaints promoting considerable outdated material and/or information on pesticides in the field, which prompted to introduce and maintain a special coding system on every printed advertising material in order to verify the status of contemporary approval by the ROP.

Actions against unethical pesticide promotions

Although a significant compliance over unethical and unapproved advertising on pesticides were maintained by pesticide companies including the house-hold sector during the year, in few instances, there were abrupt occurrences of marketing of multiple packs composited in a single-labeled pack (e.g., 5 x 100 g in 500 g packs of powder formulations of Diuron) by a leading company and in another instance, there were promotions on in-tank mixtures of two herbicides (as pre-land preparation total herbicides), which are strictly prohibited. The complaints were immediately addressed and errors were rectified. Since label recommendations and licensing conditions are specifically stated during the pesticide registration process, any impending violations will be rectified & necessary corrective actions will be taken for consumer protection.

Training and awareness programs

For the year 2016, Rs. 2.0 million was granted through the National Food Production (NFP) Program (2016-2018) of the MOA for the continuation of training of Agrochemical Sales and Technical Assistants (ASTA) in collaboration with the National Apprentice and Industrial Training Authority (NAITA). 466 new applicants were selected for continuation trainings by the regional officials of the DOA & NAITA covering the districts of Anuradhapura, Nuwara Eliya, Hambanthota, Polonnaruwa, Kalutara, Kurunegala & Matale during the year 2016. As of October, 2016 new training programs were started in Kandy & Ampara districts while several other districts viz., Colombo, Batticaloa, Trincomalee, Puttalam, Moneragala and Badulla were instrumental in selection of candidates. It is evident from the past that the success of the training was some of the districts were at its 3rd round (e.g., Anuradhapura & Polonnaruwa) while the districts of Badulla, Hambanthota, & Matale were at its 2nd round.

The necessary pre-requisites including the preparation of national competency standards (Code: D24S001) and competency-based assessment resources (Code: A01S001) were validated by NAITA and endorsed by the Tertiary & Vocational Education Commission (TVEC). It is expected that all the certified

ASTA personnel will be eligible for the NVQ Level IV competency certificates upon completion of the formal competency requirements including curriculum development by University of Vocational Technology (UniVOTEC) and accredited by the TVEC within 2 years. This is a recurrent program.

Quality control of pesticides

Quality control of pesticides is one of the major undertakings at the analytical laboratory of the Office of the Registrar of Pesticides. It has been functioning for compliance monitoring purposes with the existing capacity, which is being upgraded for service-oriented activities upon receiving the status of laboratory accreditation ISO/IEC 17025: 2005, hopefully within the first quarter of 2017 (see actions under Special Activities). The analytical laboratory of the Office of the Registrar of Pesticides is in the possession of most sophisticated equipment in analytical caliber such as Gas Chromatograph-Mass Spectrometry (GC-MS), Inductively-Coupled Plasma Spectrophotometer (ICP-MS), Gas Chromatograph (GC) & High Performance Liquid Chromatography (HPLC) for qualitative and quantitative testing of pesticides, food & environmental samples.

Due to the overwhelming cost incurred on analytical work, the sustainability of the functions are always hampered by limited budgetary allocations to the Office of the Registrar of Pesticides, and therefore, imposing a levy on services given to the industry on item wise would be the best solution. As per the provisions under the Section 23 (2) of the Control of Pesticides Act No. 33 of 1980, a levy on the importer, manufacturer, formulator or packer of a pesticide can be imposed for the general purpose of making proper financial provision for the effective implementation of this Act and of the regulations made there under. As per the above initiative and with the available provisions of the Act, the ROP requested services for assessing the cost of analysis for the entire spectrum of services currently undertaken at the analytical laboratory, in July 2016. Through open bidding procedures, M/s SGS Laboratory Services (Pvt.) Limited was selected for providing services. They undertook preliminary auditing for estimating the cost of analysis for the entire scope, in December 2016.

During the year 2016, 475 pesticide formulations (i.e. production batches) were analyzed for quality and performance parameters and 397 production batches were confirmed valid on quality grounds (based on physico-chemical parameters in the FAO specifications and own quality certificates) & approved for marketing. Meanwhile, one (1) pesticide consignment was re-shipped to the manufacturer on the failure of quality standards.

The analytical laboratory of the Office of the Registrar of Pesticides undertook testing for toxic heavy metal contamination levels in some popular & generic synthetic pesticides in comparison with herbicides of plant extracts by using the ICP-MS. Although the results cannot be generalized, the data showed some of the popular misconceptions that “organic” pesticides are benign and synthetic pesticides are “harmful” in terms of hazardous impurities (Table 2.1.3.3). The following Limits of Detection (LOD) values were valid for the most recent assessment of heavy metals in the

laboratory of the Office of the Registrar of Pesticides: As, 0.003 ppm; Se, 0.076 ppm; Cd, 0.002 ppm; Hg, 0.004 ppm; Pb, 0.001 ppm.

Table 2.1.3.3: Toxic heavy metal contaminants in selected pesticides (ppm)

Product	Arsenic (As)	Selenium (Se)	Cadmium (Cd)	Mercury (Hg)	Lead (Pb)
Q-Star ®	0.019	<0.076	0.0985	0.0965	<0.0823
Beloukha WH®	0.0165	0.080	0.085	0.037	0.196
Nominee®	0.043	0.0827	0.0095	0.0212	<0.0823
BPMC	0.0675	<0.076	0.0097	<0.0133	0.194
Profenophos	0.0326	<0.076	0.0097	0.048	0.2047
Quinalphos	0.135	0.1105	0.0052	0.017	0.092

Establishment of four Technical Management Divisions

As a part of efficient management of regulatory activities, and in parallel to the preparation of a project proposal to restructure the present system of pesticides regulation in the country to cater to the global developments and to address human and environmental health issues as a one-stop-shop for pesticide-related matters, the following management divisions were established in the Office of the Registrar of Pesticides. Below is a summary of divisions & their responsibilities.

(a) *Pesticide Registration & Import Control Division I*: Product registrations, re-registrations, import & experimental use permits, of agricultural pesticides.

(b) *Pesticide Registration & Import Control Division II*: Product registrations, re-registrations, import & experimental use permits, of domestic & industrial pesticides.

(c) *Field Monitoring & Legal Support Division*: Training & awareness activities, field complaint handling & legal support, Pesticide dealer training & certification, pest control service certification & monitoring.

(d) *Compliance Monitoring and Safety Division*: Pesticide product quality testing, residue analysis and laboratory training etc.

In order to be excellent in services for local and international standards, a proposal for 424 million was presented to the Government in November 2016 with a view to construct a new building/office complex for the Office of the Registrar of Pesticides & to establish a pesticide analytical laboratory at the entry point, at Colombo harbor premises. Supply of necessary equipment & human resource developments are further activities proposed under the above proposal. It is absolutely essential that the Office of the Registrar of Pesticides be restructured and provided with improved physical and human resources to tackle pesticide-related issues in the country, holistically.

SPECIAL ACTIVITIES

Upliftment of laboratory proficiency up to the international standards

Assisted with the technical & instrumental capacity development under the special project on technical collaborative grant aid under the

TCP/SRL/3402 by Food and Agriculture Organization, FAO (through Asia-Pacific Regional Center in Bangkok) to improve "Management of Risks Associated with Pesticides Used in Agriculture in Sri Lanka" through the MOA (Ref. Performance Report 2015), the analytical laboratory of the Office of the Registrar of Pesticides has gained its proficiency caliber for (a) pesticide residue analysis in water, (b) heavy metal analysis in pesticides/ food items and (c) physical and chemical testing of pesticide formulations for common parameters as set out in the FAO specifications on plant protection products with a limited stipulated parameters and/or scope.

As a candidate client in international accreditation ISO/IEC 17025: 2005, the maintenance of track records in proficiency in testing has always been a high priority. The FAPAS® Proficiency Test is such a program to measure the ability to report results in the specified units and within the given time scale are part of the proficiency test. The inter-laboratory analysis under the FAPAS® Proficiency Test 07251 on vegetable puree sample was in compliance with Cadmium (Cd) while FAPAS® Proficiency Test 07248 on soya flour was in compliance with Arsenic (As) and Mercury (Hg) elements. The analytical laboratory of the Office of the Registrar of Pesticides also participated in the FAPAS® Proficiency Test 19205b pea pod sample pesticides residue analysis & shown its international competency.

Training workshop for fellow investigators on other Acts & other officers

During the year 2016, there were 6 training classes held for 210 participants of Public Health Inspectors (PHI) from the Department of Health. It is hoped that they will be functioning as facilitators for prosecution for illegal activities under the Control of Pesticides Act No. 33 of 1980 as "Enforcement Officers" (i.e., persons empowered to institute proceedings and conduct prosecutions). The Section 24(A) of the Control of Pesticides (Amendment) Act No. 06 of 1994 has been crafted in such a manner to exploit external resources for legal actions, nominated as persons empowered to institute proceedings and conduct prosecutions. The Office of the Registrar of Pesticides will embark on recruiting external Officers for field monitoring of pesticides during the year 2017.

Implementation of Empty Pesticide Container Management in Sri Lanka

The Office of the Registrar of Pesticides in collaboration with the Ministry of Mahaweli Development & Environment (MMDE) has initiated a program to develop strategies to manage empty pesticide containers in the country. There are two pertinent sources of containers viz. by company disposals of large drums and smaller containers disposed at farmer fields. It is estimated that yearly turnover of empty glass containers only is nearly 1,000 tons at a worth of Rs. 38 million. It has been estimated that 14.6 million pesticide containers (which includes all types of containers as of 2011) are disposed of

haphazardly every year into the environment without a proper management option.

In the light of the above, it was proposed that the problem of empty pesticide containers would need a proper solution through a well supervised recycling mechanism under controlled conditions in line with the waste management hierarchy. After successful discussions during stakeholder meetings on strategies to implement the program, all agreed on (a) the necessity of a solution for container disposal, (b) social responsibility of all parties concerned and (c) to explore technical feasibilities for recycling of glass and plastic containers in the country. This is a part of the theme under the Basel Convention to implement strategies to minimize health and environmental implications from empty pesticide containers at the field level.

The recycling of glass and plastic containers is a well established private enterprise in the country, which is regulated by the Central Environment Authority (CEA). Currently, there are several projects executed by the CEA to strengthen waste management systems within the industry under the premise of "public-private partnership" programs. By considering the unique & hazardous nature of wastes, it was proposed to develop an exclusive mechanism for private organizations including the Crop Life, Sri Lanka (which is the pesticide industry coalition in Sri Lanka) for collection, processing and manufacturing of non-consumable items.

The proposed empty pesticide container management program was expected to obtain the fullest implementation support of the CEA. On 22nd August 2016, the above initiative was officially launched with the participation of Secretaries/ representatives of Secretaries to the MOA & the MMDE, Durector General of Agriculture and other stakeholders & signed a memorandum of understanding (MOU) among key stakeholders. In order to mark the shared responsibility, the Office of the Registrar of Pesticides distributed two plastic waste crusher machines to deploy at pilot projects on waste recycling through the CEA. Also, four regional container collection centers were built and declared open during the 'Govi sathiya' from 8-15 October, 2016. These centers will be functioning as the link between the farmer (at the field level) and the recycler. Field collection mechanism will be implemented by the Crop Life, Sri Lanka (company association with the membership of 29 pesticide companies in Sri Lanka, as of December 2016). The regional container collection centers are located at (i) Seetha Eliya Government Seed Farm, (ii) Polonnaruwa Government Seed Farm, (iii) Pelwehera Government Seed Farm, and (iv) Regional Agricultural Research & Development Institute, Makandura (NW).

The following recyclers are enrolled in the approved mechanism to accept "triple-rinsed" glass and plastic (HDPE) empty pesticide containers: (1) M/s Polykar PVC (Pvt.) Ltd., & (2) M/s Piramal Glass Company (Pvt.) Ltd.

The Office of the Registrar of Pesticides facilitated this program through financial provisions by purchasing 2 crusher machines (Rs. 1.43 Mn.), construction of 4 regional container collection centers (Rs. 3.7 Mn.), printing of stickers for field collection bins (Rs. 0.49 Mn.) & poster/ leaflets for farmer awareness (Rs. 0.43 Mn.), at a total cost of nearly Rs. 5.7 million.

The Office of the Registrar of Pesticides has also taken initiatives to popularize the concept of "bio-beds" among farming communities to avert injudicious disposal of pesticide wastes and empty containers in to the environment. The "bio-bed" concept which has been implemented by many European farms uses microorganisms naturally present in organic media to detoxify pesticide wastes. It is expected to collect old soiled-containers unattended in the field and in house-holds and to direct them to the regional field collection and recycling, after thorough cleaning on "bio-beds".

The segregation and collection of pesticide containers at the field level were facilitated by raising farmer awareness through field extension staff. For this purpose, the Office of the Registrar of Pesticides created and funded for distribution of 400,000 posters on 4 thematic designs both Sinhala & Tamil languages; 300,000 technical advisory leaflets on 3 thematic designs in both Sinhala & Tamil languages, among farmers & extension officers.

National Food Production (NFP) Program 2016-2018: Food Safety Assurance

As public and international demand for safe food free from harmful levels of pesticide residues has been heightened, though quite belatedly, work continues to secure national and international commitments to manage pesticide residues to acceptable levels. Currently, pesticide residues on fruits and vegetables is a major concern due to not following Good Agricultural Practices (GAP) in agricultural production. Higher pesticide residue levels have been detected in exported consignments of vegetables and fruits to the European Union (EU), not complying with their standards. Hence, EU is in the process of continuous auditing of the existing implementation strategies in Sri Lanka on the same. However, information on pesticide residue analysis and detection in fresh food products in the country was limited. Therefore, there was an urgent need to establish a reliable database for pesticide residues on various agricultural products in local production channels.

A national residue data base

The NFP Program (2016-2018) implemented by the MOA gives priority & financial support to quality control of agricultural produce and implementation in terms of monitoring of pesticide residues according to local and international standards. In order to mark the commitment, the MOA has initially allocated Rs. 12.25 million for developing a National Pesticide Residue Database by targeting analysis of 500 food samples during 2016 (Rs. 7.25 million) & 2017 (Rs. 5 million) for major pesticides used in agriculture. The pesticide residue monitoring program will be operating from September 2016 through September 2017.

Agricultural product contamination with pesticides

The results of monitoring for major pesticides in 145 vegetable samples from the local market revealed that 63 samples had been tainted with pesticides but only one sample exceeded the proposed regulatory limits adopted from the CODEX Alimentarius Commission, CODEX (i.e., Crop: Bean, Violation: Tebuconazole

0.37 vs. 0.30 ppm). The results of a collaborative study (Senthuran et al., 2016. Assessment of pesticide residues in vegetables of selected domestic markets in Sri Lanka) on pesticide residue in 45 market-basket vegetable samples from Nuwara Eliya, Puttalam & Matale districts revealed detectable residue levels but none of the samples were exceeding regulatory limits of CODEX. Meanwhile, 28 vegetable samples taken from exporter pack houses were tested (during 07/2016) for major pesticides and 12 samples were found to be tainted (43%), and except 8 samples (28%), all the other sample contamination levels were below the EU MRLs of respective pesticides. Profenophos, Thiamethoxam, and Tebuconazole were among the detected out of 52 pesticide active ingredients including commonly used contemporary pesticides and several banned pesticides (Method Detection Limit, MDL =0.01 ppm), according to the scope of analysis at the Industrial Technology Institute; there were more frequent violations in leafy vegetables. However, the quite narrow scope of analysis hinders a meaningful decision on food safety with respect to pesticide residues. The EU MRLs are much more stringent, and it is only about 40% of the local MRLs adopted from the CODEX.

Meanwhile, 41 commercial rice samples (local, imported & some traditional varieties) were analysed in a collaborative study (Panapitiya et al., 2016, Levels of selected heavy metals in rice in Kandy district) and it was found that none of the rice samples were contaminated with toxic heavy metals (assessment included Pb, Cd, As, Hg & Se) exceeding the FAO/ WHO Tolerable Daily Intake Levels.

Scope of analysis

The laboratory of the Office of the Registrar of Pesticides is geared towards strengthening of laboratory standards to the international level, ISO/IEC 17025: 2005 accreditation with the focus on pesticide quality and residue assessments. The initial assessment has shown compliance on residue assessment on 5 active ingredients (i.e., Fipronil, Tebuconazole, Chlorpyriphos, Prothiophos and Diazinon) in water and agricultural produce but the laboratory is competent in analysis of 10 active ingredients. It is continuously being upgraded its testing requirements and analytical capabilities, with a practical target to increase the analytical scope up to 30 during the year 2017. For comprehensive assessment of agricultural products for pesticide residues, the whole analytical infrastructure in the country must meet to analyse over 107 active ingredients (used in agriculture as of December 2016) within the next couple of years.

Setting maximum residue limits

The Control of Pesticides Act No. 33 of 1980 (Section 26- Manner of the sale and use of pesticides) has set out ample provisions to declare safe limits for pesticide residues in local consumptions of fresh fruits and vegetables. In order to complement national food safety assurance, 221 pesticide tolerance limits (maximum residue limits, MRLs) on 39 crop/food categories for 65 active ingredients were finalized for the Government Gazette Extraordinary notification. The Law requires the Office of the Registrar of Pesticides to set MRLs for over 100 active ingredients to ensure food safety in the country. This assessment may require another step forward in preparation for analyzing foreign active

ingredients in order to complement total food safety by focusing imported agricultural products as well, within the next couple of years.

Acquisition of high-tech instruments for pesticide quality assurance

The policy of the formulation & residue laboratories is to maintain good professional practices meeting international standards of testing of pesticides with highest achievable accuracy and to provide traceable high quality services in conformity with the applicable requirements of ISO/IEC 17025: 2005 international standards. Therefore, the infrastructure development at the analytical laboratory of the Office of the Registrar of Pesticides was further upgraded by spending nearly Rs. 20 million through the NFP Program for acquiring ancillary equipment and laboratory chemicals. Out of which nearly Rs. 5 million was spent on acquiring a Fourier Transform Infrared (FTIR) Spectroscopy machine for solving analytical challenges with easy to achieve qualitative and quantitative analysis of a wide range of pesticide and non-pesticide (organic and inorganic) samples needing special identifications, such as adulteration during manufacturing and field activities.

Management plans for obsolete pesticides

As of December 2016, 26 metric tons of obsolete pesticides were accumulated in government farms and research institutions of the DOA, over the period of last 2–3 decades. The preliminary discussions prompted the Office of the Registrar of Pesticides to maintain a secure storage facility at the DOA, which was considered as the only feasible interim solution for the management of obsolete pesticides.

With the financial allocations through the Office of the Registrar of Pesticides, an existing building from the Field Crop Research and Development Institute (FCRDI), Mahailluppallama was completely renovated by June 2016, by taking into account the commonly acceptable standards of secure storage facilities for hazardous substances. During the initial trial storage, approximately 0.4 metric tons of obsolete pesticides were stored in a secure manner at the above facility and another 24 metric tons of obsolete stock at regional locations were inspected for verification purposes. Some of the stocks at regional centers (e.g. Deputy Director's Office at Ampara) were voluminous and badly decayed requiring great caution in handling. The Office of the Registrar of Pesticides noted that a separate secure storage facility is needed in order to manage some of the regional stocks of obsolete pesticides in possession with the DOA.

Legal prosecutions and ongoing proceedings against illegal pesticides

The Office of the Registrar of Pesticides has made some significant progress during the year 2016 on revealing illegal attempts to sell Glyphosate containing products after the cancellation of registration & stop-sale regulations (Government Gazette Extraordinary No. 1937/35 dated 23.10.2015) have been issued. In January 2016, a pesticide trader in Naula area was prosecuted for selling and/or offering for sale of Weedol® Glyphosate and a stock of illegal Malathion. In another incident, a pesticide seller in Siripura

area was found to sell Knockout® Glyphosate. In another attempt, an unscrupulous trader was caught while smuggling of D-Era® (containing 71% ammonium salt of Glyphosate) at the airport Customs. Necessary legal steps are being taken against the above violators.

Examples of significant enforcement actions on illegal pesticides over the past year include:

- In January 2016, a seller of illegal Glyphosate was confiscated at Naula area & summoned at the Naula Magistrate Court. The court proceedings are on-going.
- In December 2015, a main pesticide dealer at Wanathavilluwa, Puttalam area was found storing a large stock of counterfeit illegal pesticide of Finchem® Carbofuran. The same dealer was also found storing illegal Counter® Glyphosate. After several hearings at the Puttalam Magistrate Court, the case was disqualified due to procedural lapses, but as a result of appeal by the ROP in October 2016, and on the advice of the Attorney General's Department, the case is being processed at the Puttalam High Court. The court proceedings are on-going.

Audit on laboratory compliance

During November 14-15, 2016, the analytical laboratory of Office of the Registrar of Pesticides had successfully undergone a 2-day peer evaluation by the joint peer evaluation team of Sri Lanka Accreditation Board (SLAB). The peer evaluation team consisted of 5 peer evaluators. They conducted a thorough, deep, detailed and strict assessment on SLAB accreditation programs for conformity assessment under ISO/IEC 17025: 2005, 41-5.10 quality management systems. During the evaluation, more than 25 accreditation files were checked by the peer evaluators. They had also checked corrective actions over pre-assessment requirements proposed on 14.03.2016. In addition, the peer evaluation team had witnessed 4 on-site assessments performed on heavy metal & residue analysis, wettability tests conducted by the laboratory staff. They concluded that the laboratory performance is satisfactory with little non-compliance for corrective actions before granting recommendations for international accreditation.

Pre-audit mission to Sri Lanka by the EU

In preparation for the EU audit on pesticide management in support of assurance of pesticide residues in compliance to the EU MRLs in exported agricultural products to the EU member countries from Sri Lanka, the STDF project under the ITC financially supported the mobilization of two EU Experts on agronomy (Mr. Manel Orpella from Spain) and chemical testing (Mr. Benoit Glaud from Spain) aspects during 22-29 June, 2016. During the 8-day mission, the experts were instrumental in heightening awareness through training workshops on the EU food control systems and its challenges, pesticide control, procedures of the marketing and use of pesticides, the EU requirements for laboratory analysis and related control systems in tandem with field visits. Many diverse groups of trainees including policy makers from stakeholder organizations, agricultural product exporters, researchers, extension and

laboratory staff of the DOA participated at the workshops.

The Audit to Sri Lanka to evaluate control of pesticides in food of plant origin intended for Export to the EU

Since there were number of interceptions from the EU in the recent past on exceed of MRLs on farm produce exported to the EU member countries from Sri Lanka, a 3-member team from the European Commission, two auditors from the Directorate General for Health and Food Safety and one expert from a European Union (EU) member state, visited Sri Lanka from 14-22 September 2016, in order to evaluate country's preparedness for future improvements needed to prevent violations. The entire assessment composed of the assessment to control mechanisms of pesticides in food of plant origin intended for export to the European Union from Sri Lanka.

The Office of the Registrar of Pesticides prepared an action plan under the guidance of the Director General of Agriculture in preparation for the Audit and to make the activities sustainable as the competent authority. The response of the ROP (as the competent authority of Sri Lanka) to the recommendations in the Report Ref. DG (SANTE)/2016-8787-MR on the Audit was submitted on 18 October, 2016.

Recommending Suitable Reduced Risk Pesticides for Leafy Vegetables with Short Pre-Harvest Intervals

According to the recommendations given by the EU Audit Report, it has been persistently stressed recommending specific recommendations for leafy vegetables including Pennywort (Gotukola - *Centella asiatica*). Most of the Pennywort cultivators are used to apply pesticides like Acephate, Carbosulfan, Profenofos, Tebuconazole, Thiamethoxam etc. As some of the pesticides (e.g. Profenofos) are banned in EU countries, the above Audit has raised negative impressions in this regard. It is imperative that export products to the EU market must comply with most stringent Maximum Residue Limits (MRLs), where in most cases the EU banned compounds are set at a default MRL at 0.01 ppm. Other than that, if in cases our farmers were used to apply the EU-authorized pesticides for leafy vegetables, we may need to pay special attention on application rates & frequency of application etc. to meet most stringent EU MRLs compared to CODEX MRLs. Discussions were had on 18 November 2016 at the APeSC to propose recommendations to meet the above task with utmost priority in order to protect the export market of the Fruits and Vegetables from Sri Lanka.

Implementation of Exporter Registration Scheme under EU Audit to Evaluate Control of Pesticides in Food of Plant Origin Intended for Export to the European Union

Registering of the exporters who send their Fresh Fruits and Vegetables (including leafy-vegetables) to the EU market is one of the main activities identified by the EU Audit team during 14-22 September, 2016 (Ref. DG (SANTE)/2016-8787-MR). The exporter registration process was proposed with the anticipation of full implementation by 15

September 2016. The Agri-Business Council of the Department of Agriculture (ABC-DOA) was proposed as the Registration Focal Point for EU Exporters & necessary applications were designed by the ROP. Accordingly, six potential exporters of Fresh Fruits and Vegetables (including leafy-vegetables) to the EU have been registered under the scheme through the Agri-Business Council, as of December 2016.

At this very critical stage of implementation of the EU Export Requirements for Pesticide Residues in Food of Plant Origin from Sri Lanka, and having close scrutiny of Production and Processing of Fresh Fruits and Vegetables (including leafy-vegetables) through Counselors of Agri-Business (CAB) of the DOA, necessary initiatives were taken by the Office of the Registrar of Pesticides through the Director General of Agriculture to restrict all exports of Fresh Fruits and Vegetables (including leafy-vegetables) to the EU member States through registered parties by November 2016. Accordingly, the current Directive will be serving as an immediate and short-term strategy in order to prevent tarnishing EU Export Hub of Fresh Produce (Fresh Fruits and Vegetables, including leafy-vegetables) from Sri Lanka with unauthorized pesticide residues. The Office of the Registrar of Pesticides is working with the CAB Officers of the DOA to establish a "direct farmer & exporter link" to ensure that pesticide residue limits are not violated at the EU entry point.

Implementation of the use of safety kits for pesticide application

The ROP sent a Circular No. PPE/Saf/04/2016 dated 25.04.2016 on popularizing of safety kits among farmers and this novel initiative will be compulsorily implemented with effect from January 31st 2017. Under this initiative, the ROP requested that complete Personnel Protective Equipment (PPEs) are available at the market place at a reasonable price in compliance to the existing regulations made under the Control of Pesticides Act No. 33 of 1980.

It is acknowledged here that the "International Code of Conduct on the Distribution and use of Pesticides" under the Article 5 to state that for Reducing Health & Environmental Risks, Government & Pesticide Industry should cooperate in further reducing risks by promoting the use of proper & affordable PPEs. Alternatively, there are regulations published under the Control of Pesticides Act No. 33 of 1980 to promote farmer use of PPEs by the Government Gazette Extraordinary No.1113/5 dated 05.01.2000 *Vide* Regulation 6 (b) that "every person who sells or offer for sale any general or restricted pesticides shall sell or offer for sale all protective clothing which may become necessary in the application of pesticides in order to ensure the safe use of such general or restricted pesticides".

The use of PPEs during application of plant protection products including pesticides by the local farmers are expressively meager resulting in danger to human lives. While chemical pesticides have contributed greatly to the increase of yields in agriculture by controlling pests and diseases, and towards the control of some vector-borne diseases in the human health sector, their continued & irresponsible use has surfaced many problems. According to a recent collaborative study (K.G.A.P.

Dulanjalee, Uva Wellassa University, Badulla. Impact of Pesticide Use Practices on Farmer's Health: A Case Study in Wijayagama and Eheranda in Matale District). conducted in rural farming villages in Matale district, it has been revealed that the type of pesticide, the dosage of pesticide, hours of exposure, number of bad practices and awareness on re-entry period were the significant factors affecting severity level of impact on farmers' health due to pesticide use practices. A majority of farmers (55%) used pesticides above the recommended doses. It was only 11% of the farmers qualified under "good" category in use of PPEs. Almost 75% of the farmers were used to throwing away empty pesticide containers as their preferred disposal option. Only 24% of farmers had a slight awareness on re-entry period and the rest of 76% was not aware about it. Only 16% of the total sample was not affected with discernible acute effects while 84% of the sample was reported to having one or more considered acute pesticide poisoning symptoms, after routine application of pesticides. The study documented a serious consequence of the indiscriminate use of pesticides for the farmers' health. This study gave indications that a majority of farm households do not take cognizance of the long-term and short-term health hazards of occupational exposure and acute pesticide poisoning symptoms are under-reported.

The Office of the Registrar of Pesticides envisaged that despite clear & concise recommendations and directives given in the past, there is a serious lacuna on implementation and compliance aspects, and availability of suitable PPEs in the market place is almost non-existent for decades. The standard PPEs include: protective eye wear, nose guard, face mask, long sleeved vest + longs or overall, hand gloves, boots, etc. Therefore, it is high time to design effective and targeted outreach programs which deal specifically with pesticide risk, safe handling and averting behavior.

The matter has embarked needing expeditious attention of the pesticide industry on this requirement. The Office of the Registrar of Pesticides has determined to make it a deliberate responsibility of the pesticide industry to create the availability of suitable PPEs in the market place, especially in all pesticide dealer outlets island wide. Individual proposals were sought from individual pesticide industries on avenues for making availability of PPEs suitable & affordable to the farmer, and in the meantime, take appropriate actions to make the farmers aware about the importance of using PPEs, through their field staff (i.e. to conduct demonstrations as many as possible) by 01st August 2016. The pesticide industry is being attending for fulfilling the requirements under their stewardship initiatives.

Chemical Policy Coordination & International Participation

Sri Lanka is a party under the Basel, Rotterdam, Stockholm & Minamata Conventions. The ROP has been functioning as the Designated National Authority (DNA) on powers vested with regulation & control of pesticides. Therefore there are direct responsibilities under the Rotterdam & Stockholm Conventions while there are indirect responsibilities under the Basel & Minamata Conventions. Inter-agency responsibilities under the above four Conventions are fulfilled by official

representations at the National Coordinate Committee (NCC-BRSM) under the MMDE.

The Rotterdam Convention covers pesticides which are banned and severely restricted under the conditions of use in developing countries and countries of economies in transition. Under this Convention, banned and severely restricted pesticides are managed in a form of international information sharing during importation and exportation, which is called as "PIC", Prior Informed Consent Procedure.

The Stockholm Convention covers Persistent Organic Pollutant (POP) pesticides which are highly toxic and persistent in the environment and they have global concerns due to their transboundary transport. The global elimination and safe disposal of these types of compounds are the ultimate objectives of this Convention. The National & International Obligations under this Convention has been fulfilled by the ROP by participating at the development of National Implementation Plan (NIP) through the compilation of "POPs Pesticide Inventory" by the year 2016. This document provides an overview of the current state of the situation of POP pesticides in Sri Lanka as it pertains to availability of POPs pesticides, levels of environmental contamination, estimation of obsolete stocks, and identification of data gaps and action plans to implement the objectives by the Stockholm Convention.

In this regard, Sri Lanka has been prodigious in making decisions well advance of the announcement of international actions on POPs pesticides, banned and severely restricted pesticides under the Stockholm & Rotterdam Conventions, respectively; the current status is spectacular as that almost all POPs pesticides, banned and severely restricted pesticides have been de–registered and/or banned from major uses at least 15 years earlier. The inventory also revealed insignificant amounts of POPs pesticides (e.g. Aldrin, DDT, BHC & Endosulfan) waiting for disposal, which was estimated to be 71.53 kg (0.17%), available from few locations in government farms of the DOA. Thus, the use of the term "POPs pesticide stockpile" in terms of the Stockholm Convention would not be meaningful for Sri Lanka due to two reasons:

(i). there were insignificant stocks of obsolete POPs pesticides in Sri Lanka; and
(ii). there were no records of production and/or formulation of POPs pesticides in Sri Lanka and hence production discards were almost non–existent.

In the meantime, the ROP has been functioning in various capacities in the implementation of the above Conventions in the past within the scope & the mandate and in particular the representations at Chemical Review Committees (e.g. POPRC, CRC) & Conference of Parties (COPs), locally & internationally.

Change of Status of Sri Lanka's Position on Ethylene Oxide

Ethylene Oxide (EtO) had been declared as "No consent" under the Rotterdam Convention as per the previous decision by the PeTAC. According to the Ministry of Health sources, few hospitals are still using this chemical for medical instrument sterilization and are looking for alternatives of EtO. However, on the urgency of limited quantities for the medical sector, the ROP proposed a revocation to the earlier decision in October 2016, and

submitted a revised decision as "Consent with Restrictions" to the Rotterdam Convention Secretariat with the approval of the PeTAC. The interim response has been published in the PIC Circular Volume XLIV dated 12th December 2016.

PLAN FOR 2017

Pesticide Management in Sri Lanka

Program for registration of pesticides

- Acceptance of applications for new registration
- Acceptance of applications for re-registration
- Evaluation of technical dossier for registration for new registrations
- Evaluation of technical dossier for re-registration
- Preparation of new registration certificates
- Preparation of re-registration certificates
- Pesticides Technical & Advisory Committee (PeTAC) meetings
- Dialog with the pesticide industry & other stakeholders
- Pesticides sub-committee Meetings of Agricultural Pesticides Sub-committee
- Pesticides sub-committee meetings of Domestic & Public Health Pesticides Sub-committee
- Pesticides sub-committee meetings of Industrial Pesticides Sub-committee
- Evaluation & preparation of data for Agricultural Pesticides Sub-committee
- Evaluation & preparation of data for Domestic & Public Health Pesticides Sub-committee
- Evaluation & preparation of data for Industrial Pesticides Sub-committee
- Coordination of pesticides testing with the DOA (for its bio-efficacy)

Program for awareness on all relevant target groups assurance of safe use & judicious marketing of pesticides & collecting & compilation of pesticides related data

- Media programs:
- TV
- Radio
- Print media
- Training / Certification of Agrochemical Sales and Technical Assistants (ASTA)
- Awareness exhibitions
- Awareness programs for AUOs & Enforcement Officers
- Dealer Training Classes*
- Publishing revised guidelines for registration of pesticides/guidelines for registration of pesticide companies
- Services for participation as technical experts/ members/ resource personnel on invitations by the DOA/other institutions
- Collection & compilation dissemination of import statistics (Central Bank, Universities, Researches, Govt. Institutes, etc.)*

Program for compliance monitoring (Product quality and residues in environmental compartments & action against violation of the Control of Pesticides Act, No. 33 of 1980)

- Issue of import permits**
- Issue of sample import approvals**
- Evaluation of quality certificates in consignment basis**
- Screening of labels for approval**

- Screening of advertising materials for approval**
- Inspection of formulation factories
- Inspection of pesticides impurities
- Inspection of approved repacking facilities & stores
- Inspection & certification of premises of fumigation & house-hold pest control service providers
- Development & implementation of programs for empty pesticide container disposal
- Registration of pest control services***
- Approval of CH_3Br for quarantine & pre-shipment treatment on accountable basis
- Issue of restricted pesticide use permits (excluding CH_3Br) for pest control services
- Inspection of sales outlets
- Field complaints****
- Action taken to legal prosecution
- Issue of dealer training certificates
- Issue of dealer certificates by the AUOs
- Dispatch of samples to the MRI & other institute for obtaining test reports on suitability for acceptance of applications
- Issue of packing clearance as per the quality analysis of samples on consignment basis
- Establish a compliance monitoring scheme to assure the levels of pesticide residues in vegetables/ fruits/water
- Number of heavy metal analysis for food/ water
- Formulation analysis
- Acceptance of test reports for suitability (Bio-efficacy & heavy metal reports)
- Evaluation notifications send by the European Union (EU) (on pesticides residue)*****
- Under the EU audit residue analysis data base *****
- Other activities (such as field surveys)

Program for participation as technical expertise/members/resource person for intra & inter

- Ozone Unit of the Ministry of Mahaweli Development & Environment
- Basal/ Montreal/ Stockholm/ Rotterdam Conventions
- Department of Custom
- Ministry of Health
- Ministry of Agriculture
- National Library Services Council
- Sri Lanka Tea Board
- Ministry of Mahaweli Development & Environmental / CEA
- Sri Lanka Standard Institute
- Other

Program for income generation

- Fee for Agrochemical Sales & Technical Assistant (ASTA) (Rs.100.00)
- Fee for dealer certification (pesticide sales outlet) (Valid only for 1 year) (Rs. 550.00)
- Permit fee for import approval (Rs.1,000.00)
- Filing fee for restricted pesticides (Rs. 6,500.00)
- Registration fee for restricted pesticides (Rs. 4,000.00)
- Re-registration fee for restricted pesticides (Rs. 4,000.00)
- Filing fee for general/domestic pesticides (Rs. 75,000.00)

- Registration fee for general/domestic pesticides (Rs. 25,000.00)
- Re-registration fee for general/domestic pesticides (Rs. 4,000.00)
- Registration fee for pest control services (Rs. 20,000.00)
- Re-registration fee for pest control services (Rs. 5,000.00)
- Filling fee for company registration (Rs. 50,000.00)
- Registration fee for company registration (Rs. 50,000.00)

* As per the request.

** These targets will be decided depending on company requirements.

*** As per the request & fulfilling required qualifications.

**** As of number of received complaints

***** As these are special activities, items could be changed at any time.

STAFF LIST

Designation	No. Approved	No. Existing
Registrar of Pesticides	01	-
Deputy Registrar of Pesticides	01	-
Assistant Director of Agriculture (Research)	08	05
Assistant Director of Agriculture (Development)	02	02
Research Assistant (Special Grade)	01	-
Agriculture Monitoring Officer	02	01
Program Assistant (Agriculture)	02	02
Development Officer	04	04
Agriculture Instructor	06	05
Research Assistant	07	07
Public Management Assistant.	05	05
Technological Assistant	03	01
Driver	03	03
Storeman	01	01
Research Sub Assistant	01	-
Office Employee	01	-
Watcher	02	02
Laborer	05	05
Laborer (Contract)	02	02
Total	**57**	**45**

2.1.4 PLANT GENETIC RESOURCES CENTER (PGRC) - GANNORUWA

The objective for establishment of the Plant Genetic Resources Centre (PGRC) is to collect conserves and utilize the diversity of crop genetic resources. PGRC continues its efforts to explore, collect, introduce, conserve, evaluate and document the genetic diversity of food crops and their related species in order to achieve this. The biotechnology unit of the Centre mainly involves in molecular analysis, *in -vitro* conservation and cryopreservation of plant genetic resources. A total of 14,406 accessions of crop germplasm are currently conserved at the genebank in PGRC and 208 accessions conserved *in-vitro*.

The Plant Genetic Resources Center was awarded a special commendation in the inter Departmental level at the National Productivity Awards 2015 on 14th December 2016.

This report presents a summary of the progress achieved by PGRC in the year 2016.

BUDGET

Table 2.1.4.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure %
Recurrent	10,345,417	9,943,012	96
Capital	6,790,000	6,625,018	98
Projects			
• National Food production program (NFPP)	13,580,000	12,943,970	95
• Asian Food and Agriculture Cooperation Initiative (AFACI)	850,000	793,000	93
• National Agricultural Research Plan (NARP)	2,220,000	2,171,000	98
• Biodiversity for Food and Nutrition (BFN)	31,000,000	31,000,000	100
• Biodiversity Adaptation for Climate Change (BACC)	16,168,244	16,168,244	100
Total	**80,953,661**	**79,644,244**	**98**

PROGRESS

Germplasm Exploration and Collection

Exploration unit of PGRC continued its activities to collect Plant Genetic Resources of crops including their wild relatives (Table 2.1.4.2).

Table 2.1.4.2: Number of germplasm samples collected through explorations and received from research institutes

Crop Group	Number of samples collected	Number of Samples received from research institutes
Rice	63	140
Vegetable	239	24
Grain	46	16
Maize	10	09
Oil crops	10	07
Root and tubers	04	17
Total	**372**	**213**

Conservation of Seed Materials

The seed conservation unit of the PGRC is engaged in cold storage of germplasm and distribution of samples for utilization. During the year 2016, 800 new accessions were conserved in the genebank. In addition, 253 multiplied accessions were conserved. Total number of gene bank holdings at the end of the year was 14,406 (Table 2.1.4.3).

Table 2.1.4.3: The present conservation status of the genebank

Crop Group	No. of Accessions
Rice and related spp.	4,999
Other cereals and related spp	1,788
Grain Legumes	2,221
Vegetable Legumes	1,603
Solanaceous vegetables & Condiments & related spp.	1,387
Cucurbit vegetables	863
Brassicaceae vegetables	31
Alliums	21
Other vegetables	461
Leafy vegetables	185
Roots and Tubers	09
Mustard and related spp.	134
Oil crops	442
Fiber crops	67
Medicinal plants	30
Fruits	165
Total	**14,406**

Distribution of germplasm

During 2016, a total of 1427 accessions of different crop varieties were distributed to farmers, research stations, NGOs, and universities on their request (Table 2.1.4.4).

Table 2.1.4.4: Distribution of germplasm in 2016

Institute	No. of samples distributed
Universities	57
Research institutes	1049
Farmers and individuals	96
Other institutes	225
Total	**1,427**

Research on seed behavior

The conserved seed materials of several crops (Pumpkin, Ash Pumpkin, Capsicum, Finger millet, 'Kekiri', Cowpea, Soybean, Sesame and Tomato) for last five years were tested for viability. Among these crops Pumpkin and Ash Pumpkin showed decreased viability and other crops showed more than 85% germination.

Germplasm multiplication

Following crop germplasm samples were multiplied for conservation in the gene bank.

Table 2.1.4.5: Total No. of accessions multiplied in 2016

Crop	Scientific Name	No. of Accessions
Amaranthus	*Amaranthus* sp.	10
Ash Pumpkin	*Benincasa hispida*	05
Athu Gowa	*Brassica* sp.	02
Bajiri	*Echinochloa glabrescens*	01
Bitter gourd	*Momordica charantia*	06
Black Gram	*Vigna mungo*	01
Bottle gourd	*Lagenaria siceraria*	05
Brinjal	*Solanum melongena* (L.)	132
Chilli	*Capsicum* sp.	97
Cluster Bean	*Cyamopsis tetragonoloba*	01
Common Bean	*Phaseolus vulgaris* (L.)	31
Cowpea	*Vigna unguiculata* (L.)	75
Cucumber	*Cucumis sativus* (L.)	05
Finger millet	*Eleusine coracana* (L.)	37
Foxtail millet	*Setaria italica* (L.)	02
Green Gram	*Vigna radiate* (L.)	08
Groundnut	*Arachis hypogaea*	36
Horse Gram	*Macrotyloma uniflorum* (L.)	03
Kekiri	*Cucumis melo* (L.)	01
Lima bean	*Phaseolus lunatus*	02
Luffa	*Luffa acutangula*	03
Maize	*Zea mays*	05
Mustard	*Brassica juncea*	03
Okra	*Abelmoschus esculentus* (L.)	77
Passion	*Passiflora edulis*	01
Proso millet	*Panicum miliaceum*	01
Pumpkin	*Cucurbita maxima* (L.)	03
Red Onion	*Allium cepa* (L.)	16
Rice	*Oryza sativa* (L.)	08
Seeni kekiri	*Cucumis melo* (L.)	02
Sesame	*Sesamum indicum*	04
Sesbania	*Sesbania* sp.	01
Snake Gourd	*Trichosanthes cucumerina* (L.)	03
Sorghum	*Sorghum bicolour* (L)	04
Soybean	*Glycine max*	179
Spinach	*Spinacia oleracea*	02
Sun flower	*Helianthus annuus*	01
Tomato	*Lycopersicon esculentum* Mill.	46

Crop	Scientific Name	No. of Accessions
Velvet bean	*Mucuna pruriens*	01
Wild rice	*Oryza* sp.	02
Winged bean	*Psophocarpus tetragonolobus* (L.)	19
Yard Long Bean	*Vigna unguiculata* (L.)	82
Total		**923**

Management of live plant collection in green houses and field

Five wild species of rice were conserved in green houses and 196 accessions of banana plants of 19 different types were maintained in the PGRC field.

Germplasm characterization and evaluation

Accessions of Chilli, Brinjal and Soy bean were characterized using morphological descriptors. Promising accessions of Soy bean, Chilli, Brinjal and Okra were selected for further studies in collaboration with the respective breeders. (Table 2.1.4.6).

Table 2.1.4.6: Number of germplasm characterized and evaluated in 2016

Crop	Scientific Name	No. of Accessions characterized/ evaluated	No. of accessions selected
Soy bean	*Glycine max* (L.)	100	05
Chilli	*Capsicum* Sp.	89	05
Brinjal	*Solanum melongena* (L.)	55	04
Okra	*Abelmoschus esculentus* (L.)	77	15

Introduction, multiplication and provision of traditional genetic resources to three agro eco systems for the adaptation to climate change (BACC project)

The study was conducted representing 'Kandyan home garden' (Udukumbura and Padupola), 'Village tank system' (Gampola and Yanthampalagama) and 'Owita system' (Millleniya) focusing the introduction, multiplication and making available traditional genetic resources suitable to three agro eco systems.

Traditional crops which are extinct from the farmer community though they are interested (Petti Wattakka, Imbul Pathola) as well as traditional crops which are suitable for the project site (Sesame, Finger millet, Okra and Cowpea) were introduced.

In 'Kandyan home garden', Farmer Field Fora (FFF) program was conducted in collaboration with farmers, PGRC officers and extension officers. Nine Okra and five Finger millet cultivars were accessed by farmers to find out the suitability and adaptability of the cultivars for the climate changes.

Among the nine Okra cultivars, three were selected by farmers considering their vigorous plant type, higher yield potential and better adaptability to the drought condition that prevailed in the project site in Yala 2016. Among the four Finger millet traditional cultivars, farmers suggested that 'Bala Kurakkan' was the suitable cultivar for the project site because of its short duration. Establishment of community seed bank, documentation and maintaining of community biodiversity register is in progress in three project sites.

Biodiversity for Food & Nutrition Project - BFN

The BFN project funded by GEF, with the goal of mainstreaming biodiversity conservation and sustainable use for improved human nutrition and well being, implements under three major components; knowledge base, policy, regulatory frameworks and markets, and raising awareness. Baseline status of agro-biodiversity, dietary diversity and associated traditional knowledge was completed in three selected pilot sites; Giribawa, Udukumbura & Niunhella. BFN has collected existing data and commenced nutritional composition analysis of 58 varieties/land races of 28 species of priority/ local agricultural species with a national nutrition database and website established for food and nutrition. Several awareness programs have been conducted to raise awareness and up-scale utilization of agro biodiversity at selected pilot sites including establishment of school home gardens, promotion of bee keeping and integrated pest management workshops. At the national level several activities are underway; to promote the utilization of food biodiversity for human nutrition and establish marketing strategies for nutrient rich, under-utilized, traditional crop varieties including local root & tuber crops; development of demonstration model plots; model urban home gardens; traditional knowledge documentation and dissemination; production and marketing of novel value added products; self-employment programs for women to popularize the use of nutritious herbal food and beverages; increasing local fruit and vegetable consumption of Sri Lankans through 'Hela bojun' sales centers with elucidation of the nutritional value of local food at 'Hela bojun'. The policies encompassing biodiversity, food and health have been reviewed, in addition revisions in the National Biodiversity Strategies & Action Plan (NBSAP) document 2016-2022.

Biotechnology

Development of a mini-core collection of traditional varieties

This work was carried out to identify representative accessions each from 8 commercially important traditional varieties (Sudu Heenati, Kaluheenati, Suwandal, Pachchaperumal, Kruluthuda, Madathavalu, Pokkali, Suduru samba). Seed morphology analysis was completed. DNA was extracted from all accessions of this varieties and molecular analysis of Sudurusamba, Suwandal, Madathavalu, Pachchaperumal, Kaluheenati, Pokkali and Kuruluthuda was completed using 31 SSR markers. Plant morphological characterization of 'Suwandal' was completed. The information will be useful for authentication of traditional varieties for conservation, use and seed certification for commercial cultivation.

Phenotypic and molecular characterization of rice germplasm for drought tolerance (NARP funded project)

The objective of this study was to identify drought tolerant accessions based on phenotypic and molecular characterization data for development of drought tolerant lines. Out of 48 accessions *Oryza eichingeri* (wild relative of rice), three traditional rice accessions; 'Podi niyanwee', 'Goda heenati', 'Al wee' and two improved rice accessions *viz.* Bg 300, LD 12-38 were identified as drought tolerant entries. Three responsible genes for drought tolerance in these accessions were sequenced.

Molecular characterization of *Annona* germplasm (NARP funded project)

The genetic diversity assessment was conducted using ISSR markers for 24 randomly collected and 5 accessions known for sweetness of *Annona muricata* available at Agriculture Research Station Girandurukotte. Dendrogram derived from ISSR data grouped the germplasm into ten distinguished clusters. The results also revealed that there is a great extent of genetic diversity exists among *Annona* accessions showing only 2 duplicates. There were no relationship observed with sweet accessions and clustering pattern based on ISSR data. Molecular characterization for another set of 19 accessions selected for high Brix value using five ISSR primers was completed.

Tagging of Yellow Vein Mosaic Virus (YVMV) resistant genes in wild Okra (NRC funded project)

This was initiated to tag the resistant genes in wild Okra using molecular techniques to incorporate YVMV resistant character from wild okra species (*Abelmochus angulosus)* to popular Okra variety MI-7. Inheritance study revealed that the disease resistance in wild okra is governed by two recessive genes in an additive manner. Molecular analysis was done using more than 75 RAPD primers. Three RAPD primers were identified with polymorphism that can be used to tag resistance.

Analysis of Genetic Diversity of 'Nai miris' (*Capsicum chinense* Jacq.) using Simple Sequence Repeat (SSR) Markers (IMPGR funded project)

Studies were carried out to identify the genetic diversity of 'Nai miris' germplasm conserved in the seed bank at the PGRC. Molecular characterization was done for selected 25 'Nai Miris' germplasm with two *C. annuum*, two *C. frutescens* and one *C. baccatum* accessions using 14 SSR markers. The dendrogram derived from SSR data grouped the selected germplasm into three distinguished clusters. While 88% of 'Nai miris' germplasm grouped into one cluster, *C. annuum* and *C. frutescens* were separated into two clusters. The results also revealed that there is a great extent of genetic diversity exists among the 'Nai miris' germplasm. There were no duplicates and while 3 'Nai miris' accessions clustered out of the 'Nai miris' group. This study will be useful in 'Nai miris' selection programs and conservation activities.

Morphological and Molecular characterization of selected *Dioscorea* accessions for analyzing diversity and duplicates (IMPGR funded project)

This study was done to analyze genetic diversity and to identify duplicates among 35 *Dioscorea* accessions conserved in PGRC.

Morphological characterization was done using morphological characters and molecular characterization was done using 15 SSR primers for 32 *Dioscorea* accessions. High genetic diversity was obtained with two sets of duplicates.

Conservation and maintenance of plant genetic resources of *Dioscorea,* sweet potato, potato and banana under *in-vitro* and plant house conditions

A total of 208 accessions comprising sweet potato (104), *Dioscorea* spp. (72), potato (15) and banana (17) were conserved *in-vitro* while sweet potato and *Dioscorea* were maintained in the plant house and field in addition.

Dioscorea micro tuberization as a tool for long term conservation and planting material production (NARP Project)

This research was initiated to identify *in-vitro* conditions for *in-vitro* microtuberization and testing the conservation conditions in *Dioscorea.* Culture initiation and multiplication conditions were indentified for 05 accessions while tuberization media were developed for 02 accessions and other accessions are under testing conditions.

Mutation induction in *Dioscorea*

This research is conducted to develop mutants with altered plant architecture. In order to achieve this, plantlets were produced via chemical mutagenic agents. Produced plants are at growth stage. Modified MS media with combination of 2.5 or 3 mg/l BAP was identified as better medium for *Dioscorea* callus induction. Plantlets regenerated better in MS medium with 2 mg/l BAP and mg/l NAA BAP than in other tested media.

Plant Genetic Resources (PGR) Information Management System

Presently database contains passport data of 14,100 accessions and characterization data of 25 crops including rice, Maize, Finger millet, Foxtail millet, Sorghum, Cowpea, Mung bean, Black gram, Soybean, Pigeon pea, Groundnut, Bean, Winged bean, Yard long bean, Brinjal, Tomato, Capsicum, Okra, Pumpkin, Snake gourd, Bitter gourd, *Amaranthus*, Smooth luffa, Mustard and Sesame.

A survey has been done to collect data on fruit trees conserved at research stations and other institutes of the Department of Agriculture. Information on fruit trees including the GPS coordinates (longitude and latitude) was recorded. This information on 1,489 fruit trees was included in the database of PGRC.

Training and awareness programs

Training programs and awareness programs are conducted by the PGRC regularly. Many farmer groups also visited to gain knowledge in conservation of plant genetic resources (Table 2.1.4.7).

Table 2.1.4.7: Number of training programmes conducted at PGRC

Training program	No. of groups	No. of participants
University Students	10	500
Agriculture Diploma students	11	600
In-plant training students		21
School children	135	8,900
Teachers	03	150
Other officers	04	120
Farmer groups	06	210
DOA and other Departments		180

One student for MPhil degree and 10 undergraduates conducted their research for partial fulfillment of degrees under the supervision of staff in the biotechnology division.

PLAN FOR 2017

- Exploration and collection of Plant Genetic Resources (PGR) of traditional varieties, recommended varieties, other genetic stocks and crop wild relatives
- Conservation, maintenance and distribution of PGR
- Multiplication of different crop germplasm
- Characterization, evaluation and genetic analysis of germplasm
- Morphological and molecular characterization of selected *Dioscorea* accessions for analyzing diversity and duplicates
- Studying the Use of *Dioscorea* micro tubers as a tool for long term conservation and planting material production
- Protocol development for *in-vitro* conservation of Innala
- Development of a mini-core collection of selected traditional varieties conserved at PGRC
- Phenotypic and molecular characterization of rice germplasm for drought tolerance
- Protocol development for cryopreservation
- Tagging of Yellow Vein Mosaic Virus (YVMV) resistant genes in wild Okra
- Mutation induction in *Dioscorea*
- Molecular characterization of *Annona* germplasm
- Maintenance and improvement of the data management system of PGRC
- Conducting awareness program on PGR conservation and management

STAFF LIST

Designation	No. Existing
Deputy Director of Agriculture	01
Assistant Director of Agriculture (Research)	06
Program Assistant (Agriculture)	02
Development officer	03
Agriculture Instructor	03
Research Assistant	05
Public Management Assistant	07
Technological Assistant	03
Driver	04
Tractor Operator	01
Storeman	01
Lorry Cleaner	01
Electrician	02
Technician	01
Research Sub Assistant	04
Circuit Bungalow Keeper	01
Office Employee	01
Watcher	05
Laborer	33
Laborer (Contract)	02
Total	**86**

2.1.5 NATIONAL PLANT QUARANTINE SERVICE (NPQS) - KATUNAYAKE

The mandate of the National Plant Quarantine Service of Sri Lanka is to facilitate the import and export of pest free plants and plant products, for the development of agriculture and related industries in the country. To achieve this, emphasis were given to both research and service oriented quarantine activities. Phytosanitary certification, inspection and treatment of import and export plants and plant products, testing of detained samples, issuing of import permits for plant and plant products, pest risk analysis, field certification for fruits and vegetables and pack house registration, dissemination of knowledge on all aspects of plant quarantine via training and awareness programs for interested groups are the main activities accomplished in collaboration with national research institutes, universities and institutes and centers of DOA. This report gives the achievements made on financial, technical and service oriented activities carried during 2016.

BUDGET

Allocation given and expenditure incurred under recurrent, capital and projects are given in Table.

Table 2.1.5.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	14,534,021	13,757,344	95
Capital	7,915,000	4,953,023	63
Projects			
• National Food Production Program	30,900,000	30,900,000	100
Total	**53,349,021**	**49,610,367**	**93**

PROGRESS

Plant Quarantine Operation Division

Activities carried out by the Plant Quarantine Operation Division within the year 2016 are listed in the Table 2.1.5.2.

Table 2.1.5.2: Activities carried out in 2016

Activity	Progress
Registration of interceptions	369
Number of interception reports sent	346
Registration of inspections	1,521
Number of inspection reports sent to entry points	1,447

Activity	Progress
Registration of coir products for testing	463
Reports for tested coir products	412
Registration of imported seed potatoes for testing	29
Reports for tested seed potatoes	32
Registration of submitted samples for testing	40
Field certification for EU exports	40
Number of import permits issued	3,901
Registration of Korean net houses, fruits and vegetable fields and pack houses	44

Except for these activities which are related to the plant quarantine operations, the division has coordinated and carried out 27 comprehensive training programs on plant quarantine activities and procedures for various stakeholders (undergraduates/ diploma and school students/ teachers/ exporters/ importers etc.) in plant quarantine. For capacity building of plant quarantine officers, 09 training and awareness programs were conducted at National Plant Quarantine Service. In addition, information related to pest status and agronomic practices on some crops were provided to export destination countries to carry out pest risk analysis as the initial steps to prevent introduction of pests.

ENTOMOLOGY DIVISION

Testing for insect pests, mites nematodes in exports and imports consignments

a) Exports

- 13,962 export foliage plant samples were collected from 29 export foliage nurseries and tested for plant parasitic nematodes.118 samples were contaminated with plant parasitic nematodes.
- 18,602 export foliage plant samples were tested for insect pests, snails and mites. 16 samples were contaminated.
- 414 export coir samples collected from 30 coir factories were tested for insect pests, mites and plant parasitic nematodes. No contaminations were recorded.
- 16 other special samples submitted by the foliage exporting nurseries were tested for plant parasitic nematodes and insect pests for facilitation of their pest monitoring program.

b) Imports

- 28 imported seed potato consignments were inspected at the Sea Port. These 68 samples were collected and tested for insect pests and plant parasitic nematodes. No contaminations were recorded.
- 708 imported plant materials including hybrid Maize, Groundnut, Cashew nut, Soya, *Sphagnum* peat moss, fermented Cocoa beans, Durian, Dragon eye (Longan), Lychee, Mangosteen, Tamarind, Zapota etc. were tested for insect pests, mites and plant parasitic nematodes and 12 samples were found to be contaminated

with common stored pests and plant parasitic nematodes.

c) Trainings

- A large number of students from the Universities, Technical colleges and schools were trained under the Entomology division.

d) Research programs

- Identification of plant parasitic nematodes in export consignments of foliage plants.

PATHOLOGY DIVISION

Testing for pathogens in export and import consignments

a) Exports

- **Foliage and coir**

  16,494 samples were tested and following pathogens were detected; *Mucor* spp., *Aspergillus* spp., *Aspergillus niger*, *Aspergillus flavus*, *Fusarium pallidoroseum*, *Fusarium* spp., *Fusarium solani*, *Pythium* spp., *Rhizopus* spp., *Colletotrichum* spp., *Colletotrichum gloeosporium*, *Thielaviopsis paradoxa*, *Curvularia* spp. *Pestalosia* spp., (-) Bacteria, *Geotrichum* spp., *Macrophomina* spp., *Penicillium* spp., *Cercospora* spp., *Xanthomonas* spp., *Erwinia* spp., *Erwinia carotovora* pv. *atroseptica*, *Erwinia carotovora* pv. *carotovora*, *Erwinia chrysanthemi*, *Ralstonia solanacearum*, *Enterobacter cancerogenus*, *Cylindrocarpon* spp.

- **Tissue culture plants**

  A total of 3,572,668 plants were examined during 70 inspections. Contaminated containers with samples were rejected during inspections and necessary instructions were given to improve the quality of products. Gram negative (-) pathogenic type bacteria were identified.

- **Food, Fruit and Vegetables**

  07 samples were tested and following pathogens were detected; *Mucor* spp., *Aspergillus* spp., *Aspergillus niger*, *Fusarium* spp., *Fusarium solani*, *Colletotrichum* spp., *Colletotrichum lindemuthianum*, *Rhizopus* spp. *Alternaria* spp., *Curvularia* spp., *Pestalotia* spp., *Rhizoctonia* spp., (+) Bacteria.

b) Imports

- **Seed potato**

  114 seed potato samples were tested and following pathogens were detected; Silver scurf, Common scab, Dry rot, Soft rot, Black surf, Netted scab and *Erwinia* spp., *Erwinia chrysanthemi*, *Erwinia carotovora* pv. *atroseptica*, *Erwinia carotovora* pv. *carotovora*, *Ralstonia solanacearum* , *Geotrichum candidum*, Potato Virus Y, Potato Virus S, Powdery scab.

  One potato consignment was rejected due to high incidence of *Geotrichum candidum*, Potato Virus S, Netted scab exceeding permissible level and Powdery scab.

- **Seed and other plants materials**

  A total of 711 samples were tested and following pathogens were found; *Mucor* spp., *Rhyzoctonia* spp., *Erwinia* spp., *Erwinia chrysanthemi*, *Erwinia carotovora* pv. *atroseptica*, *Erwinia carotovora* pv. *carotovora*, *Geotrichum* spp., *Fusarium* spp., *Colletotrichum* spp., *Cylindrocarpon* spp., *Bacillus subtilis and Curvularia* spp. No quarantine pathogens were found.

c) Testing of submitted samples

Sixty nine samples were checked and suggestions and findings were given to the responsible parties.

d) Training

- 27 training programs were conducted.
- 32 undergraduate students/ diploma students were supervised.

e) Research programs

- Evaluation of quality of imported seed potato with respect to plant pathogens of quarantine significance.
- Identification of new foliage plant diseases in nurseries engaged in export market. (continuing)
- Investigation of presence of Maize wilt causal organism *Pantoea stewartii* in imported seed lots.
- Detection of potato viruses (PVA, PVM, PVS, PLRV and PVX) in imported seed potatoes using serological methods,
- Molecular Detection of *Clavibacter michiganesis* sub sp. *sepedonicus* in seed potato.

WEED SCIENCE DIVISION

Testing for weed contaminants in export and import consignments

a) Exports

- 722 export coco peat products, 261 food and 364 horticultural samples were tested.
- 84 coir consignments and 01 food consignment were failed in the tests.

b) Imports

- 168 import consignments were tested and 05 of them were found to be contaminated with soil and 32 consignments were found to be contaminated with weed seeds.

c) Training

- Over 500 individuals belonging to 17 groups of undergraduates, post graduates, teachers, school children and various other stakeholders were trained and 02 undergraduate research projects of thematic area “quarantine weeds” were supervised.

d) Weed Risk Analysis

- Thirty two weed risk analysis (WRAS) were carried out for various weed species.
- Baseline survey on *Echinodorus* species was finished.

e) Research programs

- Development of an interactive identification key to the seeds of the species belongs to *Abutilon*.
- Baseline survey for *Echinodorus* species.
- Identification of invasive traits of plants in their early germination stage.

f) Maintenance of reference collection

- The weed seed collection was upgraded with 13 new species.
- The herbarium collection was upgraded with 17 new species.
- The aquatic plant collection was upgraded with 02 new species and the structure was renovated to provide more knowledge to the visitors and officers.
- Literature collection was upgraded with 02 new additions.
- Crop seed collection was upgraded with 02 new additions.

BIOSECURITY AND INTERNATIONAL RELATIONS DIVISION

Pest risk analysis

- 04 complete pest risk analyses were performed on Blueberry plants to be imported from Japan, Importation of Bheema bamboo from India, Importation of Soya bean for oil extraction purposes and import of Bio-rat biocide for control of rats.

Pest risk assessments

- Thirty two rapid assessments were performed on commodities requested for importation in to Sri Lanka. (repeated).

Information for pest risk analysis

- Reports of Information for PRA were compiled and provided for
    - Export of Mangosteen to Egypt.
    - Export of *Cordyline* to Australia.
    - Export of Strawberry fruits to Thailand.
    - Export of *Codiaeum*, *Sansevaria*, *Zamioculcus* and *Synsephalum* to Thailand.

Conflict resolutions and trade negotiations

- Trade negotiations on soil contents in coir products exported to Australia.
- Trade negotiations on weed contaminants in coir products exported to New Zealand.
- Resolution of issues that arose due to coir exported to China which is a product Sri Lanka was not previously entitled to export to China.
- Trade negotiations on presence of Khapra beetle in virgin coconut oil exported to Australia.
- Conflict resolutions on exported coir material to Reunion Islands.
- Development of Guidelines for the plant quarantine officers on inspection of consignments destined to EU.
- Conflict resolutions on *Xylella fastidiosa* and *Bursaphelenchus cocophilus* entitling Sri Lanka as free from those pests.

TREATMENT TECHNOLOGY DIVISION

The activities of the treatment technology division include carrying out fumigation activities for export consignments/ intercepted consignments, registration of heat treatment providers under International Standards for Phytosanitary Measures 15 (ISPM 15), joint system audit for registered methyl bromide treatment providers under Australian Fumigation Accreditation Scheme (AFAS), regulating methyl bromide consumption for QPS purposes and sharing the information

with Ozone Unit/ Ministry of Environment, conducting training programs for treatment providers and other stakeholders, participation in quarantine regulators meetings and teleconferencing with International Cargo Cooperative Biosecurity Arrangements (ICCBA)/ Department of Agriculture and Water Resources Australia. In addition to that researches on new fumigants were also conducted during the year.

Fumigation Service for export consignments

Fifteen consignments of plant & plant products exported by different companies were fumigated at NPQS using Methyl Bromide.

Fumigation service for Imported Plants and plant products

Nine consignments of assorted flowers, intercepted by the plant quarantine units at the airport were fumigated before releasing to the importer.

Table 2.1.5.2: Commercial fumigations (small quantity) done at NPQS Katunayake during 2016

Commodity Type	No. of fumigations
Coir & coir products	05
Wood & wooden items	07
Fruits (Pineapple)	01
Flowers	01
Other	01
Total	**15**

Regulation of methyl bromide consumption under Montreal Protocol

Since Sri Lanka is signatory to the Montreal protocol usage of methyl bromide is allowed only for quarantine and pre shipment purpose. To comply with Montreal Protocol all requests made by the exporters are examined by the Treatment technology Division. During the year, 8,896 requests were examined for suitability of methyl bromide fumigations and 05 requests were rejected which did not come under Quarantine pre shipment (QPS).

Fumigation Supervision

466 Methyl Bromide fumigations were supervised for phytosanitary certification of export consignments from Sri Lanka.

Activities for Heat Treatment facility

Continuation of streamline process of Registered treatment providers under ISPM 15 and registered 03 treatment facilities under International Standards on Phytosanitary Measures No. 15 (ISPM 15).

Training/ Awareness Programs

- Training was organized on biosecurity treatment for 25 plant quarantine officers in collaboration with Department of Agriculture and Water Resources Australia under Government Partnership for Development Program.
- Awareness program was conducted for all the heat treatment providers in the country to upgrade their knowledge and to discuss weak points in the sector.
- A meeting was organized to finalize the irradiation regulation in the country.
- 20 training programs were conducted for various stakeholders on plant quarantine treatments. Eighteen students completed their in plant training requirements at NPQS.

Collaborative Activities

Joint system audit for methyl bromide treatment provider: Registered fumigation companies under AFAS were audited in collaboration with the Department of Agriculture, Australia and all the companies got accepted as to complying with AFAS.

NPQS participate in teleconferences under International Cargo Cooperative Biosecurity Arrangements, (ICCBA) Australia and quarantine regulators meeting (QRM) to share the knowledge in the field of biosecurity treatments.

Research Activities

Studies were carried out to introduce Ethyl Formate (Vapormate) as a fumigant alternative to the Methyl bromide. A research paper was published in Annals of the Sri Lanka Department of Agriculture 2015.

PLANT QUARANTINE STATION – AIRPORT, KATUNAYAKE

Main services of our unit are inspection and clearance of imported plant and plant products, inspection and issuance of phytosanitary certificates for exporting plant and plant products.

Table 2.1.5.3: Total revenue from phytosanitary certificates & cargo inspections – 2016

Month	Revenue (Rs.)
January	750,258
February	747,816
March	845,280
April	742,170
May	754,662
June	775,284
July	796,590
August	800,448
September	747,388
October	790,686
November	781,098
December	757,938
Total	**9,289,618**

Table 2.1.5.4: No. of phytosanitary certificates (PSC) issued and revenue earned – 2016

Month	No. of PSC issued	Revenue from issued PSC (Rs.)
January	4,671	56,052
February	4,718	56,616
March	5,265	63,180
April	4,660	55,920
May	4,701	56,412
June	5,027	60,324
July	5,195	62,340
August	5,054	60,648
September	4,719	56,628
October	4,953	59,436
November	4,929	59,148
December	4,699	56,388
Total	**58,591**	**703,092**

Table 2.1.5.5: No. of cargo inspections and revenue earned – 2016

Month	No. of cargo inspections	Revenue from inspections (Rs.)
January	4,628	694,200
February	4,608	691,200
March	5,214	782,100
April	4,575	686,250
May	4,655	698,250
June	4,766	714,960
July	4,895	734,250
August	4,932	739,800
September	4,605	690,750
October	4,875	731,250
November	4,813	721,950
December	4,677	701,550
Total	**57,243**	**8,586,510**

Table 2.1.5.6: Details of types of consignments inspected

Exported Commodity	No. of Consignments	Quantity (Pieces)	Quantity (kg)	Quantity (L)
Cut Foliage	5,239	129,603,954	41,314	-
Live plants	1,450	23,900,060	24,507	-
Unrooted Cuttings	70	1,427,810	-	-
Rooted Cuttings	80	1,288,869	-	-
Fruits	14549	800	7,573,741	-
Vegetables	17685	-	8,069,209	-
Coconut	865	10	129,394	-
Tea	5959	-	330,453	-
Aquatic plants	135	712,179	-	-
Coir	693	68	39,654.15	-
Betel	5457	-	3,756,606	-
Cut Flower	226	822,535	1,942	-
Spices	636	-	123,394	-
Tobacco	121	-	349,784	-
Coconut oil	369	-	101,125	372.10
Wooden Items	43	2	567.50	-
Coconut Products	251	-	59,954	24.11
Seeds	11	-	82	-
Rice	22	-	1,200.87	-
Wheat flour	6	-	42	-
Others	426	92,242	196,099.85	2.40

PLANT QUARANTINE STATION –SEAPORT, COLOMBO

Plant Quarantine Station at Seaport, Colombo is a major entry and exit point of Sri Lanka through which almost all the export and import consignments including plants and plant products having bulk quantities are exchanged. Tea, Rubber, Coconut products, Spices and food stuff are major export items and seeds as planting material, fruits, timber, animal feed and all the other commodities for consumption such as chilli, dhal, coriander, potato, onion etc. are the major imports with plant quarantine concerns.

Progress

No. of Phytosanitary certificates issued - 43,295
Income out of Phytosanitary certificates - Rs.519,540
No. of cargo inspection - 42,649
Income out of inspection - Rs.6,397,350
Total income - Rs.6916890
Total No. of export consignments - 38,201
Total quantity - 1,029,053.64 mt
Total No. of import consignments - 24,385
Total quantity - 1,651,088 mt
Total No. of destructions - 08
No of Treatments - 44

PLANT QUARANTINE STATION –AIRPORT, MATTALA

Exports

- 16 samples from 08 export factories were tested for insect pests, mites and test reports were submitted.
- Inspection reports were also submitted facilitating rice exports. Eight fumigations were also overseen.

PLANT QUARANTINE STATION – GANNORUWA

The activities of the Unit during 2016 includes, issuance of phytosanitary certificates, inspection of nurseries and providing instructions.

During the year, 214 phytosanitary certificates were issued and 27 nursery inspection visits were made and instructions were given to the nurserymen. 214 samples were tested and 61 factory inspections of export plants and plant products were carried out.

PLAN FOR 2017

Promotion of export of quality plants and plant products

- Export nursery inspections
- Factory inspection of export plants & plant products
- Other agriculture related export inspections (individual tissue culture plant evaluation)
- Sampling
- Document check
- Laboratory testing plant pathogens
- Laboratory testing plant insects
- Laboratory testing plant nematodes
- Laboratory testing weeds/ soil
- Submission of final test reports

Ascertaining the quality of imported seed potato

- Entry point inspection of seed potato
- Sampling

- Document check
- Laboratory testing plant pathogens
- Laboratory testing plant insects
- Laboratory testing plant nematodes
- Submission of final test reports

Ascertaining the quality of imported plant and plant products

- Entry point inspection
- Sampling
- Document check
- Receipt of samples submitted by entry points to NPQS
- Laboratory testing for plant pathogens
- Laboratory testing for plant insects
- Laboratory testing for plant nematodes
- Laboratory testing for weeds
- Submission of test reports
- Submission of final test reports
- Release
- Treatment recommendation
- Re-export or destruction

Ascertaining the quality of imported seeds

- Entry point inspections
- Sampling
- Document check
- Receipt of samples submitted by entry point to NPQS
- Laboratory testing plant pathogens
- Laboratory testing for plant insects
- Laboratory testing for plant nematodes
- Laboratory testing for weeds
- Submission of test reports
- Submission of final test reports
- Release
- Treatment recommendation
- Re-export or destruction

Prevention of imports done without fulfillment of phytosanitary requirements

- Document check
- Sampling
- Testing for pathogens in intercepted plants
- Testing for insect pests in intercepted plants
- Testing for plant parasitic nematodes
- Testing for weeds
- Submission of test reports
- Submission of final test reports
- Treatment recommendation
- Treatment supervision
- Re-export
- Destruction

Post entry quarantine

- Field inspection
- Keeping plants at DOA premises
- Reports/ recommendations
- Submission of final reports

Treatment for eradication of pests found in export and import plants and plants products

- Fumigation at NPQS
- Supervision of fumigation done outside NPQS
- Issuance of fumigation reports
- Online approval for fumigation companies

Maintenance of reference collections

- Weeds and weed seed specimens
- Insects
- Disease specimens
- Live aquatic plants

Training and awareness programs for stake holders

- Trainings
- Supervision of undergraduates/Diploma students
- Awareness programs
- Workshops
- Seminars

Quarantine related research

- Pest surveys
- Pest Risk Analysis
- Weed control research
- Pathological research
- Entomological research
- Quarantine treatment research

Registration of plant nurseries, fruit & vegetable fields & pack houses

- Exporting plants to designated countries
- Field inspections
- Auditing
- Submission of reports

Evaluation of facilities available with treatment providers

- Inspection of sites
- Auditing

Issuing of Import permits and phytosanitary certificates

STAFF LIST

NPQS, Katunayake

Designation	No. Existing
Additional Director	01
Deputy Director	01
Assistant Director of Agriculture (Research)	05
Assistant Director of Agriculture (Development)	04
Administrative Officer	01
Research Assistant (Supra Grade)	01
Agriculture Monitoring Officer	02
Program Assistant (Agriculture)	05
Agriculture Instructor	17
Research Assistant	07
Public Management Assistant	08
Technological Assistant	04
Technological Assistant (Engineering)	01
Driver	05
Electrician	01
Office Employee	01
Watcher	06
Laborer	08
Laborer (Contract)	06
Sanitary Laborer (Contract)	01
Total	**84**

Plant Quarantine Station - Seaport, Colombo

Designation	No. Existing
Deputy Director	01
Assistant Director of Agriculture (Development)	04
Agriculture Monitoring Officer	03
Program Assistant (Agriculture)	02
Agriculture Instructor	11
Research Assistant	05
Public Management Assistant	01
Office Employee	01
Laborer (Permanent)	01
Laborer (Contract)	01
Total	**30**

Plant Quarantine Station - Airport, Katunayake

Designation	No. Existing
Deputy Director	01
Assistant Director of Agriculture (Development)	02
Agriculture Instructor (Supra Grade)	01
Research Assistant (Supra Grade)	02
Agriculture Instructor	21
Research Assistant	05
Technological Assistant	19
Public Management Assistant	01
Laborer (Permanent)	03
Laborer (Contract)	01
Total	**56**

Plant Quarantine Station - Gannoruwa

Designation	No. Existing
Assistant Director of Agriculture (Research) In Charge	01
Technological Assistant	01
Watcher	01
Laborer (Contract)	01
Total	**04**

Plant Quarantine Station – Mattala, Hambantota

Designation	No. Existing
Assistant Director of Agriculture (Research) In Charge	01
Assistant Director of Agriculture (Development)	01
Agriculture Instructor	01
Driver	01
Total	**04**

2.2 SEED & PLANTING MATERIAL DEVELOPMENT CENTRE (SPMDC) - PERADENIYA

High quality seed and planting material are the most important inputs to increase yield and quality of produce and minimize the unit cost of production in Agriculture. Seed and Planting Material Development Centre (SPMDC) plays a vital role in production, distribution & marketing seeds and planting materials effectively throughout the country. SPMDC has 28 seed farms under its purview to produce above basic seeds & certified planting materials. However, certified seeds of rice, other field crops and standard seeds of vegetable crops are produced through selected contract growers by 14 regional Deputy Director of Agriculture (seed) units scattered in the country. The SPMDC, at present, undertakes its functions through above mentioned DDA (Seed) at regional level, under the guidance of the Director (SPMD), Additional Director (Paddy and OFC), Additional Director (Vegetable, Planting Material and Sales Promotion), Additional Director (Potato), Head quarter Deputy Directors and Assistant Directors. Mission of the SPMDC is to assure the supply of quality seed and planting material at competitive prices to the farming community of Sri Lanka. Production of basic, certified/ standard seeds and certified Planting materials in government farms, supply of basic seeds to seed producers, multiplication of certified seeds through contract growers and supply for commercial cultivators, management of government farms, seed enterprise development and co-ordination, maintenance of buffer stocks of seed, co-ordination of seed and planting material supply are the major activities of the SPMDC.

Production, distribution & marketing of basic seeds of all locally recommended crop varieties of Paddy, Other Field Crops, Vegetables, Potato and quality planting materials of Fruits and Vegetables in acceptable quantities are the main challenges faced by the SPMDC.

Objectives:

- To ensure production and distribution of basic and certified seed.
- To provide technical assistance and support for the development of seed and planting material industry in the state sector and the private sector.
- To provide necessary training facilities and information on all aspects of seed and planting material to the stakeholders.
- To achieve the seed and planting material security in the country.
- To maintain seed buffer stocks.

The following activities were conducted during the year 2016, which includes Maha 2015/16 and Yala 2016 seasons in order to fulfill the objectives of the Centre.

BUDGET

Table 2.2.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	28,875,140	23,216,097	80
Capital	52,991,392	51,072,681	96
Projects			
• Accelerated Seed Farm Development Program	110,000,000	102,000,000	93
• Seed Production & Purchasing Program	295,000,000	294,940,000	100
• Seed & Planting Material Development Program	100,000,000	99,400,000	99
• Promotion of Local Seed Potato Production	45,000,000	38,140,000	85
Total	**631,866,532**	**608,768,778**	**96**

PROGRESS

PRODUCTION & SUPPLY OF SEED PADDY

Basic Seed Paddy Production

Basic seed paddy (seed paddy of Foundation and Registered classes) of 27 varieties was produced in government seed farms. Foundation seed paddy is produced using breeder seeds supplied by Rice Research and Development Institute Bathalagoda and its sub stations. Registered seed paddy (RSP) is produced by using so produced Foundation seed paddy (FSP). Certified Seed Paddy (CSP) which is used for the production of consumption paddy is produced by using Registered Seed Paddy.

In a Yala season the cultivated extent of paddy is about 500,000 ha and in a Maha season it is about 780,000 ha. Therefore about 1,280,000 ha of paddy is cultivated annually.

For the cultivation of this extent, the annual certified seed paddy requirement is about 6,400,000 bu and for the production of this amount of CSP, 160,000 bu of Registered Seed Paddy is required.

In Maha 2015/16 the production of RSP was about 68,458 bu and in Yala 2016 it was about 45,108 bu. Therefore the total annual production of RSP was 113,566 bu. The Department of Agriculture has supplied more than 80% of the total national RSP requirement which is well over the planned and widely accepted healthy supply of 25% of the total national RSP requirement.

Table 2.2.2 shows the basic seed paddy production in ten government seed farms in 2016.

Table 2.2.2: Basic Seed Paddy production in Government Seed Farms during 2016

Farm	2015/16 Maha			2016 Yala			Total			Grand
	FSP	RSP	CSP	FSP	RSP	CSP	FSP	RSP	CSP	Total
Kanthale	495	8,067	0	774	5,318	276	1,269	13,385	276	**14,930**
Ampara	164	6,194	513	363	5,434	2,222	527	11,628	2,735	**14,890**
Polonnaruwa	715	14,775	393	611	12,004	1,557	1,326	26,779	1,950	**30,055**
Paranthan	178	4,493	66	0	0	0	178	4,493	66	**4,737**
Ambalanthota	339	2,745	270	347	3,476	0	686	6,221	270	**7,447**
Karadiyanaru	86	5,512	496	148	3,065	938	234	8,577	1,434	**10,245**
Murunkan	0	3,063	2,736	0	0	0	0	3,063	2,736	**5,799**
Bataatha	231	1,748	395	215	2,464	242	446	4,212	637	**5,295**
Aluththrama	489	10,296	1,780	508	6,745	1,206	997	17,041	2,986	**21,024**
MahaIluppallama	1,166	11,298	438	1,178	6,602	0	2,344	17,900	438	**20,682**
Middeniya	0	0	677	0	0	0	0	0	677	**677**
Iginimitiya	88	267	0	0	0	0	88	267	0	**355**
Total (bu.)	**3,951**	**68,458**	**7,764**	**4,144**	**45,108**	**6,441**	**8,095**	**113,566**	**14,205**	**135,866**

Certified Seed Paddy Production

Some amount of the national requirement of Certified Seed Paddy is produced by the Department of Agriculture through its contract seed paddy production program. It was not implemented during last several seasons due to some decisions taken by the Ministry. However it was resumed in Yala 2014 and continued up to year 2016. Annual production was 40,524 bushels which is lower than that of previous year.

The Table 2.2.3 shows the purchasing of certified, commercial, and emergency seed paddy during 2016.

Table 2.2.3: Purchasing of Registered & Certified Seed Paddy during 2016

DDA Region	2015/16 Maha		2016 Yala		Total	
	Registered	Certified	Registered	Certified	Registered	Certified
Aluththarama	789	3,244	_	3,010	**789**	**6,254**
Pelwehera	_	2,646	_	954	**_**	**3,600**
Polonnaruwa	2,644	_	_	1,556	**2,644**	**1,556**
MahaIluppallama	_	2,840	_	1,317	**_**	**4,157**
Ampara	_	3,631	_	2,902	**_**	**6,533**
Kanthale	63	3,154	1,382	_	**1,445**	**3,154**
Killinochchi	_	2,598	_	714	**_**	**3,312**
Bata atha	_	3,923	_	2,442	**_**	**6,365**
Nikawaratiya	254	2,648	467	2,427	**721**	**5,075**
Thelijjawila	1,710	518	2,451	_	**4,161**	**518**
Total (bu)	**5,460**	**25,202**	**4,300**	**15,322**	**9,760**	**40,524**

Issue of Seed Paddy

For Yala 2016, about 63,007 bu. of seed paddy and for Maha 2016/17, 81616 bu of seed paddy has been issued. Therefore during the year 2016, about 144,623 bu of seed paddy have been issued by the Department of Agriculture (Table 2.2.4). There is a decrease in seed paddy supply in year 2016.

Table 2.2.4: Issue of Seed Paddy during 2016

Seed Class	For 2016 Yala	For 2016/17 Maha	Total (bu)
Foundation	420	764	1,184
Registered	45,209	52,193	97,402
Certified	16,025	26,887	42,912
Commercial	1,353	1,772	3,125
Total (bu)	**63,007**	**81,616**	**144,623**

PRODUCTION & SUPPLY OF SEEDS OF OTHER FIELD CROPS

Other Field Crop seed production of SPMDC for 2016 was planned and implemented with the aim of supplying a considerable proportion of seeds required for Food Production National Program 2016-2018. The SPMDC targets to produce and supply all necessary basic seeds (Foundation and Registered) and about 25 percent of the national certified seed requirement except in Maize and Groundnut. Maize is mainly cultivated using imported hybrid seeds and the demand for OPV Maize seeds in Sri Lanka is less than 5% of the total requirement. Therefore SPMDC targeted to supply this amount of OPV Maize seeds. Due to low multiplication rate, high seed rate and bulkiness, targeted production of Groundnut seeds was 15 percent.

With the use of breeder seeds supplied by the Field Crop Research and Development Institute and its sub stations, thirty eight varieties of twelve Other Field Crops were multiplied and produced in four different classes of seeds namely Foundation, Registered, Certified and Commercial. But due to high demand for seeds and shortages of certified or commercial seeds, germination tested seeds were also purchased and supplied in order to supply comparatively better seeds from available alternatives. Though it is named germination tested, all possible important quality parameters were tested to be qualified for purchasing.

Basic (Foundation & Registered) OFC Seed Production

Foundation seed production is done only in government seed farms, while registered seed production is done in both government seed farms and through the contract seed production system.

In the year 2016, 20,524 kg of foundation seeds, 11,135 kg of basic Big Onion bulbs and 118,688 kg of registered seeds were produced through both these systems. In comparison to the last year's production, both foundation and registered OFC seed production has doubled in 2016.

OFC Seed production in Government Seed Farms

OFC seeds of foundation and registered classes are mainly produced by Govt. seed farms. Seeds of other lower classes are also produced by them as a result of down grading of the seeds of targeted classes. Table 2.2.5 shows the contribution of each farm for basic OFC seed production and Table 2.2.6 shows variety and class wise production of OFC seeds by the farms.

Table 2.2.5: Basic Seed Production of OFC in Government Seed Farms during 2016 (Farm wise production)

Farm	Amount of seeds produced (kg)												Total
	Black gram	Green gram	Cowpea	Groundnut	Maize	Sesame	Finger millet	Chilli	Soybean	Big Onion Bulbs	Big Onion Seeds	Sun hemp	
MahaIluppallama	175	1,087	1,811	_	1,425	44	1,506	29.1	8,563	4000	_	296	**19,326**
Bata atha	1,142	407	3,040	1,069	3,996	340	4,736	106.9	557	_	_	569	**15,963**
Aluththarama	640	2,289	1,209	_	7,922	141	640	_	373	_	_	_	**13,214**
Polonnaruwa	595	762	1,706	348	890	410	518	4	55	2,000	_	_	**7,288**
Kundasale	_	_	1,092	_	1,512	_	284	_	_	2,920	18	_	**5,826**
Paranthan	170	466	1,020	2,392	_	360	_	_	_	_	_	1,277	**5,685**
Murunkan	_	_	_	4,852	_	_	_	_	_	_	_	_	**4,852**
Pelwehera	179	_	19	1,734	_	77	_	_	_	2,215	_	_	**4,224**
Middeniya	_	62	798	1,056	_	183	606	_	346	_	_	_	**3,051**
Malwaththa	338	207	586	380	187	_	_	_	_	_	_	_	**1,698**
Kanthale	68	_	27	_	_	_	_	_	114	_	_	417	**626**
Inginimitiya	226	_	_	300	_	_	_	_	_	_	35	_	**561**
Eluwankulama	_	_	_	400	_	86	_	_	_	_	_	_	**486**
Total	**3,533**	**5,280**	**11,308**	**12,531**	**15,932**	**1,641**	**8,290**	**140**	**10,008**	**11,135**	**53**	**2,559**	**82,800**

Table 2.2.6: Basic Seed Production of OFC in Government Seed Farms during 2016 (Variety and class wise production)

Crop	Variety	Amount of seeds produced (kg)								Year Total
		Maha 2015/16				Yala 2016				
		Found	Reg	Cert	Com	Found	Reg	Cert	Com	
Black gram	MI 1	106	229	125	_	653	945	170	_	**2,228**
	Anuradha	150	509	_	_	308	338	_	_	**1,305**
Green gram	MI 5	55	_	77	62	_	_	_	_	**194**
	MI 6	984	660	_	_	1,694	994	233	83	**4,648**
	Ari	_	_	75	_	363	_	_	_	**438**
Cowpea	MI 35	_	_	308	_	_	_	_	182	**490**
	Bombay	55	334	221	_	_	66	188	_	**864**
	Waruni	33	83	763	_	612	2,808	200	_	**4,499**
	Dhawala	104	1219	_	_	175	2,253	_	_	**3,751**
	ANKCP 1	123	808	_	_	269	_	_	_	**1,200**
	MICP 1	44	112	84	_	264	_	_	_	**504**
Soybean	PB 1	400	_	_	346	718	6,717	_	_	**8,181**
	MISB 1	_	_	_	_	373	1,454	_	_	**1,827**
Maize	Ruwan	540	3,229	1,025	_	74	113	_	_	**4,981**
	Bhadra	2,315	2,060	_	_	2,288	3,050	_	_	**9,713**
	MIHY 1	_	_	134	_	1,494	_	_	_	**1,628**
Groundnut	Thissa	3,181	1,947	_	_	2,332	3,488	_	_	**10,948**
	Indi	_	348	_	_	36	_	_	_	**384**
	Tikiri	20	650	_	_	123	_	_	_	**793**
	Anguna Jumbo	378	_	_	_	5	_	_	_	**383**
	ANKG 1	_	_	_	_	23	_	_	_	**23**
Sesame	Uma	62	67	473	_	331	180	124	384	**1,621**
	Malee	20	_	_	_	_	_	_	_	**20**
Finger millet	Ravi	_	_	_	_	_	1,612	_	_	**1,612**
	Rawana	1,237	250	_	_	720	3,282	_	_	**5,489**
	Oshada	348	327	464	_	50	_	_	_	**1,189**
Chilli seeds	MI 2	11.4	_	_	_	_	_	_	_	**11**
	Galkiriyagama	9.75	_	_	_	4	_	_	_	**14**
	MICH 3	7.95	_	_	_	107.1	_	_	_	**115**
Sunhemp		_	_	_	348	_	_	_	2211	**2,559**
Big onion bulbs	MIBO 1	_	_	_	_	6,920	_	_	_	**6,920**
	Damb Red	_	_	_	_	4,215	_	_	_	**4,215**
Big onion seeds	Damb Red	_	_	35	_	_	_	_	18	**53**
Total		**10,184.1**	**12,832**	**3,784**	**756**	**24,151.1**	**27,300**	**915**	**2,878**	**82,800**

Found – Foundation **Reg** – Registered **Cert** – Certified **Com** - Commercial

Certified Seed Production of Other Field Crops

Seeds of certified class are mainly produced through contract seed production system where as a small amount of certified and commercial seeds are produced as a result of down grading of seed lots in the process of production of higher classes of seeds in farm and contract seed production systems. A considerable proportion of national requirement of certified seeds of OFC is supplied by the Department of Agriculture.

OFC seed production under contract program is shown in the table 2.2.7 and 2.2.8.

Table 2.2.7: Amount of OFC seeds purchased through contract system and as germination tested seeds by Regional DDA (Seeds) Offices in 2016

DDAs Office	Amount of seeds purchased (kg)									Total
	Black gram	Green gram	Cowpea	Ground nut	Maize	Sesame	Finger millet	Chili	Soy bean	
Maha Illuppallama	8007	3,314	-	-	-	3002	-	152.7	366,091	380,567
Pelwehera	6,824	34,276	12,428	5,166	2,210	712	4,323	4,112.1	70,181	140,232
Aluththarama	10,904	52,812	4,934	49,771	10,094	1,050	1,416	-	733	131,714
Nikaweratiya	7,292	59,016	9,382	41,187	1,716	6,769	407	181.5	1,526	127,477
Bata atha	-	84,519	203	1,724	-	12,265	566	-	-	99,277
Vavuniya	38,907	1,486	1,554	44,517	297	-	-	120.6	-	86,882
Ampara	110	-	17,196	11,253	6,500	-	-	-	152	35,211
Kilinochchi	1,876	50	200	12,373	-	1,500	450	-	-	16,449
Polonnaruwa	10,567	-	-	-	-	-	-	-	903	11,470
Karadiyanaru	-	-	-	5,370	-	-	-	-	-	5,370
Kanthale	-	-	-	129	-	229	-	-	193	551
Total	**84,487**	**235,473**	**45,897**	**171,490**	**20,817**	**25,527**	**7,162**	**4,566.9**	**439,779**	**1,035,199**

Table 2.2.8: Amount of OFC seeds purchased through contract system and as germination tested seeds by Regional DDA (Seeds) Offices in 2016 (Variety and class wise)

Crop	Variety	Amount of seeds produced (kg)								Total
		Maha 2015/16				Yala 2016				
		Reg	Cert	Com	GT	Reg	Cert	Com	GT	
Black gram	MI 1	6,859	18,622	4,795	69	1,669	18,083	16,034	12,296	78,427
	Anurada	383	173	-	-	2,835	2,287	382	-	6,060
Green gram	MI 5	-	-	-	-	394	-	1,496	-	1,890
	MI 6	1,108	53,109	50	-	2,663	64,064	24,022	88,567	233,583
	Ari	-	-	-	-	-	-	-	-	-
Cowpea	MI 35	-	-	-	-	-	-	-	-	-
	Bombay	76	256	-	-	-	629	-	-	961
	Waruni	735	1,571	-	6,647	2,422	1,400	1,269	11,159	25,203
	Dhawala	208	1,842	-	-	-	15,459	208	-	17,717
	ANKCP 1	-	-	-	-	-	-	-	-	-
	MICP 1	-	500	-	-	-	1,516	-	-	2,016
Soybean	PB 1	-	9,325	10,318	5,556	20,464	37,922	49,166	305,382	438,133
	MISB 1	-	-	120	-	-	1,526	-	-	1,646
Maize	Ruwan	-	1,345	-	-	-	-	-	-	1,345
	Badra	-	8,692	-	-	2,036	8,410	-	-	19,138
	MIHY 1	-	334	-	-	-	-	-	-	334
Groundnut	Thissa	1,413	21,337	8,790	38,699	37,099	18,494	26,631	18,336	170,799
	Walawa	-	-	-	-	-	-	-	-	-
	Indi	-	447	-	-	-	-	203	-	650
	Tikiri	-	-	-	-	41	-	-	-	41
	Anguna Jumbo	-	-	-	-	-	-	-	-	-
	ANKG 1	-	-	-	-	-	-	-	-	-
Sesame	MI 1	-	-	-	-	-	-	-	-	-
	Uma	-	591	-	17,043	66	1,675	2,869	3,283	25,527
	Malee	-	-	-	-	-	-	-	-	-
Finger millet	Ravi	-	-	-	-	407	-	-	-	407
	Rawana	-	-	-	-	450	-	-	-	450
	Oshada	566	975	-	-	-	4,323	441	-	6,305
Chilli seeds	MI 2	-	-	-	-	-	821	-	-	821
	KA 2	-	-	-	-	-	270	26	-	297
	Galkiriyagama	-	-	-	-	-	751	410	-	1,161
	MI Green	-	-	-	-	-	-	-	-	-
	MICH 3	-	-	-	-	-	2,152	136	-	2,288
Total		**11,348**	**119,119**	**24,073**	**68,014**	**70,546**	**179,782**	**123,294**	**439,023**	**1,035,199**

Reg – Registered **Cert** – Certified **Com** – Commercial **GT** – Germination tested

Table 2.2.9: Total OFC Seed Production during year the 2016

Crop	Variety	OFC Seed Production (kg)					Year Total
		Found	Reg	Cert	Com	GT	
Black gram	MI 1	759	9,702	37,000	20,829	12,365	**80,655**
	Anurada	458	4,065	2,460	382	-	**7,365**
Green gram	MI 5	55	394	77	1,558	-	**2,084**
	MI 6	2,678	5,425	117,406	24,155	88,567	**238,231**
	Ari	363	-	75	-	-	**438**
Cowpea	MI 35	-	-	308	182	-	**490**
	Bombay	55	476	1,294	-	-	**1,825**
	Waruni	645	6,048	3,934	1,269	17,806	**29,702**
	Dhawala	279	3,680	17,301	208	-	**21,468**
	ANKCP 1	392	808	-	-	-	**1,200**
	MICP 1	308	112	2,100	-	-	**2,520**
Soybean	PB 1	1,118	27,181	47,247	59,830	310,938	**446,314**
	MISB 1	373	1,454	1,526	120	-	**3,473**
Maize	Ruwan	614	3,342	2,370	-	-	**6,326**
	Badra	4,603	7,146	17,102	-	-	**28,851**
	MIHY 1	1,494	-	468	-	-	**1,962**
Groundnut	Thissa	5,513	43,947	39,831	35,421	57,035	**181,747**
	Walawa	-	-	-	-	-	**-**
	Indi	36	348	447	203	-	**1,034**
	Tikiri	143	691	-	-	-	**834**
	Anguna Jumbo	383	-	-	-	-	**383**
	ANKG 1	23	-	-	-	-	**23**
Sesame	Uma	393	313	2,863	3,253	20,326	**27,148**
	Malee	20	-	-	-	-	**20**
Finger millet	Ravi	-	2,019	-	-	-	**2,019**
	Rawana	1,957	3,982	-	-	-	**5,939**
	Oshada	398	893	5,762	441	-	**7,494**
Chilli seeds	MI 2	11	-	821	-	-	**832**
	KA 2	-	-	270	26	-	**297**
	Galkiriyagama	14	-	751	410	-	**1,175**
	MICH 3	115	-	2,152	136	-	**2,403**
Sunhemp		-	-	-	2,559	-	**2,559**
Big onion bulbs	MIBO 1	6,920	-	-	-	-	**6,920**
	Damb Red	4,215	-	-	-	-	**4,215**
Big onion seeds	Damb Red	-	-	35	18	-	**53**
Total		**34,335**	**122,026**	**303,600**	**151,001**	**507,037**	**1,117,999**

Found – Foundation **Reg** – Registered **Cert** – Certified **Com** – Commercial **GT** – Germination tested

Table 2.2.10: Achievement of Targets of OFC seed production in 2016

Crop	Annual National seed requirement for 2016 (according to NFFP 16-18) (kg)	Targeted Percentage supply from SPMDC	Seed Production in 2016 (kg)	Seed Production as a percentage of national seed requirement
Soybean	831,825	25	449,787	54
Green gram	644,544	25	240,753	37
Finger millet	57,578	25	15,452	27
Chili	17,320	25	4,615	27
Black gram	354,660	25	88,020	25
Cowpea	384,220	25	57,205	15
Sesame	195,175	25	27,191	14
Groundnut	1,848,700	15	183,998	10
Maize	2,185,288	5	25,315	1

Seed production targets have been achieved or exceeded in Soybean, Green gram, Finger millet, Chili, and Black gram, while seed production has exceeded 50 percent of the target in Groundnut, Cowpea and Sesame. Maize seed production of open pollinated varieties has been limited due to difficulties of finding required isolation distances among scattered hybrid Maize cultivations. However total OFC seed production of 1,105,956 kg in 2016 is the highest in the last 10 years.

Droughts and heavy rains affected OFC seed production in 2016. Especially, big Onion bulb production cultivations were seriously affected by unfavorable weather conditions and could recover only about 10 percent of the expected yield.

Issue of OFC seeds during the year 2016

Issue of OFC seeds for Yala 2016 and Maha 2016/17 is shown in the following table. For Yala 2016, 195 mt of OFC seeds have been issued while 487 mt. of OFC seeds have been issued for Maha 2016/17. Therefore, during the year 2016, 683 mt. of OFC seeds have been issued. This is much higher than the annual OFC seed issues during the last 5 years.

Table 2.2.11: Issues of OFC seeds during the year 2016 (kg)

Crop	Yala 2016						Maha 2016/17						Year 2016					Grand Total
	Found	Reg	Cert	Com	GT	Total	Found	Reg	Cert	Com	GT	Total	Found	Reg	Cert	Com	GT	
Black gram	868	3,922	4,863	844	366	10,863	2,734	8,015	25,265	15,859	5,763	57,636	3,602	11,937	30,128	16,703	6,129	68,499
Green gram	308	4,015	73,120	8,168	803	86,414	259	4,336	50,208	4,211	13,616	82,630	567	8,351	123,328	22,379	114,419	269,044
Cowpea	1,502	4,230	6,752	8,587	10	21,080	483	3,709	11,703	1,259	2,803	19,957	1,985	7,939	18,455	9,846	2,813	41,038
Soya	1,154	779	15,457	8,535		25,924	624	17,842	9,489	7,619	31,229	66,803	1,778	18,621	24,946	16,154	31,229	92,728
Maize (OPV)	1,057	1,699	855			3,731	640	4,949	10,750			16,339	1,697	6,648	11,605			19,950
Maize Hybrid			121			121			48			48			169			169
Groundnut	4,203	3,403	8,358	11,821	13,317	41,102	1,038	38,626	15,601	21,774	39,818	116,857	5,241	42,028	23,959	33,595	53,135	157,958
Sesame	41	91	1,356	750	260	2,497	161	242	828	6,446	8,394	16,071	202	333	2,184	7,196	8,654	18,569
Finger millet	17	419	495	25	30	984	58	4,412	2,771	997	27	8,265	75	4,831	3,266	1,022	57	9,251
Chilli seeds	174	45	2,024	143	0	2,386	179	38	336	220	550	1,323	353	83	2,360	363	550	3,709
Sunhemp			3	513		516				109		109			3	622		625
Big onion bulbs											11,200	11,200					11,200	11,200
Big onion true seeds					222	222											222	222
Total	**9,324**	**18,601**	**113,403**	**39,385**	**15,007**	**195,840**	**6,176**	**82,169**	**126,999**	**68,494**	**213,400**	**497,238**	**15,500**	**100,770**	**240,403**	**107,880**	**228,408**	**692,962**

Found – Foundation **Reg** – Registered **Cert** – Certified **Com** – Commercial **GT** – Germination tested **OPV** – Open pollinated varieties

Production & Supply of Vegetable Seeds -2016

Basic seed production

There are 60 DOA recommended varieties of 18 vegetable crops grown in the country. Production of basic seeds of some varieties was carried out in 10 government seed farms (Table 2.2.12). Total seed quantity produced in 2016 is almost same that of year 2015. (1,968.1kg).

Table 2.2.12: Vegetable Basic Seed Production in Government Farms 2016

Crop	Quantity Produced (kg)		
	2015/16 Maha	2016 Yala	Total
Bean	508.7	792.6	**1,301.3**
Bitter gourd	6.0	_	**6.0**
Bushitavo	_	64.8	**64.8**
Mae	84.7	_	**84.7**
Snake gourd	35.8	171.7	**207.5**
Winged bean	26.0	_	**26.0**
Luffa	247.5	_	**247.5**
Chilli	23.2	_	**23.2**
Total	**931.9**	**1,029.1**	**1,961.0**

Standard Vegetable Seed Production

Both public and the private sector organizations were involved in the production of standard seed. The quantities produced by SPMDC in government seed farms and under contract growing program are indicated in Table 2.2.13. The total production in Year 2016 is less than that of the previous year (19,148.4 kg). The production was restricted in some crops based on the stocks available in relation to the average demand and supply.

Table 2.2.13: Standard Vegetable Seed Production (kg) by DOA-2016

Crop	Farm Program			Contract Program			Grand Total
	2015/16 Maha	2016 Yala	Total	2015/16 Maha	2016 Yala	Total	
Amarunthus	122.3	134.7	**257.0**	_	_	_	**257.0**
Bean	141.0	_	**141.0**	6,394.1	_	**6394.1**	**6,535.1**
Bitter gourd	_	70.4	**70.4**	_	_	_	**70.4**
Brinjal	36.0	49.3	**85.3**	_	_	_	**85.3**
Capsicum	87.2	555.2	**642.4**	_	_	_	**642.4**
Cucumber	18.4	_	**18.4**	_	_	_	**18.4**
Luffa	363.3	159.6	**522.9**	255.8	_	**255.8**	**778.7**
Mae	206.4	473.6	**680.0**	_	_	_	**680.0**
Okra	1,018.3	_	**1,018.3**	_	_	_	**1,018.3**
Raddish	5.3	_	**5.3**	_	_	_	**5.3**
Tomato	154.5	298.9	**453.4**	_	21.4	**21.4**	**474.8**
Spinach	23.3	_	**23.3**	_	_	_	**23.3**
Winged bean	12.1	_	**12.1**	_	_	_	**12.1**
Chilli	_	6.1	**6.1**	_	_	_	**6.1**
Melon	_	46.3	**46.3**	_	_	_	**46.3**
Total	**2,188.1**	**1,794.1**	**3,982.2**	**6,649.9**	**21.4**	**6,671.3**	**10,653.5**

Hybrid Vegetable Seed Production

F_1 hybrid seeds of Brinjal, Capsicum & Cucumber varieties were produced successfully in Aluttarama, Kundasale, Maha-Illuppallama & Ambepussa seed farms (Table 2.2.14).

Table 2.2.14: Hybrid Vegetable Seed Production in Govt. Farms (kg)-2016

Crop	2015/16 Maha	2016 Yala	Total
Bitter gourd	_	18.7	**18.7**
Cucumber	50.7	27.4	**78.1**
Capsicum	_	0.4	**0.4**
Total	**50.7**	**46.5**	**97.2**

Issue of Vegetable seeds during 2016

Vegetable seeds were distributed through the DOA sales outlets and the registered dealer network. These dealers include Agrarian Service Centers (ASCS), Cooperative societies, Farmer organizations, Provincial DOA and private registered seed merchants. Dealer network is strengthened in year 2016 through reactivating the members and appointing new dealers island wide. Quantities of vegetable seeds supplied by SPMDC are given in Table 2.2.15.

Table 2.2.15: Vegetable Seed Supplied by DOA – 2016 (kg)

Crop	Issues for 2016 Yala						Issues for 2016/17 Maha						Grand Total
	Breeder	Basic	Standard	Com.	Hybrid	Total	Breeder	Basic	Standard	Com.	Hybrid	Total	
Bean	43.75	195.0	4,469.82	_	_	**4,708.6**	450.1	363.8	6,194.4	_	_	**7,008.3**	**11,716.9**
Bitter gourd	2.8	41.8	527.61	_	_	**572.2**	3.7	24.8	790.6	85.74	_	**904.8**	**1,477.0**
Brinjal	_	2.74	318.69	_	44.69	**366.1**	0.04	6.88	221.2	30.8	35.27	**294.1**	**660.2**
Bushitavo	10.0	_	547.5	_	_	**557.5**	15.8	77.0	800.7	36.5	_	**930.0**	**1,487.5**
Capsicum	0.06	3.73	238.28	24.6	_	**266.7**	0.1	5.6	201.6	14.99	_	**222.3**	**489.0**
Cucumber	0.4	1.45	127.3	_	1.65	**130.8**	1.3	3.8	376.6	_	0.015	**381.7**	**512.5**
Luffa	9.4	4.65	332.5	_	_	**346.6**	6.1	17.3	939.9	_	_	**963.2**	**1,309.8**
Mae	_	68.0	912.2	_	_	**980.2**	18.0	90.2	1,590.8	_	_	**1,699.0**	**2,679.2**
Okra	_	86.7	1,020.3	_	29.58	**1,136.5**	_	43.9	1,791.8	_	0.12	**1,835.7**	**2,972.2**
Pumpkin	_	_	_	_	_	**0.0**	_	0.75	_	_	_	**0.75**	**0.75**
Thibbatu	_	_	11.2	_	_	**11.2**	_	_	1.0	_	_	**1.0**	**12.2**
Raddish	_	_	172.4	_	_	**172.4**	_	16.0	573.4	_	_	**589.4**	**761.8**
Snake gourd	4.8	55.0	2,422.2	_	_	**2,482.0**	3.2	84.3	1,650.1	_	_	**1,737.6**	**4,219.6**
Spinach	_	_	160.48	_	_	**160.5**	_	2.1	272.5	_	_	**274.6**	**435.1**
Sweet Melon	_	1.0	45.5	_	_	**46.5**	_	2.0	57.09	_	_	**59.1**	**105.6**
Tomato	0.235	2.56	98.8	_	_	**101.6**	0.22	1.3	124.6	_	3.43	**129.5**	**231.1**
Winged bean	_	24.5	1,447.0	_	_	**1,471.5**	_	40.8	1,023.2	135.9	_	**1,199.9**	**2,671.4**
Amaranthus	_	24.0	85.1	_	_	**109.0**	0.52	79.4	158.9	_	_	**238.8**	**347.8**
Total	**71.45**	**511.1**	**12,936.88**	**24.6**	**75.92**	**13,620**	**499.08**	**859.93**	**16,768.39**	**303.93**	**38.84**	**18,469.8**	**32,089.8**

Supply of Home Gardening Vegetable seed packs for "Sathutu Niwahana" Program in 2016

SPMDC supplied 500,040 Home Garden Vegetable seed packs consisting 6 crops and 52,126 small packs (10g) for raising nursery seedlings of Chilli, Capsicum and Brinjal for the above program conducted by the Ministry of Agriculture through the Department of Agrarian Development.

Production & Issues of Seed Potato in 2016

SPMDC Seed Potato production program is carried out only in seed farms. Pre basic (G_0) mini tuber production in year 2016 is little higher than that of year 2015 (879,033). Similarly basic and certified seed production in year 2016 also little higher than that of year 2015 (594.85 mt.).

Total seed potato production in government seed farms shows steady growth. Seed potato supply for certified seed production and cultivation also increased in the year.

Table 2.2.16: Production of Pre-basic (G_0) mini tubers, Basic (G_1, G_2 & G_3) and Certified (C_1 & C_2) seed potato during year 2016. (Variety Granola)

Season	Pre Basic (Number of G_0 mini tubers)	Basic (mt.)	Certified (mt.)	Total (mt.)
2015/16 Maha	950,695	_	68.634	68.634
2016 Yala		94.534	484.666	579.200
Total	**950,695**	**94.534**	**553.300**	**647.834**

Table 2.2.17: Seed Potato supplied by DOA during year 2016 (mt.)

Variety	2016 Yala	2016/17 Maha	Total
Granola (Basic & Certified)	44.253	575.538	**619.788**
Granola (mini tubers)		521,265	**521,265**

Production & Supply of Planting Material in 2016

Planting material production program was implemented in 20 DOA farms under the Farm Advance Account and produced budded plants, rooted cuttings, seedlings and suckers of fruit crops and few other crops were produced.

Total planting material production was 1,294,243 which is significantly higher than that of year 2015 (604,861).Under the budded fruit plant category 549,328 plants of 20 fruit crops were produced.

Total planting material supply was 837,975, which is significantly higher than that of year 2015 (492,317).

Table 2.2.18: Production and Supply of Planting Material in DOA Farm in 2016

Crop	Production	Issues
Budded Plants		
Avacado	14,952	8,360
Beli fruit	22,106	10,706
Durian	28,629	16,741
Wood Apple	20,106	10,014
Jak	20,829	18,888
Guava	3,263	2,878
Uguressa	1,700	1,243
Lime	9,335	10,376
Mango	218,932	138,932
Mandarin	17,689	3,070
Jambu	3,415	4,933
Orange	59,325	16,183
Rambutan	61,666	63,577
Sapodilla	3,113	2,057
Star fruit	12,191	9,559
Pear	2,154	3,106
Apple	60	87
Weralu	3,557	2,210
Anoda	26,237	28,063
Mangosteen	2,384	3,153
Garcinia	2,898	2,432
Other	14,787	17,240
Sub Total	549,328	373,808
Rooted Cuttings		
Grapes	1,650	2,159
Jambu	3,914	4,941
Pomegranate	194	25
Lemonime	21,356	17,873
Passion Fruit	1,552	997
Dragonfruit	2,700	1,830
Sesbania	11,006	6,992
Other (Pepper, Betal etc.)	12,514	2,060
Sub Total	54,886	36,877
Seedlings		
Amberella	15,487	10,796
Star fruit	5,402	569
Papaya	39,115	14,237
Pomegranate	74,226	37,773
Beli	5,485	829
Guava	96,470	62,995
Sesbania	1,985	2,482
Uguressa	1,145	1,386
Dwarf Drumstick	6,480	6,172
Lime	105,210	74,328
Mangosteen	5,738	2,504
Nelli	3,510	2,161
Anoda	112,449	106,196
Passion Fruit	56,268	26,710
Other (Tamarind, Aricanut, Teak, Mahogani, Neem, Coconut etc.)	70,989	24,761
Sub Total	599,959	373,899
Suckers		
Banana	22,200	6,583
Pineapple	67,870	46,808
Sub Total	90,070	53,391
Grand Total	**1,294,243**	**837,975**
Vegetable Pots (Chilli, Capsicum, Tomato, Brinjal)	65,969	75,600
Vegetable Plants (Cabbage, Cauliflower, Beet, Leaks, Salad leaves)	157,508	157,508

Performance of the Farm Advance Account

Table 2.2.19: Farm Advance Account-2016

No.	Farms	Gross Profit/ Loss (Rs.)	Net Profit/ Loss (Rs.)
1	Aluttarama	-2,408,602	-10,105,489
2	Ambalantota	1,467,410	-1,163,277
3	Ambepussa	-4,818,251	-9,794,323
4	Bataata	-9,237,063	-15,910,642
5	Kandapola	10,230,443	7,167,404
6	Kantale	22,843,885	19,419,457
7	Kundasale	1,364,903	-4,650,510
8	Mahailuppallama	25,209,969	15,193,009
9	Malwatta	5,733,125	1,817,192
10	Meepilimana	1,783,396	67,124
11	Middeniya	2,276,140	-1,311,945
12	Murunkan	3,221,282	729,430
13	Piduruthalagala	16,732,776	14,828,783
14	Polonnaruwa	13,682,507	6,528,311
15	Sita Eliya	6,317,167	1,849,871
16	Paranthan	3,181,436	-1,442,827
17	Karadiyanaru	-540,548	-3,948,986
18	Udaradella	5,413,159	1,998,168
19	Rahangala	2,414,918	-1,125,081
20	Bandaragama	4,426,791	3,509,738
21	Walpita	1,638,495	-662,467
22	Ulpothagama	1,622,623	-575,063
23	Pelwehera	-418,920	-691,394
24	Telijjawila	4,950,705	4,289,084
25	Weerapana	-4,856,845	-6,041,047
26	Income from sale of planting material by Horticulture Research Farms	99,237,574	84,467,098
	Total	**211,468,477**	**104,441,623**

PLAN FOR 2017

- Improvement of lift and main irrigation systems. (Allocation - 26.85 Rs.Mn)
- Purchasing of machineries and equipment (Allocation - 30.2 Rs.Mn)
- Land development and improvement of infrastructure facilities (Allocation - 29.5 Rs.Mn)

STAFF LIST

Designation	No. Existing
Director	01
Assistant Director of Agriculture (Development)	33
Administrative Officer	02
Agriculture Monitoring Officer	03
Program Assistant (Agriculture)	04
Development Officer	46
Agriculture Instructor	151
Farm Machinery Instructor	01
Management Assistant	81
Technological Assistant	90
Farm Clerk	27
Driver	70
Tractor Operator	36
Store Keeper	08
Machinist	03
Carpenter	02
Mason	01
Electrician	04
Plant Yard Attendant	02
Lorry Cleaner	07
Storeman	18
Research Sub Assistant	01
Budder	38
Circuit Bungalow Keeper	06
Office Employee	09
Watcher	164
Laborer (Permanent)	1,389
Sanitary Laborer	03
Laborer (Contract)	317
Total	**2,521**

2.3 SOCIO ECONOMICS AND PLANNING CENTRE (SEPC) – PERADENIYA

The SEPC functions as an advisory body, supporting the DOA and the Ministry of Agriculture, in formulating agricultural policies. The Centre conducts research and development planning, socio-economic research and agricultural policy analysis. The SEPC maintains a statistical unit to compile agricultural statistical information. The Centre also coordinates the activities of local and foreign funded projects of the DOA. In year 2016, socio-economic research and policy analysis were focused on economic and financial viability, and social acceptability of agriculture development programs and investment in agriculture and input policies. The Centre contributed to solve problems concerning food shortage, especially in the context of recent changes in government policies and changes in global and domestic economic environment by providing information to policy makers in developing strategies. The comprehensive program to build a database on cost and returns of major food crops on district and seasonal basis was continued. The SEPC was involved in 11 Socio economics research, 8 Production marketing studies, 5 Policy analyses, 25 Project evaluation studies and 5 Database management works during the year.

BUDGET

Table 2.3.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	5,060,062	4,974,188	98
Capital	2,030,200	2,006,773	99
Projects			
• National Food Production Program	700,000	642,675	92
Total	**7,790,262**	**7,623,636**	**98**

PROGRESS

Cost and returns of crop production

The costs and returns study of Maha 2014/15, and Yala 2015 for paddy, subsidiary food crops, root and tuber crops and vegetables was published. The data include unit total cost of production, farm gate prices, average yield and gross and net returns. The data are useful for making decisions on crop production and marketing at the farm level as well as in policy making at national level. Primary data have been already collected for 2015/16 Maha season study and data are being tabulated and analyzed.

AgStat 2016

The booklet on agricultural statistics comprising salient information on food crop sector was compiled and published. AgStat 2016 - Vol.

XIII contained numerous information such as socio economic data, land use types, extent and production, import and export, per capita availability, wholesale and retail prices. The statistical information provided in this booklet is widely used by researchers, policy planners, students, academics, administrators, farmers and entrepreneurs.

Crop Forecast

Crop forecast is a monthly publication of SEPC which monitors the monthly cultivation progress of paddy, other field crops and vegetables. This report provides information related to prevailing situation on crop cultivation, forecast the production, regional distribution of production, harvesting periods, occurrence of extreme weather conditions, pests and diseases. This would guide various stakeholders towards major policy decisions at national level. Twelve crop forecast reports were prepared during the year covering latter 2015/16 Maha, 2016 Yala, and early 2016/17 Maha. Crop Forecast Unit in collaboration with National Agriculture Information and Communication Centre (NAICC) developed a software named 'Crop Forecast Information System' to raise efficiency data flow at field level to national level. All information needed on present situation of crops will be generated from the system. Crop Forecast Unit conducted 20 awareness workshops in collaboration with National Agricultural Information & Communication Centre (NAICC) to Agriculture Instructors island-wide. Two workshops were conducted to train data entry officers at the offices for data tabulation.

Policy Guidance Provided

Director SEPC and an Assistant Director of SEPC were nominated by the President's Office of the Democratic Social Republic of Sri Lanka to a committee assigned to prepare a policy document regarding suitable periods of relaxing/ increasing import restrictions, and amount of tariff to be imposed on important crops to maintain domestic price stability. The report prepared at SEPC contains policy guidance on maintaining domestic farm income and food security on major food crops. The Director, SEPC participated monthly to the meetings at Cost of Living Committee and furnished information on domestic food availability.

Crop Enterprise Budget -2015

The enterprise budget for Paddy and selected other food crops. (Maize, Finger millet, Chilli, Red Onion, Big Onion, Green Gram, Black Gram, Cowpea, Soy Bean, Groundnut, Gingelly, Potato, Sweet Potato, Manioc, Vegetables, Pole bean, Brinjal, Okra, Beet root, Cabbage, Carrot, Capsicum, Tomato, Leeks, Luffa, Raddish, Knol khol, Bitter Gourd, Snake Gourd and Pumpkin) were published in February 2016. The budget includes costs and returns of cultivation of these crops with adopting recommended technology. The latest economic data such as input and output quantities were also given. These information are useful for entrepreneurs, farmers and policy makers when making production and marketing decisions and planning process.

Coordination of Project Preparation and Submission

Planning for the National Food Production Plan (NFPP) implementation continued for year

2017. All projects belong to the food crop production and productivity improvement program and the majority of the projects which comes under each thrust area are continued from year 2016 to year 2017. Accordingly, 34 proposals which fall to different thrust areas were collected, format checked, collated, compiled and submitted to the Ministry of Agriculture. The thrust areas were input management, natural resources management and adoption to climate change, youth and woman participation, knowledge management, food safety, consumer health and satisfaction and research and technology development. The projects were mainly focused on ensuring availability of quality seeds through joint programs to be implemented with state and private sector participation, conservation of agro-biodiversity, youth and women agri-entrepreneurship program, establish efficient service transfer through e-agriculture cum communication system and to have easy access to the people through multimedia approach and minimization of the use of pesticides, reduction of the excessive use of chemical fertilizer and harmful substances in the food production and educating the people in the same.

Co-ordination of Programs/ Projects

SEPC continued coordination of NARP projects and memoranda of understanding on behalf of the DGA.

Special studies

Evaluation study on self seed paddy production program

Addressing the target of enhancing paddy productivity and farm profits, a program was identified under National Food Production Plan (NFPP) to increase the usage of quality seed paddy among farmers. The pilot project of this self seed paddy production program was implemented in Anuradhapura and Polonnaruwa districts in 2016 Yala season targeting 100,000 farmers in each district. A field monitoring and evaluation study was conducted on self seed paddy production program by the SEPC. The progress of Anuradhapura district was 27% whereas it was 15% in Polonnaruwa district at the field level. Although unexpected drought at the beginning of the season and late distribution of inputs to farmers adversely affected achieving project targets and objectives, the majority of the respondents expressed favorable opinions about the project. The average yield and producer price of seed paddy production were higher compared to normal paddy production

Evaluation of fruit village program (2013-2015)

The fruit village establishment is a three year program spanned from year 2013 to year 2015. In year 2016, field monitoring/ evaluation was carried out to examine farmer-field level performance in 13 fruit villages that included 2 Sweet Orange villages (Batticaloa District), 3 Wood apple villages (Batticaloa and Hambantota Districts), 3 Sour soup villages (Kalutara, Kurunegala and Matale Districts), 2 Mango villages (Anuradhapura, Hambantota Districts) 1 Grape village in Polonnaruwa District, 1 Pears village in Nuwara Eliya District and 1 Pineapple village in Ampara District. The plants were established during year 2013 to 2015. Data were collected through a questionnaire regarding current situation of these fruit villages. A sample of beneficiaries from each fruit village was

interviewed and plant survival rates below 50% were reported at Wood apple village at Tissamaharamaya in Hambantota District. The available information indicates that the extension workers have visited the fruit villages several times but specific training on time of training need, distribution of plants on time, selection of suitable farmers are required to reach expected outcomes of the project.

Development of a web based crop forecasting system in Sri Lanka

Conventional method of crop forecasting and monitoring of production through reviving the reports with aggregated data provided by relevant officers has a delay and inability to find out the areas which should be focused. A study was carried out in collaboration with University of Colombo School of Computing (UCSC) under the thematic research program of National Science Foundation to develop a web based crop forecasting system to provide timely and reliable information on crop yields and area planted and production through the collection of agronomic and other farm information at farm level. This system involves three major components, namely: (1) collection of information on farm level crop information by means of information networking system; (2) crop yield/ production forecasting; and (3) dissemination of information on extent of cultivation and production forecast. Information on cultivation of different crops by farmers will be fed to the system using the tablet PC by the Agriculture Research and Production Assistant (ARPA). This information will be updated twice a month. The system has the facility of storing data and generating analytical tables which contain useful information such as cultivated extent, expected production, marketable surplus, losses due to flood, drought and pest damages at Agrarian Service Centre, District and National level for making decision in ensuring the food security, planning and monitoring. Further, all farmers are registered with this system and this data base can be used to provide information to farmers and to implement government program such as implementation of fertilizer subsidy scheme.

An investigation of direct cash transfer vs. price subsidy for fertilizer in paddy farming

Successive governments have been implementing fertilizer subsidy program for paddy as a major policy support since 1962, revising the level of subsidy and form of implementation from time to time with the objective of increasing paddy production in the country. With the growing concern of people on environment and sustainable agriculture, present government, in its 2016 budget, introduced direct cash transfer instead of price subsidy for fertilizer with the twin objectives of encouraging use of organic fertilizer and reducing use of chemical fertilizers. This study attempted to examine the use of fertilizer in paddy cultivation and its impact on yield and the farmers' perception on new fertilizer subsidy program. A field survey was conducted using a structured questionnaire in year 2016 with 210 paddy farmers in major paddy growing districts: Ampara, Polonnaruwa, Hambantota and Kurunegala in the Dry Zone and Kalutara and Gampaha in the Wet Zone. Descriptive statistics and t test were employed to examine the relevant hypothesis. Almost all farmers have received the cash transfer and applied the fertilizer. The total fertilizer use per hactare is slightly less than the total fertilizer use in

2015/16 Maha, but the difference was not significant. Actual cost incurred by farmers in 2016/17 Maha (cash transfer) is less than the cost incurred for fertilizer in 2015/16 Maha (price subsidy) in Ampara, Anuradhapura and Kurunegala Districts. Farmers in Gampaha and Kalutara Districts have saved around Rs. 750 and 1,000 respectively after applying fertilizer using cash transfer. If farmers had used same amount of fertilizer used in 2015/16 Maha in 2016 Yala, additional cost farmers would have to incur under cash transfer program would be around Rs 660, 460, 620 in Ampara, Anuradhapura and Polonnaruwa respectively. The majority of farmers are of the view that cash transfer system is better.

Seminars/ Workshops/ Training programs conducted by SEPC

A workshop on training on cost of cultivation for SEPC technical staff and on management for all staff was conducted at In-Service Training Institute, Gannoruwa, Peradeniya, on 23rd and 24th June 2016.

SEPC conducted two training workshops for officers who supply information for preparation of crop forecast report on 20th and 21st September 2016 at PGRC, Gannoruwa

Participation in various committees

Mr. T.H.C.S. Perera, Director, SEPC continued to serve as a member of the National Committee on Socio Economics and Policy Analysis of the Sri Lanka Council for Agricultural Research Policy.

Mr. H.U. Warnakulasooriya, Additional Director continued to served as the Chairman of the Price Committee of the DOA.

Mr. H.U. Warnakulasooriya, Additional Director, served in the working group for Trade Facilitation of DOA for National Trade Facilitation Committee (NTFC), and represented DGA on NTFC meetings.

Working as National Focal Points

Director, SEPC served as National focal point on Agriculture on Bay of Bengal Initiative for Multi Sectorial Trade and Economic Cooperation

Director, SEPC served as National focal point on Center for Alleviation of Poverty and Sustainable Agriculture.

Projects Conducted

Table 2.3.2: Total number of projects under different categories

Category	No.
Socio Economics Research	11
Agricultural Policy Analysis	05
Production and Marketing	08
Agricultural database management	07
Project Handling and Evaluation	26
Human Resource Development	01
Total	**58**

PLAN FOR 2017

- Compilation of booklet which contain current agricultural information – Agstat XIV.
- Baseline survey of the project on Post harvest management and value addition of fruits production.

- Project/ Proposals preparation, handling and directing
- Extent and production monitoring and diagnostic field visits on of National Food Production Program.
- An evaluation of vegetable sector in Sri Lanka.
- An appraisal of National Food Production Program.
- An evaluation of production and marketing of 'Keeri samba' rice variety Fruit village Evaluation program (2016 & 2017).
- Socio Economic evaluation studies on Soya bean production enhancement program (NFPP).
- Evaluation of Chili seed production village in Anuradhapura.
- Crop cut study of Maize cultivation in Anuradhapura District.
- Development of web based crop forecasting system for Sri Lanka, and development of 'Crop Forecast Information System'.
- Crop Forecasting reports – 2016/17, Maha, 2017 Yala, 2017/18 Maha.
- Market survey on vegetable seed quality (JICA) Phase (ii)
- Impact of traditional rice varieties in food security and economy.
- Development of economic pricing formula for DOA seeds.
- A study on adoptability and farmer's preference of recommended Groundnut varieties in Sri Lanka.
- Factors affecting sesame production and marketing in the Hambantota district.
- Evaluation study on Groundnuts production enhancement program under National Food Production Program.
- Study of chemical application on Low Country vegetables.
- Economic impact of 'Bojun hala' (Bata atha) establishment on women's households.
- Analysis of paddy land abandonment in Kothmale segment.
- Preparation of baseline survey report of Sustainable rice platform project.
- A comparison of the comparative advantage of Mung bean production third season cultivation and conventional upland cultivation.
- Crop Enterprise Budget: Fruit and Floriculture.
- Estimation of producer support for Agriculture commodities.
- Assessment of farm income and capital formation Case study.
- An economic evaluation of use of transplanter in paddy cultivation.
- Cost of cultivation study- 2015 Yala, 2015/ 16 Maha, 2016 Yala, 2016/17 Maha and 2017 Yala.
- Economics of mix vegetable cropping in Nuwara Eliya & Badulla Districts
- Identification and economic evaluation of farmer preference for variety attributes in Chilli, and Maize.
- A study on the productivity and profitability of Mahailuppallama seed farm.
- The influence of land tenureship on sustainability and environment externalities of Maize cultivation.
- Projecting future National requirement of Maize.

Identification of fresh fruit export performance, destinations, competitiveness and determinants.

- Consumer willingness to pay for naturally ripened fruits in the market.

STAFF LIST

Designation	No. Approved	No. Existing
Director	01	01
Additional Director	01	00
Deputy Director of Agriculture	02	01
Assistant Director of Agriculture	23	12
Administrative Officer	01	01
Economist Assistant	21	11
Agriculture Monitoring Officer	05	00
Development Officer	08	07
Agriculture Instructor	00	01
Public Management Assistant	08	07
Technological Assistant	03	03
Driver	06	05
Office Employee	01	01
Laborer	04	04
Total	**84**	**54**

3.1 EXTENSION & TRAINING CENTRE (ETC) - PERADENIYA

The Vision of the Extension and Training Centre is to achieve excellence in Agriculture through Agriculture extension, Education and Training. Mission is to dedicate to a sustainable agricultural development by developing human resources through agricultural extension, training and education with the identification of appropriate technology required for mandatory crops which are coming under the scope of ensuring economic and social revival of farmer prominent clients.

Extension & Training Centre plays a vital role to achieve highest level of productivity in the food crops sector to ensure food security of the country as well as to improve living standards of the farming community. Achievements of the Centre are focused on four main areas: Extension, Training, Agricultural Education and Examination. Following activities are conducted to achieve the objectives of the Extension and Training Centre by the respective units.

- Conduct Paddy, Other Field Crops, fruits and vegetables development programs island wide
- Direct extension programs under major irrigation schemes conduct by the six Inter-Provincial Units
- Collaborative extension programs with Provincial and Mahaweli areas.
- Conduct training programs for extension staff, farmers, entrepreneurs and others at three In-Service Training Institutes, four District Agricultural Training Centers and Farm Mechanization Training Centre.
- Conduct "Higher National Diploma on Agriculture Production & Technology" course (NVQ Level 6) at Schools of Agriculture Kundasale, Pelwehera, Angunakolapelessa, Vavuniya and Karapincha.
- Conduct "National Diploma on Agriculture Production & Technology" course (NVQ Level 5) at schools of Agriculture Wariyapola, Labuduwa, Bibile, Palamuna, Anuradhapura & Paranthan.
- Conduct NVQ Level 3-4 agriculture courses at schools of Agriculture Labuduwa and, Anuradhapura, HTDI Bibile, In-service Training Centers and District agriculture training Centers.
- Conduct Young Farmers Club activities.
- Conduct Bee development activities at Bindunuwewa Bee Development unit.
- Conduct Agribusiness counseling, Micro Irrigation & Protected Agriculture programs .
- Conduct Women's Agricultural Extension programs, promote local food consumption among public by establishing 'Hela bojun' sales centers and maintaining them.
- Horticultural crops development and Training activities at Bibile Horticultural Crops Training & Development Institute.

BUDGET

Table 3.1.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	133,570,421	116,893,863	88
Capital	122,412,021	110,030,159	90
Projects			
Funds under DOA Votes			
• Construction of new Hostel for Pelwehera Agricultural School	50,000,000	44,200,000	88
• Agricultural School Development	75,000,000	70,114,840	93
Funds under Ministry Votes			
• Construction of Hostel for FMTC under Skill Development program	50,000,000	36,849,000	74
• Self seed production for paddy	217,460,000	42,620,000	20
• Rice Export program	10,000,000	5,541,250	55
• National food production program -Paddy	67,500,000	62,950,000	93
• National food production program - Chilli Villages	153,314,000	123,648,015	81
• National food production program -Soya bean	23,060,000	22,589,600	98
• National food production program - Groundnut	22,900,000	9,169,000	40
• National food production program -Maize	60,810,000	49,261,810	81
• National food production program - Green gram	11,030,000	5,217,000	47
• Empowering women entrepreneurship through local food sales centres (Hela bojun alewi piyasa)	60,600,000	36,027,300	59
• Increase bee honey production of the country through formation of youth cooperation societies	4,500,000	2,933,000	65
• Agribusiness counseling program focusing certification of export agricultural food under GAP or Organic	29,500,000	17,900,000	61
• Organic fertilizer production and motivation for usage of organic fertilizers	6,295,000	5,208,740	83
• Establishment of a Demostration Unit for New Agricultural Technologies (DUNAT)	6,000,000	1,608,500	27
• Home Gardening Promotion Program	226,720,000	128,717,262	57
• Health Food Production Program	7,000,000	6,261,000	89
• AFACI	1,750,000	1,750,000	100
Total	**1,339,421,442**	**899,490,339**	**67**

PROGRESS

SPECIAL PROJECTS

1. Construction of New Hostel for Pelwehera Agricultural School

This special project was implemented in 2013 to improve hostel facilities for diploma students at School of Agriculture Pelwehera. The construction work of this hostel building completed during 2016 and ceremonially opened by Hon. Minister of Agriculture Mr. Duminda Dissanayake. Hundred students can be accommodated in this hostel.

2.. Agriculture School Development program

This project implemented in 2013 with the aim of improving library facilities, laboratory facilities, hostel facilities and other infrastructure facilities in NVQ level 6 Agriculture schools. Construction work of new buildings and renovation of old buildings in Agriculture Schools at Kundasale, Angunakolapelessa, Pelwehera, Vavunia and Karapincha were carried out through out the year. Construction of two hostel buildings at SOA Vavunia and ground floor of acedemic building at SOA, Karapincha were completed during the year . Other than that two storied acedemic building at SOA, Pelwehera was also completed and ceremonially opened by Hon. Minister of Agriculture Mr. Duminda Dissanayake during the year. This project will be continued in 2017 at above agriculture schools.

3. Construction of Hostel for FMTC under Skill sector Development Program

With the aim of improving hostel facilities for trainees of Farm Mechanization Training Centre, Anuradhapura this special project was implemented in 2015. Under this project 7 hostel units will be planned to build. Total capacity of these 7 cabanas is 84 trainees and in one cabana 12 trainees can be accommodated. Estimate preparation and designing of plan was carried out by North Central province Engineering services Department. Purchasing of furniture for hostel units completed during this year. Out of seven hostel units, roof work completed in threee hostel units. Construction work completed up to slab level in other five hostel units in the year. Remaining work will be completed in 2017.

4. Self seed production for paddy

Main objective of this projects was to promote self seed production to increase availability of quality seed paddy within Anuradhapura and Polonnauwa districts. To achieve this objective 1kg seed paddy packets were distributed among 59,001 farmers free of charge. Purified seed paddy packets each one containing 500g of seeds of traditional cultivars were also provided free of charge for selected 20 traditional paddy cultivators.

To promote the usage of parchute trays 1,150,043 trays were provided for above farmers with free of charge. Each farmer received 25 trays. Six training classes about parachute method were conducted to aware farmers. Printed materials also produced to aware general public and it included 320,000 leaflets,16,000 posters and 6 banners.

5. Rice Export Program

Objectives of this project were to adapt farmers to Good agriculture practices, direct them to produce quailty exportable rice and to

practice post harvest technology. Build a good relationship between rice exportesr, rice suppliers and paddy producers is another objective of this project.This project was implemented covering 600 ac within 5 inter provincial areas (Anuradhapura, Polonnaruwa, Moneragala, Ampara and Hambanthota) and Mannar Provincial area. Under this project awareness programs were conducted for stake holders and conducted parachute demonstrations by using 12,500 parachute trays. Five field days and 3 field tours were arranged to aware farmers. Other than above activities 100 bu of seeds and compost were distributed free of charge.

6. National Food Production program - Paddy

This program was implemented under the theme of "environmental friendly" to minimize the usage of pesticides and formalize the usage of chemical fertilizer in paddy cultivation. To fulfill this task agricultural machineries were introduced for ploughing, seeding, transplanting and weeding. Introduction of these machineries will not only help to minimize environment pollution but will also help to solve the problem of labour scarcity for the cultivation practices of different stages. Under this project 35 paddy transplanters, 33 box seeders, 33 power weeders, 72 disk ploughs, 650 grass cutters and 104 low land power weeders were purchased to distribute within provincial and inter provincial areas. To manage the soil fertility 3,755 soil samples were tested. With the aim of promoting efficient usage of urea, 10,400 leaf color charts were purchased and distributed among farmer groups in Anuradhapura & Polomaruwa Districts. To support seed paddy producing famers, 2kg packs of registered seed paddy, tarpaulin and storage bags were priovided to farmers under 50% farmer contribution basis. Total amount of RSP provided to farmers is 1,419 bushels. Other than that 172 tarpaulin and 21,385, storage bags were provided. In addition to above materials 2,000 demonstrations were established island wide to achieve potential yield. Conducted 317 training classes and 9 field days to aware the farmers about the program.

7. National food production program - Chilli villages

Objectives of this project are to reduce the imports of dry Chillli, introduce new technologies and promote off season cultivation to increase year round chilli production. Construction of agro wells and providing water pumps and rain shelters for the nurseries and commercial cultivations under 50% farmer contribution were the activities targeted to facilitate off-season cultivation. During the year under review, 622 agro wells were constructed and 51 rain shelters were provided. provide 495 (1/2 ac and 1/4 ac) sprinkler systems to farmers to increase water use efficiency. With the aim of increasing cultivation, 993 kg of Chilli seeds were distributed under 50% farmer contribution for new Chilli growers. Other than that farmers and officers were trained for quality seed production, manufacturing of value added products of green Chilli and dry Chilli by practicing IPM, GAP etc..

Under this project 40 training programs and 16 field days were conducted for the farmers, and also 18 media programs were conducted to promote Chilli cultivation. To establish

commercial Chilli farming areas, 12,783 nursery trays ,220 sprinkler units (1/2 ac) and 323 sprinkler units (1/4 ac), 1008 fuel and electric water pumps, 34 power sprayers, 15 chilli grinding mills, 11 sealers, 85 tarpaulin were provided to farmers. This project was implemented in all provinces except Sabaragamuwa and Western provinces.

8. National food production program - Soya been

Under this project seeds were distributed free of charge to cultivate 170 ha during yala season. Self seed production program was implemented in 180 ha. For contract seed production, seeds were distributed for 285 ha of land area. Inoculam also provided for above farmers to increase seed production. To aware about the program 75 number of farmer training classes, 2 field days, 130 media programs were conducted. Other than above activities 40 number of agro wells established and 12 agro wells were rehabilitated under the project. For research trials 760 ha cultivation was established within farmer fields and research stations.

9. National food production program - Groundnut

Under this project seeds were provided to establish 217 demonstrations on 50% farmer contribution. Those demonstrations were established in new cultivation areas. Machinery units were provided to 15 farmer organizatios. A machinery unit contain one decorticator and 3 inter cultivators. Also 5 number of officer training and 25 number of farmer trainings were conducted. With the aim of producing quality seeds, registered seeds were given to farmer societies to establish 132 demonstrations. 8,840 kg of certified seeds were provided on 50% farmer contribution to promote seed production. Other than above 42 sprinkler systems were distributed under 50% farmer contribution.

10. National food production program- Maize

To promote Maize cultivation in paddy lands during Yala season seeds were provided under 50% subsidized rate. Above seeds were grown in 1,100 ha extent of paddy lands in new areas. Other than above, seeds for 994 ha exent were provided under 50% subsidy to upland cultivations in new areas during Maha season and for high yielding demonstrations established in existing culltivation areas. But some cultivations damaged due to drought. Soil conservation practices were completed in 154 ha land extent in Badulla, Monaragala, Ampara, Anuradhapura and Kandy districts. Twelve machines (Inter cultivator with ridger) were distributed among farmer organizations. 105 training programs were conducted with field days. Pop corn seeds were provided with 50% farmer contribution to 18 ha land extent. With the aim of promoting MIH1 hybrid seed production, required seeds and fertilizer for 12 ha were provided free of charge . Special Maize production program with “Nidahas Badairigu Govi Sansadaya” was conducted in Anuradhapura district during the year.

11 . National food production program - Green gram

By this project Green gram seeds were supplied for the production sociaties under 50% farmer contribution to promote cultivation in new areas. Five cultivation villages were established and total land extent

covered by the villages are 285 ha. Seeds were supplied free of charge to selected 354 growers to establish 1ac demonstrations. For seed storage 2,100 triple layered bags were supplied to farmars on 50% farmer contribution.

12. Empowering women entrepreneurship through "Hela Bojun" Sales centres

The Project was done with the objective of local food promotion and providing entrepreneurship for women. During the year, Five "Hela Bojun" sales centers were opened at Pinnawala, Ampara, Nuwara Eliya, Polonnaruwa, and Mahiyanganaya. For theses 5 sales centres 150 women entrepreneurs were recruited.Three school canteens situated in Kandy city were converted to function as 'Hela Bojun' outlets. The canteens of Mahamaya Girls College, Girls High School and Kingswood College converted like this. 24 women entrepreneurs were recruited for these sales centres. With the assistance of Eastern province Transport service Authority 3 'Hela bojun' sales centres were started to construct at Padiyatalawa,Wakerei and Kantale. Other than that construction work of 3 'Hela bojun' sales centres started at Matara, Nittambuwa and Thinnaweli.

Subject matter officers of Women Agriculture Extension (WAE) island wide (35 officers) were trained on women agriculture extension activities and nutritional food promotion programs. Thirty eight new women's agricultural extension organizations were established all over the country. Thirty six training classes were conducted for 820 women island wide. Out of this, 154 women have been working in newly established 16 private 'Hela bojun' outlets.

With the aim of providing knowledge to begin their own business, 3 entrepreneur development programs were conducted for 60 women entrepreneurs attached to 'Hela bojun' sales centers, under the topic of "Start Your Business" with the financial support of Central Province, Department of industrial development. Participated in 04 exhibitions and 03 seminars under the theme of promotion of local healthy foods.

To introduce and popularize local food recipes which are unpopular in society, 08 video programs were recorded and telecasted.

13. Increasing Bee Honey Production of the country through formation of youth cooperative societies

Objectives of the project were to increase bee honey production of the country and develop entrepreneurship of selected youth. Six inter-provincial areas (Anuradhapura, Polonnaruwa, Ampara, Monaragala, Hambantota, Hasalaka), Kegalle and Kurunegala districts were selected to implement the project. Forty Bee honey production cooperative societies were formed (five at each selected districts) and a Bee colony for each member was provided free of charge. Technological support for the activities was given by the extension staff.

Steps were taken to strengthen activities of seven bee development sub units. Those units are 3 In-service training Institutes at Angunukolapelessa, Aralaganwila and Gannoruwa, 2 Schools of Agriculture at Vavuniya and Wariyapola, Horticulture Crop Training and Development Institute at Bibila and Bee development unit at Bindunuwewa. Apiaries were established at each centre and

essential equipment for bee keeping was supplied for above units.

Eight bee box manufacturers and sixteen bee keepers were selected from above districts and were trained at Bindunuwewa Bee Development Unit. Essential equipments for bee keeping were supplied for bee keepers.

14. Establishment of a mechanism to ensure quality and safety of Agricultural commodities to local and export markets through GAP

Under this project 400 GAP certified commercial farms and 22 government demonstration farms with GAP certification were developed. A total of 1,031 training classes were conducted for farmers and other stake holders. 19 field tours were conducted for farmers to show the successful GAP implemented farms. 12 media programs conducted and 12 books and leaflets were printed to aware the public. Gathered 1,229 commercial/ GAP farm information and recorded in data base. 57 number of GAP practicing farmer co-operatives were implemented. 1,194 export farms and pack houses were monitored.

15. Organic fertilizer production and motivation for usage of organic fertilizers

Objective of this project is to increase the usage of organic fertilizers. Under this project 1,311 Integrated Plant Nutrient System (IPNS) demonstrations established in six inter provincial areas. (Anuradhapura, Polonnaruwa, Hasalaka, Monaragala, Hambanthota,and Anuradhapura). During the year 74 farmer training programs were conducted to 1356 farmers and 23 field days were conducted with the participation of 642 farmers.

16. Establishment of a Demostration Unit for New Agricultural Technologies (DUNAT)

Objectives of this project were demonstrate how to establish a mango cultivation with modern technologies and achieve high yield and quality harvest through fertigation, pruning an applying of GAP practices. Targeted extent was 7ac but during the year only 3 ac developed due to lack of time. One deep well was constructed, 856 mango plants were purchased and planted in the field.Chemical fertilizer needed for above mango plants were also purchased.

17. Home Gardening Promotion Program

This project was implemented in 14,784 villages covering all the districts throughout the country. Objective of the project was to select 20 women beneficiaries from one village and establish 295,680 sustainable home gardens at the end of the year 2016. Project was implemented through beneficiaries in both urban and rural areas. As an encouragement to begin the progam small pack of vegetable seeds and 5 fruit plants were provided free of chrage to the beneficiaries. During the year 1,021,766 number of fruit plants were distributed for 245,951 number of beneficiaries. Seed packs needed to distribute 200,000 beneficiaries were handed over to Department of Agrarian Development. Technical support for this program was provided by Agriculture Instructors (Provincial/Inter provincial) of the Department of Agriculture. Photoshop soft ware training

regarding landscaping of home garden was conducted for 55 Agriculture Instructors. Selection of beneficiaries was done by Agriculture Research & Production Assistants (ARPAs) attached to Department of Agrarian Development. During the year 14,750 number of "Sithamu" farm women societies were established. Sixty TV spots were telecasted to aware the general public about the program.

18. Promotion of Healthy foods

Objective of the project is make people aware about healthy food and food habits. Mass media programs were conducted to aware general public. During the year 3 TV programs, TV short messages were telecasted. Five live radio programs and short radio mesaages were broadcasted. Printed materials including the posters, banners, leaflets were produced to distribute among people.

EXTENSION ACTIVITIES OF INTER-PROVINCIAL AREAS

Six Inter-Provincial (IP) areas located in the commanding areas of major irrigation schemes are under the purview of the Extension and Training Centre of the central Department of Agriculture. Parts of the districts of Ampara, Anuradhapura, Hambanthota, Moneragala, Polonnaruwa and Kandy are demarcated as Inter-Provincial areas. Extension staff of the six inter provincial areas provide their services to farmers to enhance agricultural knowledge, improve skills and develop their attitudes towards the increase of National Food Production and uplift the living standards of farmers by increasing their income.

Total Paddy extents cultivated in IP areas during 2015/2016 Maha and 2016 Yala were 176,580 ha and 129,029 ha respectively. The cultivated extents were decreased in both seasons due to scarcity of irrigation water in the tanks. Special attention was given to increase the cultivated extents of Other Field Crops during the year. Mainly Maize, Green gram, Ground nut, Gingelly, Cowpea, Soy bean, Chilli, Finger millet, Black gram, Big onion and Red onion were cultivated in six Inter-Provincial areas.

Specific information and performances of each Inter-Provincial area are given below.

INTER-PROVINCIAL AREA - HAMBANTOTA

In Hambantota Inter Provincial (I/P) Area major crop cultivated is paddy and it covers the area of about 15,000 ha under major irrigation 1100 ha under minor irrigation and about 50 ha under rainfed conditions. The extent of uplands within Hambantota inter provincial area is about 39,546 ha where mainly cultivated low country vegetables and fruits such as Banana and Papaya. Lunugamwehera, Liyangastotota (Ridiyagama reservoir) and Samanala wewa are the major irrigation schemes that provide irrigation facilities for cultivation activities and from these, main two seasons Yala, Maha and after yala third season cultivation is practicing in most of the areas. Extension activities are conducting in 02 Districts (Hambantota and Rathnapura) 06 AGA divisions (Ambalantota, Hambantota, Tissamaharama, Lunugamwehera, Sooriyawewa and Balangoda) and 08 Agrarian Service Centers (Ambalantota, Lunama, Badagiriya, Weerawila, Yodakandiya, Beralihela and Kaltota, Maurapura). Two ADA Segments namely Walawa and Kirindioya and

Weerawila district training centre is functioning under Hambantota Inter provincial area.

Average paddy yield in this area is about 7.2 mt/ha. Vegetable and fruit cultivation contribute a lot to district production and there is an increasing trend for banana cultivation.

Progress

2015/16 Maha

During 2015/16 Maha season targeted extent of paddy cultivation was 16,100 ha. It included 14,852 ha under major irrigation, 1,473 ha of minor irrigation and 45 ha rain fed lands. Out of this target, cultivated extent under major irrigation and minor irrigation were 15,442 ha and 1,320ha respectively. Extent cultivated under rain fed was 21 ha. Total cultivated extent was 16,783 ha under all three irrigation systems. The average paddy yield under major, minor and rainfed irrigation schemes were 7.2 mt/ha, 6.9 mt/ha and 6.7 mt/ha respectively. These average yields exceeds the national average which is 4.2 mt/ha.

During 2015/16 Maha season targeted extents of OFC cultivation was 1568 ha. It included 107 ha of chilli, 79 ha of Maize,108 ha of Groundnut, 134 ha of Finger millet, 90 ha of Cowpea, 325 ha of Gingelly and 725 ha of Green gram. Achievements of the season were 158 ha of Chilli, 107 ha of Maize, 84 ha of Groundnut, 93 ha of Finger millet, 79 ha of Cowpea, 77 ha of Gingelly and 932 ha of Green gram in the upland cultivation . The extent of Green gram cultivated during 3rd season and fourth season were 6,300 ha and 810 ha respectively.

Yala 2016

Targeted extents of paddy under major, minor and rain-fed irrigation were 14,446 ha, 1366 ha, and 69 ha respectively during the season. This brought the total targeted extent to 15,881 ha where the total cultivated extent of paddy during Yala 2016 was 15,043 ha. It included 14,704 ha under major irrigation schemes, 324 ha under minor irrigation and 15 ha under rain-fed conditions. Because of the banana cultivation in some paddy lands, targeted extents were not achieved.

Total targeted extent of OFC during the season was 351 ha and it included 53 ha of Chilli, 21ha of Maize, 33ha of Groundnut, 75 ha of Finger millet, 68 ha of Cowpea, 66 ha of Gingelly and 35 ha of Green gram. Cultivated extents were 95 ha of Chilli, 151 ha of Maize, 32 ha of Groundnut, 7 ha of Finger millet, 41 ha of Cowpea, 8 ha of Gingelly and 6,309 ha of Green gram. Non availability of quality seeds of Cowpea is the main reason for not achieving the relevant targets. Green gram extents were exceeded the targets because of upland cultivation during Yala season and mid season cultivation after Yala.

In Year 2016 several special projects were implemented in the area and those were Organic manure promotional program in paddy cultivation, Rice production program, Third season Mungbean cultivation program, OFC (Chilli, Maize, Groundnut, Finger millet) cultivation program, Home garden cultivation program, Vegetable cultivation program and, Fruit village program under Ministry and DOA allocations. These activities were conducted other than Normal Extension and Production program in the district.

Special projects

Rice production program

Under this project 72 Soil samples were tested. 46 high yielding demonstrations, 31 training classes and 31 field days were conducted. Provided 36 tarpoline and 13,421 polysac bags under 50% farmer contribution to farmers. Average yield of these demonstrations was 7.12 mt/ha.

Organic manure production program

300 demonstrations, 31 training classes were conducted under this project. Average yield of these demonstration was 7.5 mt/ha.

Chilli cultivation program

By this project 24.3 kg of quality seeds were provided for new farmers under 50 % farmer contribution. 22 agro wells were constructed. 44 number o f ½ acre sprinkler systems and 14 number of ¼ acre sprinkler systems and 52 water pumps were distributed under 50% farmer contribution. 2 Chilli villages were established. Chilli grinding machine, a sealer machine and 1,013 number of nursery trays were distributed under 50% farmer contribution. To aware the farmers 86 training classes and 31 field days were conducted.

Third season Green gram cultivation program

By this project 109,167 kg of quality seeds were distributed under 50% farmer contribution in 2016 Yala season. 45 training classes and 20 field days were conducted during the season. Third season cultivation extent was 6,300 ha and Average yield of Green gram cultivation was 0.9 mt/ha.

Maize cultivation program

Good quality seeds were distributed among farmers to popularize the Maize cultivation in paddy lands. These seeds were provided under 50% farmer contribution and amount of seeds distributed were 1650 kg. 61 training classes and 12 field days were conducted under this project.

Finger millet cultivation program

Provided 600 kg of quality seeds under 50% farmer contribution and conducted 10 training classes.

Groundnut cultivation program

Quality seeds and sprinkler systems were supplied under 50% farmer contribution by this project. Amount of seeds provided to farmers is 1989 kg and number of sprinkler systems given were 3 and it included two ½ acre sprinkler systems and one ¼ acre sprinkler system. Conducted 28 training classes to farmers.

Home Gardening Promotion Program

Eight Training programs were conducted. Established 49 farm Women societies with 989 participants. Provided 4 water pumps under 50% farmer contribution.

Fruit village program

Provided 30,205 fruit plants free of charge and established 20 fruit villages. Conducted 4 officer training programs and 158 farmers were participated.

INTER-PROVINCIAL AREA - KANDY

Deputy Director of Agriculture (Inter Province) Kandy Area Includes Five Divisional Secretariat Divisions as Minipe, Wilgamuwa, Mahiyanganaya, Rideemaliyadda and Kandaketiya which belong to Kandy,

lowland areas are irrigated by the Minipe anicut. In Mahiyangana Divisional Secretaria lowlands are irrigated by Sorabora, Dambarawa and Mapakadawewa reservoirs. In Rideemaliyadda Divisional Secretariat lowlands are irrigated by Nagadeepa reservoirs.In Kandaketiya Divisional Secretariat lowland areas irrigated by Badulu oya and Bathmedilla anicuts. During Maha season paddy is the main crop grown in low lands and other field crops were cultivated in uplands and also small scale in well irrigated lowlands.

Progress

2015/16 Maha

Paddy

During 2015/16 Maha season, Paddy cultivation target area was 13,974 ha. This area consisted of 11,917 ha under major irrigation and 2057 ha under rain fed conditions. During the season, cultivated paddy extent was 13,827 ha. It included 11,784 ha under major irrigation and 2,043 ha under rainfed. The progress was reduced due to several farmers cultivated other field crosp in well irrigated lowlands in latter parts of the Maha season. The average yield of major irrigated paddy cultivation in 2015/16 Maha season was 5.1 mt /ha.

Other Field Crops

During 2015/16 Maha season OFC cultivation target was 640 ha but the achievement was only 583 ha. The Maize cultivation target extent was 400 ha and cultivated extent was 420 ha. Targeted extent of Green gram was 26 ha and achievement was 21 ha. Finger millet cultivation target was 46 ha and cultivated land extent was 49 ha.

Special Programs

Under the Paddy production program, Yaya 02 technical package was implemented in 54 yaya covering 639 ha with 885 farmers. The main objective of this program was reduction of agro chemical usage. To achieve main objective, deep ploughing during land preparation, application of organic fertilizer, mechanization, Parachute method for transplanting, usage of efficient water management system and crop diversification activities were practiced. Under this program average yield of direct sowing was 6.4 mt/ha, transplanting using Parachute method was 6.7 mt/ha and Mechanical transplanting 6.2 mt/ha.

Seed paddy production program was implemented and targeted Certified seed paddy production extent was 66 ha. Achivement was 94 ha and 1,309 Farmers participated for the pogram.

Off-Season big Onion cultivation program implemented in 10 ha.

2016 Yala

Paddy

During 2016 Yala season Paddy cultivation target was 8,221 ha and achievement was 9,501 ha. The progress was increased than target due to rain at the beginning of the season. The average yield of this season was 4.8 mt/ha.

OFC

In 2016 Yala season OFC cultivation target was 3,518 ha. Achieved progress was 2,267 ha under the irrigated paddy lands. This low achievement was due to rain at the beginning of the season. Because of the rain received at the beginning of the season the initial decision

to supply water for 50% of the land area which was taken at the Nagadeepa irrigation system cultivation meeting was changed and supplied water for total land extent. The Maize cultivation target was 2,505 ha and 1,862 ha of progress achieved. Soya cultivation target was 100 ha and Soya cultivation extent was reduced due to rain and scarcity of seeds at correct time. In this season Green gram cultivation target was 635 ha and achieved progress was 206 ha. The main reason for reduction of Green gram extent was low market price due to the reduction of Tax by Budget 2015.

Special Programs

- Under The Seed Paddy production program targeted extent of certified Seed Paddy was 100 ha and achievement was 116 ha. Self Seed Paddy production program was conducted with the participation of 735 farmers.
- Certified Groundnut Seed Production program was implented in 6 ha.
- Certified Soya seed production program was implemented in 5 ha.
- 24 Fruit Villages were established.
- During 3rd season Green gram was cultivated in 22 ha.

INTER-PROVINCIAL AREA - AMPARA

The Deputy Director of Agriculture (Inter-Provincial) office, Ampara consists of four agricultural administrative segments, viz. Uhana, Damana, Adalchchena and Sammanthurai. These four segments include 25 Agrarian Service Centres, 85 Agriculture Instructor ranges, 16 Divisional Secretariet divisions and 430 Grama Niladari divisions.

Main irrigated water source in Ampara district is Senanayake Samudraya at Iginiyagala. It has a capacity of 770,000 acre feet and provide water for 10 small tanks in Galoya left bank and right bank colonies. In addition to that there are 13 other small tanks which strongly support paddy cultivation in Ampara district.

Progress

15/16 Maha

Paddy

During 2015/16 Maha season targeted extent of paddy cultivation was 68, 225 ha which includes 54, 250 ha of major irrigation, 4, 400 ha minor irrigation and 9, 575 ha of rain fed lands. Out of this target, 54,953 ha and and 4,455 ha were cultivated under major and minor irrigtion respectively. Under rainfed conditions 10,206 ha were cultivated. This shows the total cultivated extent was 69,614 ha under all three irrigation systems. This shows the cultivated extent was higher than the target. The reasons for this increased extent were usage of sugar cane lands for paddy cultivation due to farmers' interest to paddy cultivation. The average paddy yield under major, minor and rainfed irrigation schemes were 6.5 mt/ha, 4.5mt/ha and 3.5mt/ha respectively.

OFC

During 2015/16 Maha season targeted extents of OFC cultivation was 5213 ha. It included 350 ha of Chilli, 3819 ha of Maize, 750 ha of Groundnut, 150 ha of Cowpea and 144 ha of Green gram. Achievements of the OFC extents were 311 ha of Chilli, 3,114 ha of Maize, 464 ha of Groundnut, 95 ha of Cowpea and 120 ha of Green gram. This brought the total cultivated extent of OFC during the season to 1,404 ha. Reasons for not achieving

the targets are water scarcity and lack of quality seeds.

Yala 2016

Paddy

Targeted extents of paddy under major and minor irrigation were 52,650 ha, 2741 ha, This brought the total targeted extent to 55,391 ha where the total cultivated extent of paddy during Yala 2016 was 55,320 ha. It included 52,823 ha under major irrigation schemes, 2497 ha under minor irrigation.

OFC

Total targeted extent of OFC during the season was 712 ha and it included 158 ha of Chilli, 103 ha of Maize, 245 ha of Groundnut, 101 ha of Cowpea, and 105ha of Green gram. Cultivated extents were 156 ha of Chilli, 192 ha of Maize, 244 ha of Groundnut, 333 ha of Cowpea, 413 ha of Green gram. Total achievement of the OFC during the season was 1,338 ha. Cultivated extent is higher than targeted. Nationl food production program ineventions helped to motivate farmers to increase the cultivated land extent of OFC.

Highlights

Fruit village program implemented in the area during this year and number of fruit villages established are given in Table 3.1.2.

Table 3.1.2: Number of Fruit villages established in Ampara I/P area

Fruit crop	Number of villages
Pomegranate	4
Orange	22
Mango	14
Banana	3
Anona	3
Total	**46**

INTER-PROVINCIAL AREA - MONARAGALA

Inter-Provincial area of Monaragala includes Siyambalanduwa, Okkampitiya, Ethimale and Thelulla Agrarian Service Centre divisions. Muthukandiya, Ethimale, Kotiyagala, Saddhathissa, Handapanagala tanks and Kumbukkan Oya Amuna are Major irrigation systems of Monaragala Inter-Provincial area. Paddy is the main crop grown and Maize is the second largest crop cultivated in the area. Total extent of the paddy cultivation is about 6,290 ha with major, minor and rainfed irrigation systems. Off season big Onion cultivation program, intermediate season green gram cultivation program, Organic fertilizer production program, Moneragala district development program with European union and OFC production programs under Ministry of Agriculture funds are special activities conducted by the extension staff of Moneragala Inter Provincial office.

Progress

2015/16 Maha

Paddy

During 2015/16 Maha season targeted extent of paddy cultivation was 12,787 ha which included 2,821 ha of major irrigation, 2,231 ha minor irrigation and 7,735 ha of rain fed lands.The targets under major and minor irrigation were achieved during the season. Cultivated extent under rainfed condition is 7,838 ha and it exceeded the targets due to good weather conditions. This shows the total cultivated extent was 12,890 ha under all three irrigation systems. Production obtained from that extent was 51,024 mt. The average paddy yield under major, minor and rainfed irrigation

schemes were 5.4 mt/ha, 4.8 mt/ha and 3.2 mt/ha respectively.

OFC

Cultivated extents of other Field Crops during the season are shown in Table 3.1.3.

Table 3.1.3: Cultivated extents of other Field Crops during 2015/16 Maha in Moneragala I/P area

Crop	Target extent (ha)	Progress (ha)
Chilli	168	102
Maize	9296	9960
Groundnut	490	649
Finger millet	50	59
Cowpea	100	92.5
Red onion	15	9.8
Gingelly	20	20
Green gram	93	32
Blackgram	294	98

Vegetables

Cultivated extents and production of Vegetables in Monaragala I/P area during 2015/16 Maha season is shown in Table 3.1.4.

Table 3.1.4: Cultivated extents and production of Vegetables in Monaragala I/P area during 2015/16 Maha

Crop	Target (ha)	Progress (ha)
Pumpkin	113	129.5
Brinjal	62.7	56
Tomato	35.2	40
Okra	80.6	74
Cucumber	47.8	35
Bitter gourd	25.2	17.7
Ash Pumpkin	19	26
Long bean	60	44
Luffa	25.8	18
Capsicum	10.2	14.3
Kekiri	16.2	11

Cultivated extent decreasesd due to pests and diseases and lack of quality seeds.

Fruits

Progress of Fruit cultivation program is shown in Table 3.1.5.

Table 3.1.5: Cultivated extents and production of fruits in I/P Moneragala during 2015/16 Maha season

Crop	Target (ha)		Progress (ha)	
	Commercial	Home Garden	Commercial	Home Garden
Banana	66	33	93.5	28.5
Papaw	23	03	40.5	7.5
Orange	7.5	02	09	1.1
Lime	-	07	05	02
Mango	34	08	33.7	6.5
Sweet melon	22	-	64	02
Guava	02	-	02	0.1

2016 Yala

Paddy

During 2016Yala season, targeted extent of paddy cultivation was 2,406 ha which includes 1,090 ha under major irrigation and 1,316 ha under minor irrigation. Cultivated extents were 1,091 ha under major irrigation and 953 ha under minor irrigayion. This shows the total cultivated extent was 2,044 ha under two

irrigation systems. Production obtained from this extent was 10,466 mt.

OFC

Cultivated extents of other Field Crops during the seasonare shown in Table 3.1.6.

Table 3.1.6: Cultivated extents of other Field Crops during 2016 Yala in Moneragala I/P area

Crop	Target (ha)	Progress (ha)
Chilli	25	24
Maize	13	37
Groundnut	140	100
Soybean	9.4	11
Cowpea	215	138
Red onion	15	9.8
Gingelly	52	57
Green gram	200	257
Blackgram	8	13

Vegetables

Table 3.1.7: Cultivated extents and production of Vegetables in Monaragala I/P area during 2016 Yala

Crop	Target (ha)	Progress (ha)
Pumpkin	54	53
Brinjal	39	38
Tomato	16	6
Okra	51	42
Cucumber	8	19
Bitter gourd	10	-
Ash Pumpkin	15	926
Long bean	60	22,544
Luffa	9	05
Capsicum	18	8
Kekiri		3

Fruits

Progress of Fruit cultivation program is shown in Table 3.1.8.

Table 3.1.8: Cultivated extents and production of fruits in I/P Moneragala during 2016 Yala season

Crop	Target (ha)		Progress (ha)	
	Commercial	Home Garden	Commercial	Home Garden
Banana	14	02	18	5.7
Papaya	07	0.3	11	2.6
Orange	03	0.2	1.5	0.55
Lime	-		02	02
Mango	03	0.2	04	01
Sweet melon	24	3.5	85	43.5
Guava	01	-	0.4	0.1

INTER-PROVINCIAL AREA - ANURADHAPURA

Anuradapura inter provincial area covered 12 major irrigation systems in Anuradapura, Kurunegala, Matale and Puttalam districts. There are 48 Agriculture Instructor divisions in the area.

Progress

2015/16 Maha

Paddy

During 2015/16 Maha season targeted extent of paddy cultivation was 32,682 ha which included 24,277 ha of major irrigation, 5,622 ha minor irrigation and 2,783ha of rain fed lands. Cultivated extents were 23,269 ha, 4,222 ha and 2,806 ha under major, minor and rainfed irrigation conditions respectively. Total cultivated extent under all three irrigation systems were 30,298 ha. Production obtained from that extent was 160,026 mt. The average paddy yield under major, minor and rainfed irrigation schemes were 5.5 mt/ha, 5.1mt/ha and 4.8 mt/ha respectively.

OFC

Gram, Groundnut, Finger millet, Gingelly, Soybean. Off season big onion cultivation program, Intermediate Green gram cultivation program are special activities conducted by the extension staff of Anuradhapura Inter provincial office.

During 2015/16 Maha season targeted extents of OFC cultivation was 10,721 ha.It included 631 ha of Chilli,100 ha of big Onion, 144 ha of Cowpea, 6,884 ha of Maize, 100 ha of Groundnut, 70 ha of Soybean, 212 ha of Green gram and 2,580 ha of Black gram. Achievements of the OFC extents were 321 ha of Chilli, 117 ha of big Onion, 87 ha of Cowpea, 4,391 ha of Maize, 109 ha of Groundnut, 21 ha of Soybean, 117 ha of Green gram and 1,323 ha of Blackgram. This brought the total cultivated extent of OFC during the season to 6,486 ha.

Other than above activities 900 kg of Big onion true seed yield was obtained from 18,670 kg of vernalized seed bulbs. Off season big onion cultivation program, intermediate Green gram cultivation program are special activities conducted by the extension staff of Anuradhapura Inter Provincial office during the season.

Fruit cultivation

Papaya, Banana, orange, Mango and Water melon were the main fruit crops cultivated in the area. Targeted extent of fruit cultivation was 91 ha and achieved extent was 143 ha.

Vegetable cultivation

Targets and progress of the mainly cultivated vegetable crops in the area are given in the Table 3.1.9.

Table 3.1.9: Targets and progress of the mainly cultivated vegetable crops in Anuradhapura I/P are during 2015/16 Maha season

Vegetable crop	2015/16 Maha	
	Target (ha)	Progress (ha)
Pumpkin	1041	834
Brinjal	164	205
Okra	81	105
Cucumber	56	65
Bitter gourd	40	73
Lufa	45	61
Snake gourd	79	50

2016 Yala

Paddy

During 2016 Yala season targeted extent of paddy cultivation was 20,212 ha which is under major irrigation. Cultivated extents were16,128 ha and 1,043 ha under major and minor irrigarion conditions respectively. Total cultivated land area was17,171ha. Production

obtained from that extent was 94,023 mt. The average paddy yield under major, minor and rainfed irrigation schemes were 5.5 mt/ha, 5.1.mt/ha and 4.8mt/ha respectively.

Other Field Crop program

During 2016 Yala season targeted extents of OFC cultivation was 6,612 ha. It included 425 ha of Chilli, 400 ha of Maize, 100 ha of Groundnut, 1,600 ha of Soybean , 400 ha of Green gram, 30 ha of Black gram, 37 ha of Cowpea 20 ha of Finger millet, 3,000 ha of Gingelly and 600 ha big Onion. Achievements of the OFC extents were 210 ha of Chilli, 794 ha of Maize, 30 ha of Groundnut, 1,482 ha of Soybean, 1.8 ha of Finger millet, 36 ha of Cowpea, 80 ha of Green gram and 46.1 ha of Black gram and 158.1ha big Onion. This brought the total cultivated extent of OFC during the season to 5828.05 ha.

During third season, cultivated extent of green gram was 828 ha. With the aim of producing big Onion trues seeds 2,0028 kg of bulbs were vernalized and produced 1,118 kg of true seeds for 78 farmers.

Fruits and vegetables

Eighteen number of GAP demonstrations on vegetable cultivation carried out with 43 farmers. Special wood apple demonstration was established covering an area of 15 ha.

INTER-PROVINCIAL AREA - POLONNARUWA

Polonnaruwa district land extent is 3, 33,000 ha and it is divided as 1,96,000 ha for DOA (Inter Provincial) and 1, 37,800 ha for Mahaveli Authority. There are five divisional secretariats offices in the IP area such as Medirigiriya, Hingurakgoda, Lankapura, Thamankaduwa and Elahera. The major irrigation schemes are Parakrama Samudra, Kaudulla, Minneriya and Girithale and also many minor irrigation schemes. IP area has 3 segments, 8 Agrarian Service Centers and 35 Agriculture Instructor ranges. The arable land extent in IP area is 34,840ha. 46, 092 farm families are involved in agriculture. Paddy is the main crop grown in this locality and Groundnut and Maize extents have increased significantly in past five years.

Progress

2015/16 Maha

Paddy

During 2015/16 Maha season targeted extent of paddy cultivation was 34,421 ha which included 26,160 ha of major irrigation, 6252 ha minor irrigation and 2,009 ha of rain fed lands. Cultivated extents were 26,149ha, 6,035ha and 1,954 ha under major, minor and rainfed irrigation conditions respectively. Total cultivated extent under all three irrigation systems were 34,138 ha. Production obtained from that extent was 199,856 mt. The average paddy yield under major, minor and rainfed irrigation schemes were 6 mt/ha, 5.5 mt/ha and 5 mt/ha respectively.

OFC

During 2015/16 Maha season targeted extents of OFC cultivation was 710 ha. It included 140 ha of Chilli, 50 ha of Cowpea, 250 ha of Maize, 150 ha of Groundnut and 50 ha of Green gram, Finger millet 50 ha and Gingelly 20 ha. Achievements of the OFC extents were 199 ha of Chilli, 50 ha of Cowpea, 377 ha of Maize, 123 ha of Groundnut, 49 ha of Green gram and 33 ha of Finger millet and 24 ha of

Gingelly. This brought the total cultivated extent of OFC during the season to 855 ha.

Fruits

There is a continuous increase in Banana cultivation in the IP area. Newly cultivated extents of fruit crops in this year were 93 ha of Banana, 57 ha of Mango and 90 ha of Papaya. Under National Food Production Program, plants for 139 fruit villages were distributed to the farmers. In both seasons 103 Training classes were conducted on fruit fly control.

Vegetables

During the season 30 ha of Capsicum, 17 ha of Tomato,44 ha of Okra, 40 ha of long Bean and 41ha of Pumpkin were cultivated. 131 training classes on vegetable cultivation have been conducted during the season. Other than that the extent of 49 ha were cultivated with vegetables under agro wells.

Special projects

During this year Paddy special project under National Food Production Program (NFPP) was implemented in the area and 140 'yayas' were established. These 'yayas' continued throughout both seasons successfully. This program was started with promoting land preparation with rain water and followed by implementation of demonstrations in each 'yaya' such as deep ploughing, usage of leaf colour charts, IPM, IPNS, mechanization etc.

Encouragement of vegetable and some OFC cultivation on bunds in paddy fields has led to earn Rs. 943,320 for 125 farmers during the Maha season. Under NFPP all the farmers in the district received seed paddy and parachute trays for self seed paddy production in 2016 Yala season. To facilitate better use of machinery in paddy fields, plot size of paddy fields were increased in 520 ha extent under 'Rajarata Nawodaya' project. Overall 1401 training classes and 262 field days were conducted on paddy cultivation.

Farmers' interests in bee keeping was increased with the bee keeping villages project (Bingu Gammana) in Polonnaruwa district. 500 and 890 home gardens were established under NFPP and MRBP respectively. 330 training classes on home garden were conducted.

With the objective of giving knowledge about local food promotion, kitchen management, food and nutrition and entrepreneurship development 147 training programs were conducted. One 'Hela bojun' sales centre was established in the area to promote local food among the community by providing entrepreneurship to 30 farm women.

Highlights

Cultivation of OFC in paddy fields was also promoted in this year. Total extent of paddy lands converted to OFC was 144 ha in Maha and 455 ha in Yala. In uplands 285 ha and 360 ha were cultivated with OFC during Maha and Yala seasons respectively. In both seasons 753 training classes and 168 field days have been conducted. Chilli cultivation under 'Rajarata Nawodaya' dry season promotion project has led to be a profitable venture for farmers who used DOA recommendations.

2016 Yala

Paddy

During 2016 Yala season targeted extent of paddy cultivation under major and minor irrigation were 25,220 ha and 4,780 ha

respectively. Cultivated extents were 25,220 ha under major and 4,730 ha under minor irrigarion conditions. Total cultivated land area was 29,950 ha. Production obtained from that extent was 177,335 mt .The average paddy yield under major, minor and rainfed irrigation schemes were 6 mt/ha, 5.5 mt/ha and 5 mt/ha respectively.

Other Field Crop program

During 2016 yala season targeted extents of OFC cultivation was 1,635 ha. It included 300 ha of Chilli, 300 ha of Maize, 80 ha of Groundnut, 650 ha of Green gram, 15 ha of Black gram, 100 ha of Cowpea, 10 ha of Finger millet, 15 ha of Gingelly, 150 ha big Onion and 15 ha red Onion. Achievements of the OFC extents were 261 ha of Chilli,199 ha of Maize, 107 ha of Groundnut, 12 ha of Finger millet, 55 ha of Cowpea, 245 ha of Green gram and 22 ha of Black gram and big Onion 141 ha. This brought the total cultivated extent of OFC during the season to 5,828.05 ha.

Fruits and vegetables

Eighteen number of GAP demonstrations on vegetable cultivation carried out with 43 farmers. Special wood apple demonstration was established covering the area of 15 ha.

IN-SERVICE TRAINING INSTITUTE - GANNORUWA

In-Service Training Institute, Gannoruwa, is the main agricultural training institute at national level which is responsible for keep abreast with information, innovations, technologies and develop skills in the extension staff of the DOA. To accomplish this, extension staff of DOA is trained to improve their knowledge and skills including communication skills. The systematic and comprehensive training of field staff at the In-service Training Institute helps to improve their performance.

Number of training programs targeted and conducted during the year were shown in table 3.1.10.

Table 3.1.10: Number of training programs targeted and conducted during 2016 at ISTI, Gannoruwa

Training	Annual Target		Progress	
	No. of Trainings	Man days	No. of Trainings	Man days
Training for Department of Agriculture Officers	62	5,880	183	10,193
Training for other Institutes	14	920	15	1,586
Training for Farmers, Students & Others	44	2,640	104	11,318
Workshop/ Seminar/ Meeting/ Discussion (Department of Agriculture & Other Departments)	67	3,350	75	5,683
ASDA Conference (Department of Agriculture)	1	2,000	3	2,462
Total	**188**	**14,790**	**296**	**31,242**

IN-SERVICE TRAINING INSTITUTE – ANGUNAKOLAPELLESSA

The mission of ISTI, Angunakolapelessa is to keep the field extension staff updated on new technologies to raise their professional competence and educating them continuously for changing conditions in agricultural sector. This Institute offers In-service training for officers in Agricultural sector in Galle, Matara, Hambantota Districts and Hambantota Inter Provincial area. Induction training, refresher training, pre-seasonal training are the common types of trainings usually conducted. In addition to above trainings, field demonstrations carried out in ISTI premises are also helpful to popularize modern agricultural technologies. Food technology trainings for officers and small to medium scale entrepreneurs were carried out by Post Harvest & Food Processing Unit of the institute. Apart from that, ISTI provides advisory services on plant protection in Crop clinics for farmers. In addition to that, Plant nursery development training course is (NVQ level 4) conducted at ISTI Angunakolapelessa.

Progress

Total number of training programs conducted in 2016 were 73 (3,809 mandays). It included 36 traning programs for DOA officers (2,306 man days), 12 for other Institutional officers (1,721 man days) 08 for entrepreneurship development/ Vocational training programs (305 man days), 01 for arm machinery training (20 man days) , 11 field training programs for students/schools, technical colleges, Officers & Others (321 man days) and 01 out door training program (30 man days). Also 04 numbers of workshops / seminars / meetings / discussions, (206 man days) were conducted.

Crop production (Paddy, Fruit cultivation, Vegetable & root crop, OFC, Floriculture, Plant protection), Human resource development, Post harvest technology/ Food technology, Pre seasonal trainings and Other (Young Farmer Club,Bee Keeping) are the subject areas covered by Officer trainings conducted at the Institution.

IN-SERVICE TRAINING INSTITUTE – HANSAYAPALAMA, ARALAGANWILA

The In-Service Training Institute, Aralaganwila is sitauated in in Mahaweli block B which is conducting training programs for extension staff of Sri Lanka Mahaweli Authority, Department of Agriculture as well as other government and non-governmental officers. The institute conducts the course of training field Assistant in Agriculture (NVQ 4) for school leavers.

Progess

In the year 2016, NVQ level 4 Field assistant training course was conducted for 13 School leavers. 02 preparatory meetings for MASL preseasonal taining were conducted.

FARM MECHANIZATION TRAINING CENTRE

Farm Mechanization Training Centre (FMTC) is the sole national level training institute for farm machinery in Sri Lanka. The institute was established in 1971 with collaboration of West German federal government and the Sri Lankan government. The institute is situated in

Puliyankulama, Anuradhapura. Total land extend of the institute is about seventeen (17) hectares which covers with paddy, coconut, fruits, vegetables, driving track, training field and other utility buildings. FMTC can provide food and lodging facilities for about 50 trainees.

Vision of the institute is to become the center of excellence in training on farm mechanization in Sri Lanka.

Mission of the institute is Creating skillful farming community with appropriate mechanization for sustainable development in Agriculture.

Training mandate of the FMTC mainly focused on following aspects.

Operation and maintenance courses

- Vocational Training on Operation and maintenance of four wheel tractors - 10 days
- Operation and maintenance of four wheel tractors - 5 days
- Operation and maintenance of two wheel tractors - 5 days
- Operation and maintenance of water pumps -3 days
- Operation and maintenance of sprayers -2 days
- Operation and maintenance of harvesting , threshing machine and combine harvesters -2 days
- Operation and maintenance of Power trans Planter -3 days

Repair courses

- Repair of two wheel tractor (K75) engine and transmission system -10 days
- Repair of water pumps -5 days
- Repair of sprayers -5 days

Micro irrigation courses

- Micro irrigation introductory course - 3days
- Application and Designing of Micro irrigation for commercial Agriculture - 5 days

Other courses

- Agricultural hand tools
- Home gardening

Target groups as follows,

- Officers from Department of Agriculture and Provincial Departments of Agriculture.
- Officers from the other institutes
- Farmers
- Students from schools/ universitie/ Agriculture Schools/ Technical colleges

Table 3.1.11: Number of training programs conducted during 2016 at FMTC, Anuradhapura

Program	No. of Programs	No. of Man days
Operation and maintenance of farm machinery	29	3061
Operation and maintenance of four wheel tractors	15	1845
Operation and maintenance of sprayers	02	80
Operation and maintenance of two wheel/four wheel tractors	06	1172
Operation and maintenance of combine harvesters	04	244
Micro irrigation course	03	257

SRI LANKA SCHOOL OF AGRICULTURE - ANURADHAPURA

Sri Lanka School of Agriculture, Anuradhapura, has been established on 2nd May 1994 as a training institute for conducting two year Agriculture Diploma program. After that the school converted to special training institute in 2002 and delivered large number of short term training programs for government officers, farmers and school children etc.

During the year final assessment for NVQ 3/4 course was conducted by TVEC and all student (2015/16 Batch) were qualified. In May 2016, NVQ 5 – National Diploma in Agricultural Production Technology Course was started for students who have G.C.E A/L qualifications.The number of trainees enrolled were 37. This course comprises one year institutional training and 6 months on the Job training.

SRI LANKA SCHOOL OF AGRICULTURE - WARIYAPOLA

Sri Lanka School of Agriculture, Wariyapola, is institutes which offer national Diploma in Agriculture Production Technology (NVQ level 5). Thirty eight female students are studying the course. All learning facilities and hostel facilities are provided by the institute.

Demonstration field is well maintained by the students for their field practicals and paddy, vegetable, fruits and other field crops are supplied from this field for the students' consumption and the excess production is sold by the sales outlet.

Six months Plant Nursery Development Assistant course (NVQ level 3 and 4) is also conducted by the institute and fifteen students were enrolled for the course.Bee development activities were conducted by bee keeping unit established within the premises of school. Services provided by this unit were conducting training classes, demonstrations, supplying bee colonies and bee boxes.

Agricultural knowledge dissemination through filed visits, field demonstration, radio and television programs by the officers especially under Good Agricultural Practices Project is also done by the institute.

SRI LANKA SCHOOL OF AGRICULTURE - LABUDUWA

Sri Lanka School of Agriculture, Labuduwa was started in 1994 to conduct two year Agriculture Diploma course. This course was conducted in the institution up to year 2000. Later one year practical Agriculture training course was conducted for Agriculture Research and Production Assistant in Department of Agrarian Development. Around 350 ARPA's were trained from 2005 to 2013. NVQ 3/4 Level 'Edible landscaping and urban agriculture' course was started for school leavers during 2014 and it continued in 2016. In 2015 NVQ level 5 National Diploma in Agricultural Production Technology course was started in the school. Conducting short term training programs for officers, farmers and school students is another function of the school. Land area of the school is maintained as a demonstration field for these trainees.

Progress

Thirty eight (38) students who followed the NVQ level 5 National Diploma in Agricultural Production Technology course completed the

institutional training and joined for on job training (OJT). New batch which comprises 38 students were recruited to follow the course during 2016.

Sixteen (16) students who followed the NVQ 3-4 level Edible landscaping and urban agriculture course were completed their institutional training and started on job training.

Highlights

- To mark the centenary celebrations of the schools of agriculture an exhibition was held at the school premises.
- "Dakshina Krushi Navodaya" exhibition also held in the school premises.
- Two Television programs were produced.
- A new Buddha statue with a shrine room was built in the school premises with the assistance of School Welfare Society.

HORTICULTURAL CROP TRAINING & DEVELOPMENT INSTITUTE & SCHOOL OF AGRICULTURE - BIBILE

Horticultural crops training and development institute is situated in Monaragala district, Bibile AGA division . It was established in 1st of April 2003 by joining the Sri Lanka School of Agriculture Bibile and research farm HORDI Bibile.

Activities of Sri Lanka school of agriculture re-started in this institute in 2015 to conduct one year NVQ level 5 Nationl Diploma in Agriculture Production & Technology course .

The main objectives of the institute are as follows,

- Introduction of new technology on horticulture.
- Production of different fruit plants with new technologies.
- Functioning the activities of Sri Lanka school of agriculture Bibile.
- Conducting NVQ 3/4 level training course- Nursery Assistant program
- Conducting training programs with new technology – for Government officers, NGO officers, farmers and students (Schools/Universities).
- Clone conservation
- Maintaining training and production oriented demonstration field.
- Field experiment on new recommendation.

Summary of the training progress in 2016 is given in Table 3.1.12.

Table 3.1.12: Number of training programs conducted in HTDI Bibile during 2016

Type of Training	Number of Training programs		Number of Man Days	
	Target	Progress	Target	Progress
Officer Training (DOA & PDOA Staff)	8	01	200	28
Officer Training (Other Institutional Staff)	8	02	240	27
Farmer Training	40	07	1000	190
Field Training	12	05	600	269
Total	**68**	**15**	**2040**	**514**

Targeted programs could not be conducted due to scarecity of training officers.

Other than the above training 12 trainees followed NVQ ¾ level nursery assistant course and 46 students followed NVQ level 5 Agriculture Production & Technology course. 65,000 budded fruit plants were produced under the planting material production program.

Progress of the funds received from special projects

- National bee keeping program funded by MOA - To increase the number of bee colonies in the institution 25 stands were constructed to establish new bee colonies.
- GAP project – Establish ½ ac TOM EJC Mango plantation and ¼ ac of Guava
- Development of infrastructure facilities of planting material production – One poly tunnel was repaired , one water pump and 5 water tanks were purchased.

DISTRICT AGRICULTURE TRAINING CENTRE - WEERAVILA

District Agriculture Training Center, Weerawila is responsible for implementing training activities to educate and uplift the agriculture knowledge of farming community, school children as well as Officers of DOA, PDOA, Other Government and Non Government Organizations. A one year NVQ 3/4 level training program was started in 2015 for school leavers who had completed the G.C.E (O/L). This program consists of six months institutional and six month on the job training (OJT) period.

Twenty participants who enrolled for this training in 2015 were completed their on the Job training training in 2016. Another group recruited in 2016 and it comprises 12 participants and they completed their institutional training during the year and started the OJT. After that again 18 trainees were recruited as 2nd batch in 2016 and they followed their institutional traning during second half of the year.

Other than the above training program, Officer and farmer training programs were conducted by the trainimg center. Summary of the training progress in 2016 is given in the table 3.1.13.

Table 3.1.13: Number of training programs conducted in DATC,Weerawila

Type of Training	Number of Training programs		Number of of Man Days	
	Target	Progress	Target	Progress
Officer Training (DOA & PDOA Staff)	04	01	160	40
Officer Training (Other Institutional Staff)		01		44
Farmer Training	34	08	1020	211
Field Training	15	02	90	30
Workshop, Seminar/ Meeting & Discussion	12	100	09	244

DISTRICT AGRICULTURE TRAINING CENTRE - WAVINNA

District Agriculture Training Centre, Wavinna is located in Ampara district in a Coconut cultivation colony. This institute provides trainings on Agriculture know-how for farmers, Officers, School students and others.

Training progress of the Centre is shown in table.

Table 3.1.14: Number of training programs targeted and conducted at DATC, Ampara -2016

Main Activities	Target		Progress	
	No. of training	Man days	No. of training	Man days
Officer training program DOA	25	525	15	340
Officer training program other institutional staff	08	200	06	178
Famer training program	16	380	16	260
Field training program	40	900	42	680
Workshop	22	510	16	320
Outdoor training activities	18	370	16	320
Total	**129**	**2,885**	**111**	**2,098**

DISTRICT AGRICULTURE TRAINING CENTRE - POLONNARUWA

Polonnaruwa District Agriculture Training center locate in Thamankaduwa Divisional secretariat and near Kaduruwela city. This unit stand as a model farm and as an Agriculture Training center. Cultivated area is about 4.5ac .The model farm has cultivated with paddy, OFC, vegetables, fruits and other crops (Coconut) under Department recommendations. It provides technical knowledge and methods of cultivating of each crops for farmers and also provides knowledge about model Home garden, bee keeping and mushroom cultivation.

During the year 2016, a total of 477 training programs were undertaken (4,083 man days) and this included 19 programs for officers (666 man days) and 24 programs for farmers (447 man days), 33 out door training programs (944 man days) and 401 field training programs for students (2,026 man days) .

SCHOOL OF AGRICULTURE - PALAMUNA.

This School of Agriculture was started on 6th of April, 2015 by converting DATC Palamunai as the School of Agriculture. Because of the limited space in one building and ¾ ac of cultivation land, adjacent 1 ac land was obtained for the cultivation purpose. Thereafter, Vidatha Resource center was obtained to function as the administrative building and finally another adjacent one acre land also occupied for the cultivation practices.

Ceremonial opening of the school of Agriculture, Palamunai comprised of an exhibition and a field day of National Food Production Program. Student registration program for the 2nd batch, cultural event and farmers' week celebration are the special event

occurred during the year with the participation of students.

Agro well, drinking well, and workshop were newly constructed to make the feasible environment to the students and staffs.

DISTRICT AGRICULTURE TRAINING CENTRE - ADDALACHCHENAI

The District Agricultural Training Centre, Palamuna was shifted to ADA office of Addalachchnenai in 2015 due to the commencement of school of Agriculture Palamuna in the DATC premises. With the aim of improving agricultural knowledge with practical aspects of the farmers, school children, teachers and other officers in the area, training progrms are conducted by the training center.

During the year, land areaof DATC is developed as a model farm to provide the knowledge of good agricultural practices to the farmers in the area under the GAP program. Vegetables and other field crops are cultivated in the field successfully. In addition, cultivation area is continuously maintained during Yala and Maha seasons.

During the year medical camp was organized by the staff of DATC to aware about Non-Infectional diseases.

Table 3.1.15: Number of training programs conducted in DATC, Addalachchenai-2016

Activity	No. of Training programs		No. of Man days	
	Target	Progress	Target	Progress
Officer Training (DOA & PDOA)	14	9	700	336
Officer Training (Other institutes)	2	2	80	71
Farmer training classes	13	10	430	442
Field training progrm (Students & farmers)	10	5	240	134
Workshops / seminars /meetings /discussions	2	2	80	110
Crop clinics	2	1	150	104

SCHOOL OF AGRICULTURE - PARANTHAN

Sri Lanka school of Agriculture, Paranthan which was established in 2016 is located in Kilinochchi district. The school is providing good opportunity to get National Diploma in Agriculture Production Technology with NVQ level-5 certificate for students , who are native from Nothern Province.

Eighteen students were recruited for the school and they are studying in the school with fewer facilities such as shortages of lecturing staff and other infrastructure facilities.

WOMEN AGRICULTURE EXTENSION PROGRAMME (WAE)

Mission of Women Agriculture Extension Program is to improve nutritional security and social status of farm families through increasing women's contribution for Agriculture development of the country in

Agricultural production as well as service sectors.

Promotion of local food, introduce entrepreneurship promotion programs for women, promote better home environments, establish and strengthen women's organizations are among the major services provided by the program. Women Agriculture extension program is implemented at grass root level by Subject Matter Officers (WAE) attached to the office of the deputy Director (Extension) in each district.

Extension activities performed in 2016

- Five 'Hela Bojun' sales centers were opened at Pinnawala, Ampara, Nuwara Eliya, Polonnaruwa and Mahiyanganaya. 150 new women entrepreneurs were recruited for above centers.
- With the aim of increasing local food consumption among school children three School canteens were converted to function as 'Hela Bojun' outlets at Kandy city. Canteens of Mahamaya girls college, Girls High school and Kingswood college are the three canteens converted like this.For these three salse centres 24 women entrepreneurs were recruited.
- Subject matter officers of WAE in island wide (35) were trained on women agriculture extension activitiesand nutritional food promotion programs.
- Thirty eight new women's agricultural extension organizations were established all over the country.
- Thirty six training classes were conducted for 820 women entrepreneurs all over the country. Out of this 154 women have been working in newly established 16 private 'Hela Bojun' outlets.
- With the aim of supporting entrpreneurs to begin their own business, 3 entrepreneur development programs were conducted for 60 women entrpreneurs presently enrolled to 'Hela Bojun' sales centers.This program was conducted under the topic of "Start Your Business" with the supporting facilities of Central Province Department of Industrial Development .
- Two television programs (Ranbimata Arunella) based on newly established 'Hela Bojun' sales centers in Nuwara Eliya and Ampara were telecasted.
- Nutrition analysis was done for 91 local foods which are preparing in 'Hela Bojun' sales centers with the assistance of University of Wayamba.
- Construction work of 06 'Hela Bojun' sales centers were carried out.

AGRO ENTERPRISE DEVELOPMENT & INFORMATION SERVICE

The Division of Agribusiness counseling (DOAgbiz) also known as Agro Enterprise Development and Information service under Extension & Training Centre of Department of Agriculture is the focal point for agri-business and agro entrepreneur development activities in Department of Agriculture.

DOAgbiz implements agro entrepreneur development activities through different approaches. Major programs handled by the Division of Agribusiness Counseling are as follows.

Initiatives on enhancing safety and quality of Agri food products by adapting Good Agriculture Practices (GAP)

- The project of "Establishment of a mechanism to ensure quality and safety of Agricultural commodities to local and export markets through GAP" is implemented through Division of Agribusiness Counseling (DoAgbiz).
- The main duties and responsibilities of the officers attached to the DoAgbiz are instructing, inspecting, and monitoring of the whole value chain from the field (soil and seed) up to the retail markets when it comes to local market aspect and up to exit point which is National Plant Quarantine Service (NPQS) gate when it comes to European export market in order to assure the quality of products. Their duties also include prepare weekly based cropping calendar to maintain a backup volume to ensure the consistent supply.
- Also 1,000 training programs were conducted island wide on GAP practices. 400 GAP based farms were formed. 22 government demo GAP farms were established island wide. 15 field tours were organized for GAP farmers. Additionally, 10 GAP farmer cooperatives were formed. 1,150 farmer information were gathered for the farmer database.
- Good Agricultural Practices (GAP) is being introduced on crop basis for fruits and vegetables. Producers are registered and certified at DOAgbiz as quality assured suppliers while DOAgbiz act as a data hub to provide necessary information to the parties concerned. Agribusiness Counselors in the field were provided with latest IT facilities (Android tablet PC, Laptop computers and etc.) for fast dissemination of information and issuing of QR certificate for traceability.
- With the successful implementation of GAP project, export of fruits and vegetables for european market was promoted. And also safety & quality of consignments assured. By that it was able to minimize rejections from export market from 389 (year 2013) to 12 (year 2016). Bitter gourd 100 mt, Snake gourd 70 mt, Mango 04 mt and Guava 01 mt were exported to European market in 2016.
- DoAgbiz has given technical assistance to develop Sri Lanka Good Agricultural Practices SL-GAP standard. This was developed in collaboration with SLSI, DoA and other relevant public and private organizations. Now standards has been published as "Sri Lanka Standard 1523 part 1:2016, UDC 631.57:634.

Capacity building programs for interested parties to become Agro Entrepreneurs

DOAgbiz organized and conducted Agro Entrepreneurship development courses in each year. There are 20 different modules which gives theoretical and practical aspects of becoming a successful Agro Entrepreneur. This module covers a wide range from on farm cultivations, value addition and identification of potential agribusiness and proposal writing. Under this program 560 trainees (953 man days) were trained. 75 number of project proposals based on commercially valued Agro enterprises for potential entrepreneurs issued on request.

Farm development and productivity enhancement technical consultancy services

DoAgbiz offered its services to develop underutilized commercial level farms. The proprietor can make formal request with the details of the current status of the property and express the interest. Afterwards the institute will select a group of experts according to the interest to visit the farm and technical recommendation to meet the intended production.

Monitoring & Technical Assistance to collaborative agricultural service station called "Krushi Sewa Piyasa" (KSP)

KSP has established by DoAgbiz in the previous years with the aim of providing special services or normal inputs and advisory services required for the market oriented farming were monitored. Department of Agriculture is technically collaborating with the KSP to the knowledge of the managers to assure better service from them. Minimizing the incidences of usage of inappropriate chemical and other inputs for agriculture is one of the major objectives of this project. DoAgbiz has provided technical assistance to KSPs.

Linking the services of the Department of Agriculture

Entrepreneurs who seek technical information and services of the DoA, such as seed certification, plant quarantine, laboratory testing, and extension services were supported by DoAgbiz through proper coordination staff.

BEE DEVELOPMENT UNIT – BINDUNUWEWA, BANDARAWELA

Bee keeping Development unit is responsible for the Development and Extension of bee keeping among farmers. In order to dissemination of modern apiculture technology, following facilities are provided by the unit.

- Training of farmers, officers, students etc.
- Manufacturing bee keeping equipment.
- Training and registration of bee keeping equipment suppliers and certification.
- Technical support for government and non governmental institutions to implement bee keeping projects.
- Research work.
- Collecting of annual bee keeping & honey production data in Sri Lanka

Table 3.1.16: Progress according to the annual action plan -2016

Activity	Category	Number of training programs	
		Target	Progress
Bee keeping training programs	Officers	10	08
	Farmers	10	56
	University	-	03
	Students	-	11
Training on production of bee keeping equipment	Entrepreneurs	04	05

Activity	Category	Number of training programs	
		Target	Progress
Production of bee keeping equipment	Bee Boxes	700	547
	Smokers	500	213
	Brood Frames	-	130
	Honey frames	-	127
	Queen guard	1000	3501
Maintenance of bee colonies	Honey production	500 kg	328.25 kg
	Colony maintenance	250	230

HEAD QUARTERS OF YOUNG FARMERS CLUB (YFC)

Young farmers clubs are the village level institutions of the young farmer's clubs movement. Other components belongs to the young farmers' clubs movement are district level primary consultative committee, provincial level consultative committee, and national level federation. Relevant activities are planned, and implemented by these committees at different levels with the participation of membership. The overall coordination is done by the headquarters of the Young farmers clubs movement. There are nearly three thousand Young Farmer's clubs formed and one third of them are registered at the headquarters.

During the year 2016, Island wide programs were conducted to create the participation of young farmer's club members for agricultural extension. A total of 450 training programs were conducted for YFC members and 45 training programs for officers. To introduce commercial Agriculture Projects for YFC members, 210 training programs were conducted. Other than these programs 450 cultural programs, 250 religious programs, 160 educational programs and 800 social programs were conducted. Further to these programs 125 islands wide publicity programs through electronic and printed media were conducted by the YFC. During this year 1500 new YFC were established.

WATER MANAGEMENT & PROTECTED AGRICULTURE UNIT

This unit is dealing with following subjects in respect of technology generation and dissemination to the technical staff of the Department of Agriculture, Other departments and institutes, Private sector and to the farming community in Sri Lanka.

- Agricultural adaptation technologies to mitigate climate change
- On farm Irrigation & Irrigation management
- Micro irrigation technology & fertigation technology
- Controlled environment agriculture (Protected Agriculture) (Poly–tunnel, Rainout shelters, Net houses)

- Commercial farming (Advanced planning of commercial farms) for annual and perennial crops
- Hydroponic culture & Advanced Nursery Management

In order to facilitate the above process relevant books booklets, handouts and presentations were prepared. Providing the required technical knowhow for the establishment of small to large scale commercial farms also a vital role in this unit. In addition to that provides technical support for the farm development programs using micro irrigation and protected Agriculture. Ministry funded projects were also successfully carried out by this unit while helping to carried out other programs conducted by Department of Agriculture such as Crop leader program.

Progress

Technology generation & dissemination

- Introduction of agricultural adaptation measures for climate change
- Introduction of low cost Bamboo tunnel
- Introduction of artificial lighting in green house for continuous production
- 16 Trainings on
    - Climatic Change & future agricultural adaptation for officers and farmers
    - Protected Agriculture Technology for the officers and farmers
    - On farm water management & Micro Irrigation for the farmers and officers

Ministry funded projects

- DUNAT Project - Year around Mango production Project – Tom EJC mango plantation with micro irrigation and fertigation technology at Maha Illupallama
- Supporting Chilli Crop leader program
- AFACI -GAP Project

PLANNING & PROGRESS MONITORING UNIT

The main responsibility of Planning and progress monitoring unit is preparing action plans for all financial and technical activities of ETC and monitoring the progress of those activities.

During the year 2016 annual action plans for capital allocations of all sub units of ETC were collected and compiled by Planning and Progress Monitoring unit. Other than above activities all action plans relevant to technical activities and special projects were also collected and compiled by the unit. Preparation of monthly progress reports of capital, recurrent and special projects allocations and technical activities of ETC were also carried out by this unit. Monthly progress reports of Capital recurrent, technical and special projects comes under DOA and Ministry votes were prepared and sent to Progress Monitoring & Evaluation Unit of DOA and progress reports of National food production program were sent to monitoring cell of DOA. The unit also involved in providing information for Annual Performance report of the Department of Agriculture, Central Bank report, parliamentary Budget Speech and disseminating information to relevant agencies. Proposals received to submit for annual budget also compiled by the unit.

AGRICULTURAL EDUCATION & EXAMINATION UNIT

The Education & Examination unit of the Extension and Training Center consists of

three sections namely Education, Examination & Curriculum Development.

a) Education

Five schools of Agriculture conducting National Vocational Qualification (NVQ) level 6 Higher National Diploma in Agriculture Production Technology (HNDAPT) and 6 Schools of Agriculture conducting National Diploma in Agriculture Production Technology (NDAPT) are functioning under the Education sub unit.

There are 633 students are following HNDAPT in the NVQ level 6 Schools of Agriculture located at Angunakolapelessa, Karapincha, Kundasale, Pelwehera, Vavuniya. In addition 216 student are following the NDAPT in the schools of NVQ Level 5 located at Anuradhapura, Bibila, Paranthan, Palamunai, Labuduwa & Wariyapola. Alltogether 849 students are following the course residentially by the end of year 2016.

During the year field exhibitions were conducted in all Agriculture schools to mark the centenary celebrations of Sri Lanka School of Agriculture.

In this year 2 Agriculture schools were added to the system to conduct NVQ level 5 course at Anuadhapura & Paranthan. School of Agriculture. Anuradhapura has already existed but the NVQ level 5 course was started in School of Agriculture Anuradhapura in this year.

b) Examination

The examination sub unit conducts various examinations for officers of the DOA while handling all semester end examinations of 11 schools of agriculture annually. Fifteen Departmental Examinations & efficiency bar examinations have been held by the examination sub unit and the number of candidates sat for these examinations were 800 by the end of 2016.

The limited and open examinations for recruitment for the posts of Technological Assistant (Engineering/ Mechanical), Technological Assistant (Extension & Research), KVS, Seed Technician and Artist/ Photographer were held and the number of candidates sat for aforesaid examinations were 60,1300, 320, 280 and 80 respectively during the period 2016.

In addition, the examination for admission to the NVQ level 5 schools of agriculture for the academic year 2016-17 was held and total number of candidates sat for the examination was 410. A total of 2705 applications were received for NVQ level 6 school admission and Examination unit has selected the eligible candidates from the applications to sit for the exam which was conducted by the Examination Department.

Exams regarding one year practical training program was conducted for Agriculture Research & Production Assistants (ARPA) who have been attached to the Department of Agrarian Development since 2005.

c) Curriculum development

The technical support for development and amendment of competency based training (CBT) curriculum was entirely provided to the UNIVOTEC (University

of Vocational Technology) by this unit. In addition lesson plan and scheme of training were developed according to the CBT curriculum for both NVQ level 6 & 5 courses.

Table 3.1.17: Number of Students as at December 2016 - NVQ level 06 schools

School of Agriculture	Year	Medium						Total
		Sinhala		Tamil		English		
		Girls	Boys	Girls	Boys	Girls	Boys	
Kundasale	1st	32	68	04	16			**120**
	2nd					59	59	**118**
Angunakolapelessa	1st	09	42					**51**
	2nd					39	25	**64**
Pelwehera	1st	36	42					**78**
	2nd					30	34	**64**
Vavuniya	1st			35	16			**51**
	2nd					16	21	**37**
Karapincha	1st	00	25					**25**
	2nd					00	25	**25**
Total		**77**	**177**	**39**	**32**	**144**	**164**	**633**

Table 3.1.18: Number of Students as at December 2016 - NVQ level 05 schools

School of Agriculture	Year	Medium						Total
		Sinhala		Tamil		English		
		Girls	Boys	Girls	Boys	Girls	Boys	
Anuradhapura	1st	37						**37**
Bibila	1st	46						**46**
Labuduwa	1st		39					**39**
Palamunai	1st			21	10			**31**
Paranthan	1st				25			**25**
Wariyapola	1st	38						**38**
Total		**121**	**39**	**21**	**35**	**0**	**0**	**216**

PLAN FOR 2017

Agricultural Extension & Training Programs

Following programs will be implemented by Extension and Training Centre in the year 2017. Agricultural extension programs in 6 Inter-Provincial areas

- The focus for 2017 will be to enhance the productivity of the major crop paddy grown in IP areas to ensure food security of the country. Paddy productivity improvement program will be implemented island wide under National Food Production Program.
- Increase the cultivation extents and productivity of Other Field Crops will be emphasized as a solution to cut down imports and save foreign exchange. Island wide special program will be implemented under national food production program to increase the extents, production & productivity of OFC.
- Production of fruits will be enhanced through rehabilitation programs and introduction of agro ecologically suitable fruit varieties. Vegetable production during off season will also be strengthened appropriately by each IP area to reduce the vegetable during the off season.
- Conduct Higher National Diploma in Agricultural Production Technology NVQ level 6 course at all 5 Schools of Agriculture. Around 300, NVQ 6 level diploma holders will be passed out and a new batch will be recruited for the course.
- Conduct National Diploma in Agricultural Production Technology NVQ level-5 agriculture course at Schools of Agriculture Wariyapola, Labuduwa, Palamuna, Bibile and Paranthan. Around 216 students will be passed out and new batch will be recruited for the course.
- Conduct NVQ level 3-4 level training courses at School of Agriculture - Labuduwa, School of Agriculture - Wariyapola, HTDI - Bibile, ISTI - Angunakolapelessa, ISTI - Hansayapalama and DATC - Weerawila.
- Conduct Agriculture Training Programs for officers and farmers at three In-Service Training Institutes, four District Agricultural Training Centres, Farm Mechanization Training Centre, and Bee Development Unit.
- Conduct following exams according to the exam calendar of year 2017.
    - Examinations of Higher National Diploma in Agricultural Production Technology & National Diploma in Agricultural Production Technology
    - Departmental examination for officers of the Department of Agriculture
    - Competitive examinations for recruitment of students to Schools of Agriculture NVQ level 5
    - Efficiency bar examinations for officers of the Department of Agriculture
    - Examinations for awarding scholarships for the government officers who will be selected to the Schools of Agriculture.
- Conduct training programs for Young Farmers Clubs members
- Conduct Women Agriculture Extension progams
    - Open five new 'Hela bojun' centres at Ratnapura, Moneragala, Kurunegala, Mannar and Kilinochchi.

- Training of DOA officers
- Training of new entrepreneurs for new 'Hela bojun' sales centers
- Preparation of training aids such as booklets and flip charts.
- Dissemination of technology through radio programs, television programs and exhibitions.
- Establish women production societies and provide processing machineries free of charge.
- Provide basic equipment and other necessities for 'Hela bojun' sales centers
- Maintain & further development of existing 'Hela bojun' centers including land development & Landscaping
- Construction of changing rooms & wash rooms at Warkarai, Padiyathalawa

- Conduct Agri buisines counselling programs
  - Expand the program on supplying safe and quality assured agri food to local and export markets specially certified under SL-GAP
  - Expected to give awareness to general public and farming community on the new standard on SL GAP
    - Facilitation of setting up SL-GAP standard volume 2 (Paddy) and volume 3(OFC)
    - Formation and Facilitation of fruits and vegetable farms and OFC farms under SL-GAP
    - Establishing GAP model farms at DOA /PDOA/Mahaweli farms
    - Island wide awareness and training programs on GAP
    - Awareness on GAP using printed publications
    - Establishing sales outlets selling GAP certified agri products to local market
    - Producing Media programs regarding GAP success stories
    - Establishing GAP farmer information database
    - Facilitation of Central hub and regional stations on GAP implementation
    - Facilitation of Certification Body (CB) activities
    - Agri-entrepreneurship development training program
    - Providing technical assistance for commercial farm development
    - Continuation of Agribusiness Program
- Conduct Micro irrigation & protected agriculture activities
  - Increase awareness of officers and farmers on Climate change adaptation measures, Protected Agriculture and Micro Irrigation by conducting trainings and workshops.
  - Take part in National Food production program by introducing year around fruit & vegetable production under protected house and open field cultivation with micro irrigation.
  - Conduct farmer participatory research regarding fertilizer use in protected culture and application of artificial lights in green houses for year around production.
  - Providing specifications for protected houses and micro Irrigation systems.

- Preparation of printed materials on related subjects.
- Mass media programs

- Conducting bee development activities at Bee keeping unit, Bindunuwewa and sub units
  - Establishment of 100 bee colony producers island wide.
  - Establishment of 10 new bee equipment producers.
  - Certification program for bee equipment before sale.
  - Further enhancement of 40 youth cooperative societies.

Special Projects

- Continuation of the project on Development of Sri Lanka School of Agriculture for producing competent professionals.
- National food production program - Paddy
- National food production program - Maize
- National food production program - Green gram
- National food production program - Soya bean
- National Chilli development project
- Change present day food patterns to improve nutrition security through 'Hela bojun' sales centers
- Promotion of healthy food
- Establishment of a mechanism to ensure quality and safety of Agricultural commodities to local & export markets through GAP
- Development of training centers conducting courses for NVQ 3 & 4 level training in the Department of Agriculture
- Development of Agriculture schools conducting NVQ level 5 Agriculture Diploma course in the Department of Agriculture
- Promotion of home gardening
- Bee development program
- Promotion of organic fertilizer production & utilization project
- Promotion of entrepreneurship of members of young farmers clubs based odn Agriculture production program
- Establishment of Agricultural Extension Technology Centers
- Renovation of existing two hostel buildings at Farm Mechanization Training Centre, Anuradhapura for use of the School of Agriculture.
- Enhancement of asesement capacity of the Examination unit of the Department of Agriculture for productive human resource development.
- Development of School of Agriculture, Paranthan for conducting NVQ level 5 Agriculture Diploma course in the Department of Agriculture.
- Strenthning Agriculture extension system of Sri Lanka by mobile technical advisory service.

STAFF LIST

Designation	No. Existing
Director	01
Additional Director	02
Deputy Director	23
Assistant Director of Agriculture	101
Lecturer (Contract)	10
Administrative Officer	03
Economist Assistant	01
Translator (English)	01

Designation	No. Existing
Agricultural Monitoring Officer	16
Program Assistant (Agriculture)	14
Development Officer	61
Librarian	01
Agriculture Instructor	321
Research Assistant	01
Public Management Assistant	91
Technological Assistant	246
Farm Clerk	06
Warden (Female)	13
Driver	77
Tractor Operator	03
Store Keeper	12
Plant Yard Attendant	06
Mechanic	05
Carpenter	03
Electrician	01
Technician	07
Fitter	01
Research Sub Assistant	02
Water Pump Operator	01
Bee Keeper	08
Budder	08
Steward	01
Cook	30
Waiter	02
Circuit Bungalow Keeper	06
Lorry Cleaner	01
Office Employee	11
Watcher	114
Laborer	527
Sanitary Laborer	04
Laborer (Contract)	93
Total	**1835**

3.2 INFORMATION AND COMMUNICATION CENTRE (ICC) - GANNORUWA

The Vision of the Information and Communication Centre (ICC) is to achieve excellence in the use of Information and Communication Technologies (ICTs) in agriculture for national prosperity and the mission is to adopt ICTs in agriculture to make food crop sector more efficient and effective, to improve public access to Agriculture information and DOA services and to create more citizen centric governance in agriculture through ICTs.

Objectives of the ICC are collection, compilation and dissemination of agriculture information through electronic and print media, Introduction of e-solutions with development of software solutions/ database for information management and also to conduct Agriculture exhibitions and operate Agriculture Technology Parks to promote Agro tourism.

Units under the ICC are the Headquarter Director's office, National Agriculture Information and Communication Centre, Farm Broadcasting Service, Agriculture Publication Unit, Agro Technology Park, Gannoruwa and Bata atha.

BUDGET

Allocations received and expenditure incurred under different votes are given in Table 3.2.1.

Table 3.2.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	27,277,545	23,389,021	86
Capital	71,461,500	65,541,293	92
Projects			
• Media program	30,000,000	29,904,748	100
• A-Park	4,500,000	4,493,295	100
• Exhibition BMICH 'Wasa wisa nethi ratak'	1,569,000	1,566,933	100
• AFACI- ATIN project	1,466,003	1,374,584	94
• Crop forecasting	2,400,000	2,372,546	99
• Organic fertilizer production & usage promotion program	10,000,000	9,169,620	92
Total	**148,674,048**	**137,812,040**	**93**

PROGRESS

ICC HEAD QURTERS

Main responsibility of this Centre is Coordinating and monitoring of the ICC units to perform the ICT activities of the DOA. In addition, coordinating other media stations for DOA media needs are also handled by the headquarters.

During the year 2016 ICC was able to finalize Sri Lankan e-agriculture strategy and publish as the pioneer country in the world. The Sri Lanka E-agriculture Strategy lays down a roadmap by which ICT developments can significantly contribute towards achievement of the country's agriculture vision and development objectives.

Agriculture Technology Information Network in Asia (ATIN) project was implemented by ICC. Twelve volumes of Agriculture Technology Information newsletters were produced and distributed on timely relevant agricultural issues. Three Crop Calendars on paddy were designed, published and distributed in both Sinhala and Tamil languages under the AFACI - ATIN project. The ATIN, Sri Lanka project has been selected again as the most outstanding ATIN project in AFACI member countries for 2016.

Workshop on "Information Sharing Policy for Agriculture data and information management" was organized with the assistance of Information and Communication Technology Agency (ICTA). Another workshop on "Implementation of E-agriculture Solutions for 2017" was organized with the assistance of Food and Agricultural Organization (FAO), International Telecommunication Union (ITU) and Centre for Agriculture and Biological Sciences International (CABI).

Under the other media coordinating activities, twenty six 'Ranbimata Arunalu' programs on ITN TV were produced and telecasted and twenty 'Malarum Boomi' Tamil programs were telecasted through Wasantham TV channel. Ten Shadda TV programs, ten Rangiri Sri Lanka programs and nine Siyatha TV programs were produced and telecasted.

NATIONAL AGRICULTURE INFORMATION & COMMUNICATION CENTRE (Former Audio Visual Centre)

National Agriculture Information and Communication Centre (NAICC) a new six story building located at Gannoruwa, Peradeniya was inaugurated by Hon. D.M Jayarathna, Former Prime Minister on 14th October 2016 with the presence of Hon. Duminda Dissanayake, Minister of Agriculture, Hon. Ediriweera Weerawardena, Acting Chief Minister of Central Province and other distinguished invitees. Main objective of this Centre is to achieve excellent use of ICTs for Agriculture development in Sri Lanka. The office of the Director (Information and Communication), Farm Broadcasting Service (Kandurata Unit) and several sections of the Audio Visual Centre (Graphic Section, ICT Section, Agriculture Advisory Service, Training Section) were moved to National Agriculture Information & Communication Centre, Gannoruwa. Remaining sections of AVC (Agro Park - Gannoruwa, Exhibition and Video section) are now operated separately

under Gannoruwa Agriculture Technology Park Unit.

Several information services will be strengthened through this Centre. 'Govi Sahana Sarana' Agriculture Advisory Service has been extended from 4 call agents to 20 call agents. Call agents are Agriculture Instructors having more than 05 years of field experience. New technologies will be initiated to support farmers to solve their problem through mobile phones. ICT initiatives have been implemented with upgraded IT technology. Krushi FM web radio has also been established at the new Centre and a separate radio channel for Agriculture will be established. New e-agriculture services identified by the 'Sri Lanka e-Agriculture strategy' will be implemented. The graphic unit with computer facilities is also established which designs all print media materials for farmers. Designing and production of IMMCDs is also improved by these facilities. Training facilities are upgraded with a separate computer lab and a separate auditorium with 250 seats. Services provided through this Centre are;

Design and production of Agriculture publications, leaflets, posters, large format prints for hoardings and banners.

Operating Agriculture Advisory Service "*Govi Sahana Sarana Sevaya*" (Telephone Short Code 1920).

Developing and Updating websites;

DOA website at new address (www.doa.gov.lk), *Wikigoviya* website (www.goviya.lk), Rice Knowledge Bank in Sri Lanka, *Krushi Lanka Dwaraya*, AFACI-ATIN Sri Lanka website and BFN website Sri Lanka (www.bfnsrilanka.org)

Developing and Management of Databases, Publication Unit Information System, Crop Forecasting Information System, 1920 Call Centre System, National Plant Quarantine Service, Human Resource Management and Seed Database

- Designing Networking - Network administration, internet access administration and intercom
- Interactive Multimedia CD production on various crops and subjects
- Hardware and software troubleshooting and solutions
- Maintaining DOA social media, Face book, Twitter, You tube and Google Plus
- Conduct training on audio visual teaching aids and presentation technology
- Production of two TV documentary programs weekly 'Govibimata Arunalu' on Sundays at 6.30 p.m. and 'Mihikatha Dinuwo' on Fridays at 6.15 p.m. on National TV.
- Management of Agro Technology Parks at Gannoruwa.
- Organizing agricultural exhibitions at regional and national level.

Progress

Training

Training programs - 8/ 144 man days

Graphic Communications

Technical publications - 23

Leaflets/ Brochures - 29

Hoardings/ Display boards - 15

Exhibition/ Research posters - 248

Paper supplements/ Posters for offset printing - 20

Desktop presentations - 17

Invitation Cards/ Greeting Cards - 347

Labels/ Stickers/ Name Boards – 3,253

Institute name boards - 54

Banners – 14

Video/Photography

'Mihikatha Dinuwo' TV documentary - 48

'Govibimata Arunalu' TV documentary - 47

Other documentaries - 50

TV short messages - 50

Video program duplication - 208

Digital photography - 32,477

Sound studio recording for videos – 43

Information Technology

IMM CDROMs - 01

Updated web pages - 1028

Creating new web pages - 745

Database and software development - 887 hrs

Database trainings - 145 man days

Network administration - 164 hrs

Establishing network - 94 hrs

Hardware software maintenance - 597 Jobs

Network trouble shooting - 206 jobs

Conduct Trainings

Trainings - 16 programs (374 man days)

'1920 Govi Sahana Sarana' Advisory Service

No. of queries handled - 24,278

Through Skype (Video calls) - 19

No of SMS handled – 3,823

Social media updating

Twitter - 320 pages

Facebook -776 pages

Google plus - 404 pages

Video Uploading

Video -108 programs

YouTube – 39 programs

A Park - Gannoruwa

Number of visitors (School Children) - 36,910

Number of visitors (Adults) - 34,849

No of foreign visitors - 352

Income (entrance ticket) - Rs.1,196,430.00

Sales Centre income (rent) - Rs. 1,076,935.00

Exhibitions

Designed/ conducted exhibitions - 06

Poster service for exhibitions - 609

Landscape design for DOA - 01

Landscape design for others - 05

AGRICULTURE PUBLICATION UNIT

The broad objective of this unit is to disseminate appropriate agricultural technology information and other related information through print media. To achieve this broad objective, Agriculture publication unit is responsible for the publishing and distribution of printed materials of the Department of Agriculture to support field extension activities. Agriculture Press and Publication, Sales and Distribution unit at Peradeniya are under the purview of this unit. Agriculture press of this unit caters the entire printing requirement of the DOA and it includes technical and non-technical publications. In addition to this, it undertakes the printing requirements of the Ministry of Agriculture. The Distribution Centre is responsible for distribution of printed materials for sales and free issues.

Progress

During the year under review, a total of ten (10) new publications were published by this unit. Twenty one publications were reprinted. Thirty one thousand (31,185) copies of crop calendars were produced for Paddy crops in

Sinhala and Tamil under the AFACI-ATIN project.

Nearly 2.7 million rupees were earned by selling of publications and IMMCDs through two Sales Centers of this unit. In 2016 a total of Rs 2.1 million was earned through Sales Centre, Galaha Junction and Rs 0.55 million was earned through Sales Centre, Gannoruwa. In addition to this a total of Rs 0.388 was earned from selling of waste papers, other used materials and issuing of tender documents etc.

Table 3.2.2: Publications reprinted in 2016

Name of the Publication	No. of Copies
Brinjal cultivation	2,500
Collection of Insect pests	2,000
Water melon cultivation (S)	5,000
Budding and layering (S)	2,500
Banana Diseases (S)	2,500
Home Garden (S)	15,000
Organic Manure Production (S)	9,000
Certified seed paddy production (S)	2,500
Bee keeping (S)	12,500
Crop production in protected house (S)	2,500
Tissue Culture (S)	7,500
Tissue Culture (T)	1,000
Kohomba as a pesticide (S)	2,000
Rice based products (S)	2,500
Orange and Mandarin (S)	1,000
Vegetable Cultivation (S)	5,000
Mushroom (S)	5,000
Storage of Seed paddy (T)	1,500
Cultivation of Avocado (S)	2,500
Papaw (S)	5,000
Papaw (T)	2,500
Total	**91,500**

S – Sinhala **T -** Tamil

Table 3.2.3: New books published in 2016

Name of the Book	No. of Copies
'Govikam Sangarawa' 46-4	4,000
'Govikam Sangarawa' 47-1	3,700
'Govikam Sangarawa' 47-2	3,700
'Govikam Sangarawa' 47-3	3,700
'Kamatolil Vilakkam' 53-1	425
'Kamatolil Vilakkam' 53-2,3	415
'Kamatolil Vilakkam' 53-4	510
Kamatolil Vilakkam 54-1	625
New Crop Varieties 2015	500
Cultivation calendars for Paddy cultivation	31,185

In addition to the above DOA publications, Agriculture Press printed different types of materials including leaflets, posters and invitation cards etc. Entire seed certification labels and forms of the Seed Certification Service are printed at the DOA press.

Table 3.2.4: Materials printed in 2016

Type of Publication	No. of copies
Books and booklets for other units (70 types)	100,576
Leaflets (47 types)	1,859,600
Posters	114,850
Invitation cards and visiting cards (24 types)	13,581
Home Garden seed packets	523,800
File covers (14 types)	10,275
Seed labels	335,000
Letter heads	110,000
Crop forecasting books	31,060

Type of Publication	No. of copies
Crop forecasting forms	216,342
Forms	200,508
Certificates	3,130
Agtec	7,795

Free issues of publications

Publications issued among technical staff of DOA and Provincial DOA during this year.

1. 'Govikam Sangarawa'

Volume 46-4 - 3355

Volume 47-1 - 3458

2. 'Kamatolil Vilakkam'

Volume 53-1 - 415

Volume 53-2, 3 - 415

Volume 53-4 - 510

3. Recommended Crop Varieties - 500

4. DOA Newsletter, 12 issues - 48,000

FARM BROADCASTING SERVICE (FBS)

Farm Broadcasting Service of the Department of Agriculture undertakes production and broadcasting of agricultural radio programs to disseminate timely relevant agricultural information to farming community in order to improve their knowledge and change attitudes. Vision of the unit is to achieve excellence in radio medium in agriculture for national prosperity and mission is to identify, produce and broadcast agriculture radio programs to make food crop sector more efficient and effective to improve public access to Agriculture.

Objectives of the unit are:

1. Create awareness about more productive new agricultural practices among farmers.
2. Make aware of problems encountered in farming and possible effective solutions for those problems.
3. Create interest in agriculture as potentially profitable income generator.
4. Generate positive attitude with respect to agriculture among public.
5. Make farming community aware of environmental and other hazardous consequences related to different agricultural practices.
6. Provide platform for farmers to express their views and ideas with respect to agriculture related policies and strategies introduced by the relevant authorities.
7. To promote home gardening activities in all houses in the country to ensure food security, nutrition and chemicals free food items.
8. To make the agriculture a very attractive carrier to the young men and women in the country.

The main Farm Broadcasting unit is situated at Narahenpita, Colombo and three sub units are at Anuradhapura, Kandy and Matara.

These units broadcast radio programs in both Sinhala and Tamil medium via different radio channels. Many Radio programs are broadcasted in "Sandya Sevaya" special time belt on "Sinhala National Service".

Krushi FM web radio (www.krushifm.lk) has been implemented as the pioneer to establish a live Radio Channel for Agriculture in future.

Programs produced by this unit are given below.

Table 3.2.5: Radio Programs Broadcasted in year 2016 (Under the Normal Media budget)

Day	Time	Radio Program	Format	Production Unit	Frequency
Monday	9.00-10.00 a.m.	'Govithenata Peyak'	Live discussion	Colombo	FM 91.7/91.9
	6.35-6.50 p.m.	'Govi Gedara'	Magazine program	Colombo	FM 91.7/91.9*
	6.45-7.00 p.m.	'Ranketha Addara'	Magazine program	Anuradhapura	FM 91.7/91.9*
	7.10-7.15 p.m.	'Sannasa'	Current agricultural information (News)	Matara	FM 91.7/91.9*
	7.15-7.30 p.m.	'Govisara'	Magazine program	Colombo	FM 91.7/91.9*
Tuesday	6.35-6.45 p.m.	'Seilama'	Recorded program	Colombo	FM 91.7/91.9*
	6.45-7.00 p.m.	'Kada Malla'	Magazine program	Matara	FM 91.7/91.9*
	7.00-7.30 p.m.	'Koratuwa'	Magazine program	Colombo	FM 91.7/91.9*
Wednesday	9.00-9.30 a.m.	'Rajaratay Govibimay'	Live program	Anuradhapura	FM 107.3/90.1
	6.45-7.00 p.m.	'Sara Boomi'	Magazine program	Colombo	FM 91.7/91.9
	7.00-7.15 p.m.	'Saruketha'	Magazine program	Anuradhapura	FM 91.7/91.9*
	7.10-7.20 p.m.	'Liyasaraniya'	Magazine program	Colombo	FM 91.7/91.9*
	7.20-7.30 p.m.	'Thirasara'	Environmental friendly cultivation practices (Role play)	Matara	FM 91.7/91.9*
	7.00-7.30 p.m.	'Kurinchi Malar'	Magazine program	Kandy	FM 107.3/107.5
Thursday	8.30-9.00 a.m.	'Wayamba Gewatta'	Live program	Kandy	FM 90.1
	9.00-9.30 a.m. Last Thursday 9.00-10.00 a.m.	'Ruhunu Gewatta'	Live program	Matara	FM 107.3/107.5
	6.30-7.00 p.m.	'Govijana Madala'	Live discussion	Colombo	FM 91.7/91.9*

Day	Time	Radio Program	Format	Production Unit	Frequency
Friday	7.00-8.00 a.m.	'Veettu Thottam'	Live discussion	Colombo	FM 102.1/102.3
	8.00-9.00 a.m.	'Aswenna'	Live discussion	Kandy	FM 107.3/107.5
	7.00-7.15 p.m.	'Krushi Charika'	Magazine program	Kandy	FM 91.7/91.9*
	7.15-7.30 p.m.	'Gangabadapaththu-we karaliya'	Drama	Matara	FM 91.7/91.9*
	7.00-7.15 p.m.	'Muhaduhal'	Feature	Kandy	FM 107.3/107.5
Saturday	6.45-7.00 a.m.	'Krushi Charika'	Magazine program	Kandy	FM 107.3/107.5
	8.00-8.15 a.m.	'Govibima'	Magazine program	Kandy	FM 107.3/107.5
	7.30-8.00 p.m.	Thunaththa	Discussion	Anuradhapura	FM104.4/105.7
	9.15-9.30 p.m.	'Ulavar Illum'	Magazine program	Colombo	FM 104.7/104.9
Sunday	6.30-7.00 p.m.	'Wanna Marudam'	Magazine program	Colombo	FM 102.1/102.3
	9.45-10.00 a.m.	'Boradiya Mankada'	Magazine program	Kandy	FM 107.3/107.5

* Broadcasted in 'Sandya Sevaya'

Table 3.2.6: Special radio programs broadcasted in year 2016 (Under National Food Production program budget)

Production Program	Name of the Radio program	No. of live programs	Frequencies
Home Garden Promotion Program	'Givithenata Peyak'	21	91.7-91.9
	'Ruhunu Gewaththa'	06	107.3-107.5
	'Rajaratay Givibimai'	03	107.3-107.5
	'Veettu Thottam'	10	102.1-102.3
Big Onion Promotion Program	'Ruhunu Gewaththa'	01	107.3-107.5
	'Rajaratay Givibimai'	02	107.3-107.5
	'Saara Prabha Gira'	02	94.3-94.5
Chili Promotion Program	'Ruhunu Gewaththa'	05	107.3-107.5
	'Rajaratay Givibimai'	01	107.3-107.5
	'Saara Prabha Gira'	02	94.3-94.5

Production Program	Name of the Radio program	No. of live programs	Frequencies
Healthy Food Promotion Program	'Ruhunu Gewaththa'	08	107.3-107.5
	'Saara Prabha Gira'	02	94.3-94.5

Table 3.2.7: Short messages broadcasted in year 2016 (Under the Normal Media budget)

Day	Time	Radio Program	Medium	Production Unit	Frequency
Monday to Friday	In between 5.50 a.m. and 6.20 p.m.	'Govi Dethata Ape Saviya'	Sinhala	Matara	FM 107.3/107.5
Monday to Sunday	In between 7.00 a.m. and 7.30 a.m. , In between 4.00 p.m. and 4.30 p.m.	'Kalavita'	Sinhala	Kandy	FM 107.3/107.5
Monday to Sunday	In between 6.15 a.m. and 7.15 a.m.	'Athvela'	Sinhala	Kandy	FM 104.4/105.7
Monday to Sunday	In between 6.00 a.m. and 6.30 a.m. , In between 6.00 p.m. and 6.30 p.m.	'Aththama'	Sinhala	Kandy	FM 90.1
Monday to Sunday	In between 6.15 p.m. and 7.30 p.m.	Short message	Tamil	Kandy	FM 107.3/107.5
Tuesday, Wednesday and Thursday	5.55 p.m. to 6.00 p.m.	'Asvedduma'	Sinhala	Matara	FM 107.3/107.5

Table 3.2.8 Special short messages broadcasted in year 2016 (Under the Special budget)

Broadcasting day	Budgeting Program	Program type	Broadcasting Time	Production Unit	Broadcasting channel & Frequency
Every Day June-September	Promoting of Organic manure usage and Production	Short messages on organic Manure production	Tamil Just before morning and evening news	Colombo	Thendral FM (104.7-104.9)
			Sinhala 6.52 a.m. and 6.22 p.m.		Lak Handa (93.5-93.7)
			Sinhala close to main news		Lak FM(106-106.2)

Broadcasting day	Budgeting Program	Program type	Broadcasting Time	Production Unit	Broadcasting channel & Frequency
Everyday November-December	National Food Production Program 2016-2018	Home Garden Promotion Program Big Onion Production Program Chili Production Program Healthy Food Promotion Program	6.00 a.m./ 12.44 p.m. /5.59 p.m.	Colombo	Thendral FM (104.7-104.9) and Sinhala National Service (91.7-91.9)

"Listeners Club" program is continuing and listeners are awarded with training programs workshops and field visits to popularize the radio programs and to get their feed back.

Other activities of Farm Broadcasting Service

- Operating of krushifm.lk web radio
- Enrolling Productivity activities
- Conducting stalls at exhibitions
- '200g Fruit Exhibition' at FRDI, Horana, 'Food Festival 2016' at Vihara Maha Devi Park, 'Dakshina Krushi Navodaya' at Labuduwa School of Agriculture
- Public addressing system service at various national events
- Compeering service for the Ministry and Departmental events
- Coordinating of 'Subarathi' Radio program, which was sponsored by Ministry of Agriculture
- Answer listener's Agricultural problems via telephone (650)
- Link SMS requests to radio programs

Table 3.2.9: Radio programs broadcasted in 2016

Unit	Radio Program	Target	Progress
Colombo	'Govithenata Peyak'	52	50
	'Govi Gedara'	52	48
	'Govisara'	52	48
	'Sara Boomi'	52	48
	'Koratuwa'	52	48
	'Seilama'	52	48
	'Govijana Madala'	53	48
	'Liyasaraniya'	52	47
	'Veettu Thottam'	52	46

Unit	Radio Program	Target	Progress
Colombo	'Ulavar Illum'	52	50
	'Wanna Marudam'	52	46
	Short Messages (Fruit Fly)	464	464
	Short Messages (Organic Fertilizer)	440	440
Kandy	'Aswenna'	48	48
	'Kalavita'	730	730
	'Krushi Charika'	50	50
	News updates	120	120
	'Kurinchi Malar'	52	52
	'Muhaduhal'	52	52
	'Boradiya Mankada'	12	12
	'Wayamba Gewatta' (1hr)	10	10
	'Wayamba Gewatta' (½hr)	37	37
	News updates (Wayamba)	120	120
Anuradhapura	'Rajaratay Govibimay'	52	48
	'Saruketha'	52	50
	'Ranketha Addara'	52	50
	'Thuneththa'	52	50
Matara	'Ruhunu Gewatta'	49	49
	'Asvedduma'	156	156
	'Thirasara'	51	51
	'Kadamalla'	49	49
	'Sannasa'	50	50
	'Govi Dathata Ape Saviya'	502	502
	'Gangabadapaththuwe Karaliya'	52	51

Table 3.2.10: Listeners club training programs and workshops in 2016

Unit	No of trainings & workshops	
	Target	Progress
Colombo	06	06
Kandy	04	04

AGRO TECHNOLOGY PARK

BATA - ATHA

As a quick information dissemination strategy and to promote agro tourism this Agro Park was established at Hambantota (Southern region) in the year 2007. This park is landscaped with edible plants (vegetables, root

crops and fruits) which provide an aesthetically pleasing environment. A wide range of Information and Communication strategies (live field demonstrations, self-explaining field instructional boards, facilitators for each demonstration sites, instructional leaflets, IMM CDs etc.) are introduced here for disseminating agricultural information to all those who visit this site daily in thousands.

Agro Technology Park, Bata atha under the Department of Agriculture is the best location to initiate appropriate programs to promote agro tourism in Sri Lanka. Such programs will definitely benefit rural farming communities through creating income generating avenues and also benefits the country by improving tourism industry. Strengthening of Agriculture Technology Parks through agro tourism initiatives will strengthen the present technology transfer mechanism in Sri Lanka. When local and foreign tourists visit A-parks and adjoining villages, it directly or indirectly benefits many sectors involved in tourism industry.

Bata atha agriculture Technology park has different demonstration sites such as Rice garden, Leafy vegetable garden, Fruit orchards, underutilized fruit garden, Medicinal garden, Chena, Spice garden, Banana garden etc. in an aesthetically pleasing edible landscaping environment. Arched two hands, is the gateway to the park; a symbol of the shared labour.

One other important aspect of this garden is the facilitation provided for agricultural education. There are 09 facilitators within the ground to guide visitors. Unlike other normal gardens and parks in the world, service of facilitators (Agriculture Diploma holders) are provided to make aware farmers, school children, and other general public at each section of the park.

Progress

Table 3.2.11: Financial Progress during 2016

Description	Income (Rs)
School Students	69,765.00
Other Students	68,800.00
Adults	463,120.00
Tourists' Children	1500.00
Adult Tourists	44,200.00

PLAN FOR 2017

- Establishing National Agriculture Information Network with all stakeholders
- Strengthening trainings on use of ICTs in agriculture and presentation media
- Strengthening '1920' Agriculture Advisory Services with more Call Centre agents (20 AIs)
- Establishing Mobile Technology initiatives for Agriculture with all mobile service providers and combine with '1920' advisory service
- Designing and developing database/ information system for Financing system, Knowledge Management system (1920), Krushi Cloud, Digital library and E-market
- Establishing mobile Apps for GAP, Vegetable Doctor, Fertilizer and Rice Doctor
- Establishing Management Information System for Soil test report generation, Office of the Registrar of Pesticides, e-Pytho, Research MIS, Work processing

system for graphic section and Progress report generating system

- Developing games and virtual tours (Agri games, virtual tours)
- Developing data classification and information sharing policy for DOA
- Establishing a full time Agriculture radio channel (Krushi FM) to strengthen the media activities of the DOA
- Publishing Agriculture newspaper (monthly/ weekly) to strengthen the agriculture awareness programs in the country
- Increasing the production of agriculture video programs telecast through different channels to ensure the dissemination of quick and relevant agriculture information to farmers
- Improving the Central Agriculture Library of the Department of Agriculture as a digital library to make access to agriculture information services for stakeholders in Agriculture.
- Promoting agro-tourism through Agriculture Technology Parks, Bata atha and Gannoruwa.
- Focusing all media activities mainly on the National Food Production Program (NFPP) and adopt multiple media approach.

STAFF LIST

Designation	No. Existing
Director	01
Additional Director	01
Deputy Director of Agriculture	02
Assistant Director of Agriculture	13
Administrative Officer	01
Information Technology Officer	14
Agriculture Monitoring Officer	01
Program Assistant (Agriculture)	02
Media Assistant	03
Audio Visual Assistant	03
Development Officer	22
Agriculture Instructor	51
Public Management Assistant	16
Technological Assistant	26
Farm Clerk	03
Audio Visual Technician	01
Driver	17
Cinema Machine Operator	01
Tractor Operator	02
Storeman	04
Lorry Cleaner	01
Carpenter	01
Photographer	01
Press Book Binder	02
Machine Minders	02
Composer	03
Video Editor	04
Video Editing Assistant	02
Video Lighting Assistant	04
Video Assistant	02
Sound Recording Technician	04
Exhibition Assistant	02
Electrician	01
Acting Foremen	01
Video/ Camera photographer Assistant	04
Mechanic	03
Painter	01
Office Employee	03
Watcher	28
Laborer (Permanent)	161
Laborer (Contract)	45
Total	**459**

4.1 ADMINISTRATION DIVISION - PERADENIYA

The role of the Administration Division can be briefly defined as the performance of various matters related to establishment matters of Public officers from obtaining approval to fill vacancies, calling of applications in terms of specified criteria, conduction of relevant written tests/ interviews, selection of most suitable applicants for appointments, recruitment dealing with all areas pertaining to promotions, efficiency bar exams, disciplinary matters and communications related to policy decisions of the state and the Department. The Division also communicates with organizations such as Public Service Commission, Human Rights Commission, Attorney General's Department, Parliamentary Advisory Committee and the office of the Commissioner of Parliamentary Affairs regarding various appeals and also with the other ministries and departments on administrative matters. Coordination of this overall process in accordance with the guidance and instructions of the Ministry of Agriculture is vested with the Administration Division.

During the year 2016 upon the decision of the Board of Directors, a Monitoring Cell has been established in the Department premises to monitor the activities of the National food production program.

BUDGET

Allocations given and expenditure incurred under capital and recurrent are given in Table 4.1.1.

Table 4.1.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	22,946,601	22,361,044	97
Capital	28,810,446	13,245,067	46
Total	**51,757,047**	**35,606,111**	**69**

PROGRESS

Appointments

The staff recruitment continued in year 2016. It led to overcome the staff deficiency of the Department up to some extent. Details of recruitments made are given in Table 4.1.2.

Table 4.1.2: Appointments made during 2016

Designation	No. of Appointments
Agriculture Instructor and Research Assistant	246
Technological Assistant (Engineering/ Mechanical)	10
Technological Assistant (Extension/ Research)	19
Budder	09
Circuit Bungalow Keeper	05

Designation	No. of Appointments
Bee Keeper	02
Watcher	09
Cook	02
Waiter	01
Seedman	01
Total	**304**
Contract Labor	466
Grand Total	**770**

Table 4.1.3: Number of new Post Approved by Department of Management Services in 2016

Designation	No.
Agriculture Instructor	100
Research Assistant	73
Total	**173**

Promotions

Table 4.1.4: Promotions made during 2016

Designation	No.
Agriculture Instructor	27
Research Sub Assistant	07
Store man	03
Bee Keeper	01
Watcher	09
Waiter	01
Laborer (Grade II to I)	29
Office Employee (Grade II to I)	10
Office Employee (Grade I to Special)	03
Promotions made by Director General of Combined Service's	
Public Management Assistant (Grade I to Special Grade)	03
Public Management Assistant (Grade II to I)	11

Retirement from the service

Table 4.1.5: Retirements during 2016

Designation	No.
Additional Director of Agriculture	01
Assistant Director of Agriculture (Development)	10
Assistant Director of Agriculture (Research)	05
Assistant Director of Agriculture	01
District Director of Agriculture	02
Director of Agriculture	02
Agriculture Instructor (Special)	03
Agriculture Instructor	20
Research Assistant (Special)	01
Research Assistant	04
Administrative Officer (PMA I)	02
Electrician	01
Driver	13
Cinema Operator	01
Storeman	02
Office Employee	05
Watcher	13
Cook	03
Bee Keeper	03
Tractor Operator	03
Lorry Cleaner	01
Laborer	82
Budder	02
Sanitary Laborer	01

Deceased while in service

Table 4.1.6: Deceased while in service during 2016

Designation	No.
Assistant Director of Agriculture (Development)	01
Agriculture Instructor	01
Tractor Operator	01
Driver	01
Budder	01
Laborer	04
Watcher	05

Release of officers to other posts

Table 4.1.7: Release of officers to other posts during 2016

Designation	No.
Agriculture Instructor	02
Technological Assistant	07
Tractor Operator	01
Mechanic	01

Vacation of Posts

Table 4.1.8: Vacation of posts during 2016

Designation	No.
Agriculture Instructor	01
Cook	03
Tractor Operator	01
Circuit Bungalow Keeper	01
Electrician	02

Resignation from Posts

Table 4.1.9: Resignation from Posts

Designation	No.
Technological Assistant (Extension)	28
Machinist	01
Budder	01

Officers released to provincial Council

None

Disciplinary Inquiries

Table 4.1.10: Disciplinary Inquiries during 2016

Category	Number of inquiries pending at the beginning of the year	Number of inquiries initiated during the year	Number of inquiries completed during the year	Number of inquiries pending as at 2016.12.31
Formal Disciplinary Inquiries/ Preliminary investigations	45	98	48	95
Government/ Internal Audit	12	04	16	0
Total	**57**	**102**	**64**	**95**

Table 4.1.11: F.R.104 Inquiries

Number of inquiries pending at the beginning of the year 2016	Number of inquiries initiated during the year 2016	Number of inquiries completed during the year 2016	Number of inquiries pending as at 2016.12.31
581	152	321	274

Amount of loans granted and Types of Salary Advances

Table 4.1.12: Details of loans and salary advances

Type of loan	No. of vouchers Approved	Amount paid (Rs.)
Distress	1550	192,698,022
Bicycle	02	24,000
Property	44	81,040,044

Agrahara Insurance Scheme

- Number of applications submitted for reimbursement of hospital charges and spectacles - 1193
- Number of natural death claims submitted - 24

Security Deposits

- Number of persons whose security deposits were released after retirement - 131
- Number of public officers those who bail bond money - 106

Pensions

Detail of the files received by the Pension branch are as follows.

- For payment of pensions 24
- For death gratuity 32
- For reversion of pensions 64
- For the refund of W&OP contributions 22
- Obtaining of W&OP
- contribution 04
- (Pension Circular 3/2014)
- For the payment of Service
- Gratuity to Contract Laborers 61
- For released of minority
- receipts 11

No. of officers granted to be out of the island for Post Graduate Degree

Ph.D.

Assistant Director of Agriculture (Agricultural Research) 02

Assistant Director of Agriculture (Agricultural Development) 01

M.Sc.

Assistant Director of Agriculture (Agricultural Economics) 01

Assistant Director of Agriculture (Agricultural Research) 01

Assistant Director of Agriculture (Agricultural Development) 03

No. of Officers returned after completing post-graduate Degree

M.Sc.

Assistant Director of Agriculture (Agricultural Research) 01

Assistant Director of Agriculture (Agricultural Development) 02

Release of officers to study within the island

Ph.D.

Deputy Director of Agriculture (Research) 01

Assistant Director of Agriculture (Agricultural Research) 05

Assistant Director of Agriculture (Agricultural Development) 01

M.Phil.

Assistant Director of Agriculture (Agricultural Research)	03

M.Sc.

Assistant Director of Agriculture (Agricultural Development)	01
Information and Technology Officer	06

B.Sc.

Agriculture Instructor	08
Research Assistant	06

Completion of Degree within the island

B.Sc.

Agriculture Instructor	07

Overseas visits abroad for training, workshops and other conferences

Table 4.1.13: Overseas visits during 2016

Designation	No.
Director General of Agriculture	04
Additional Director General	06
Additional Director	22
Chief Engineer	01
Chief Accountant	03
Provincial Director of Agriculture	06
Registrar of Pesticides	02
Chief Internal Auditor	02
Director	27
Deputy Director	13
Deputy Director of Agriculture (Research)	07
Deputy Director of Agriculture (Development)	11
Deputy Director of Agriculture (Seed)	02
Deputy Provincial Director of Agriculture	02
Asst. Director of Agriculture (Research)	59
Asst. Director of Agriculture (Development)	55
Asst. Director of Agriculture (Agricultural Economics)	04
Engineer	06
Accountant	02
Agricultural Instructor	137
Development Officer	04
Agricultural Monitoring Officer	03
Audio Recorder	02
Information and Technology Officer	02
Economic Assistant	03
Technological Assistant	05
Program Assistant (Agriculture)	13
Demonstration Assistant	01
Audio Visual Assistant	01
Research Assistant	01
Public Management Assistant	01
Research Assistant	15
Media Assistant	01
Technical Officer	01
Laborer	09
Farmer	05
Total	**439**

Local Training

Table 4.1.14: Local trainings conducted during 2016

Training	No. of Officers Attended
Program of productivity development	485
Awareness Program on Procurement	41

Training	No. of Officers Attended
Training of minor staff	130
Training on Disciplinary Inquiries	56
Training on F.R.104(04) Inquiries	52
Training on Storing	126
Training on filing of Personal files	278
Filing on office system	216
Training of Drivers	100
Total	**1484**

Recoveries

- Total amount recovered by the government during the year 2016 from the officers who have vacated the post and have breached the agreements is Rs: 5,936,225.91.

PLAN FOR 2017

- Functions related to appointments.
- Physical resources management.
- Disciplinary actions.
- Functions related to Security Deposits, Loans and Agrahara Insurance.
- Management development and training.
- Functions related to pensions of staff.
- Maintenance of Personal files.
- Functions related to local and foreign scholarships.

STAFF LIST

Designation	No. Approved	No. Existing
Director General of Agriculture	01	01
Additional Director General (Administration)	01	01
Director (Administration)	01	01
Director (Establishment)	01	-
Deputy Director/ Assistant Director (Establishment)	02	02
Deputy/ Assistant Director (Administration)	01	01
Legal Officer	01	-
Administrative Officer	08	07
Translator (English/ Tamil)	02	02
Legal Assistant	02	01
Development Officer	27	29
Public Management Assistant	98	93
Driver	08	09
Storeman	01	01
Office Employee	23	26
Watcher	06	08
Laborer	16	22
Sanitary Laborer	02	02
Total	**201**	**206**

4.2 ENGINEERING DIVISION – PERADENIYA

The main objective of the Engineering Division is to provide and maintain infrastructure facilities promptly to achieve the objectives of Department of Agriculture. In order to fulfill the requirements of the Department of Agriculture, the Engineering Division is facilitating with Farm Machinery Research Centre (FMRC) and four regional Engineering workshops.

The main functions of the Engineering Division are as follows:

A. Procurement of Capital Assets
   a. Civil engineering constructions
   b. Procurement of Machinery, vehicles and Office Equipment

B. Maintenance of infrastructure facilities
   a. Buildings and structures
   b. Vehicles and Machinery
   c. Office Equipment

C. Farm Machinery research and development activities

D. Other Services:
   a. Operation and Maintenance of drinking water supply scheme at Kundasale
   b. Provide engineering advisory services to all Divisions of DOA

Repair and maintenance activities of vehicles and farm machinery are decentralized by establishing regional workshops in Kundasale, Angunakolapelessa, Polonnaruwa and Sita Eliya. Technical Assistants and Engineering Assistants were stationed all over the country in speedy implementation of Civil Engineering activities in the country.

BUDGET

The budgetary allocations and expenditure under different votes for the year 2016 are given in Table 4.2.1.

Table 4.2.1: Annual Budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	12,090,208	11,374,435	94
Capital	9,245,200	8,953,844	97
Total	**21,335,408**	**20,328,279**	**95**

PROGRESS

Progress of Civil Engineering Activities

The activities carried out are as follows:

- New construction and repairs – This includes preparation of estimates, procurement activities and awarding contracts, work supervision and approval of payments
- Preparation of Estimates to carry out the jobs by other Divisions– As per the requests made by the respective divisions only the estimates were prepared by the Engineering Division and the procurement

activities were done by the respective division.

The summary of the Civil Engineering works carried out by the Division in 2016.

Requests Received

- New Constructions: 212
- Repairs: 123

Total work carried out:

- Minor Repair in Maintenance: 575
- Estimates Prepared : 579

Table 4.2.2: The value of the civil engineering works (Division wise summary) carried out during the year

Division/ Description	No. of Activities	Awarded Value (Rs.)
Field Crop Research & Development Institute	08	6,974,940
Horticultural Crop Research & Development Institute	56	64,374,473
Fruit Research & Development Institute	03	13,122,675
Rice Research & Development Institute	25	34,468,526
Natural Resources Management Centre	14	9,698,218
Seed Certification & Plant Protection Centre	56	40,811,137
Seed & Planting Material Development Centre	84	346,895,760
Socio Economic & Planning Centre	04	1,286,806
Extension & Training Centre	45	120,237,222
Information & Communication Centre	03	1,289,290
Administration	23	28,237,222
Engineering Division	10	1,785,992
Farm Mechanization Research Centre	01	7,014,623
Finance Division	04	1,791,969
Total Amount (Rs.)	**336**	**677,988,852**

No. of works was very high compared to last few years.

Progress of Mechanical & Electrical Engineering Activities

The activities carried out in the year 2016 are as follows:

a. Procurement of Activities:

- Registering of garages & service stations
- Registering of suppliers

b. Vehicle repairs and maintenance 2016

Table 4.2.3: Vehicle repairs and recommendations given

Location of workshop	Major Repairs	Minor Repairs	Recommendations	Work in Progress	Total
Kundasale	25	85	45	15	170
Head Office	-	271	1057	-	1328
Polonnaruwa	17	17	10	03	47

Location of workshop	Major Repairs	Minor Repairs	Recommendations	Work in Progress	Total
Angunakolapelessa	20	140	200	-	360
Sita Eliya	8	104	42	16	162
Total	**70**	**617**	**1354**	**34**	**2067**

c. Procurement of Machinery and Equipment

Table 4.2.4: Value of Goods Procured by the Engineering Division in 2016

Division	Total Expenditure (Rs.)
Office of the Additional Director General of Agriculture (Research)	43,545
Field Crop Research & Development Institute	3,547,438
Horticulture Crop Research & Development Institute	22,315,957
Fruit Research & Development Institute	2,295,252
Rice Research & Development Institute	8,281,218
Natural Resources Management Centre	404,040
Seed Certification & Plant Protection Center	14,753,668
Seed & Planting Material Development Center	234,020,988
Socio Economics & Planning Center	667,290
Extension & Training Division	25,161,083
Information & Communication Centre	200,409
Engineering Division	4,144,000
Finance Division	378,376
Progress Monitoring & Evaluation Unit	497,743
Value of Total Procurements of Goods	**316,711,006**

Table 4.2.5: Value of total capital works handled by the Engineering Division

Capital Work	Value (Rs.)
Civil Engineering Constructions	677,988,852
Procurement of Equipment	316,711,006
Total	**994,699,858**

Water Supply Scheme at Kundasale

This scheme pumps approximately 200,000 gallons of water from the Mahaweli river daily. The pumping station works 18 hours per day. This system caters to the various institutions under DOA as well as non-DOA premises. Chlorinated water is supplied for drinking and domestic usage throughout the year while non chlorinated water is supplied to the lake of the agriculture farm during drought period according to the requirement.

The system is 45 years old and has been rehabilitated introducing new purification system and pumping system in order to maintain reliable drinking water supply.

Other Services

The Engineering Division assisted many Institutes, Centers and Units of the DOA by preparing estimates for building construction and repairs, supervising the work and scrutinizing and recommending of estimates for repair of vehicles, equipment and machinery. Inspection and valuation of condemned vehicles, machinery and equipment is also carried out by the division. The division actively participated in technical evaluation and provided advisory services to the tender boards.

Development of IT infrastructure has been done including LANs in Finance Division, Administration Division, Extension & Training Division and Engineering Division, which provide benefits such as improving the effectiveness of communication, reduce printing and associated costs etc.,

Staff of the Engineering Division

Technical assistants (NVQ Level 5 qualified) in all three areas; civil, mechanical & electrical were recruited to the Division at the end of 2014 and it helps to increase the performance of the activities. Compared to the previous years a huge amount of jobs were completed in year 2016 and financial value is listed in the Table 4.2.2. This reflects the effect of availability of required technical staff. Old buildings in Head Office premises and many other buildings in outstations were renovated during short period of time. Further renovations and new constructions were done with modern architectural designs too. In order to expedite the civil constructions and maintenance, 02 Nos of Engineering Assistants and 12 Nos of Technological Assistants are located to cover island wide agriculture institutes.

PLAN FOR 2017

- Development of infrastructure facilities of the Engineering Division
- Applying productivity concepts to office procedures

STAFF LIST

Designation	No. Approved	No. Existing
Chief Engineer	01	01
Mechanical Engineer	05	05

Designation	No. Approved	No. Existing
Civil Engineer	04	04
Electrical Engineer	01	01
Administrative Officer	01	02
Engineering Assistant	11	09
Development Officer	05	07
Public Management Assistant	15	12
Technological Assistant	21	13
Driver	06	07
Store man	02	03
Mechanic	21	20
Electrician	03	04
Machinist	05	06
Carpenter		02
Mason		00
Technician	Technician 12	05
Welder		02
Water Pump Operator		01
Office Employee	02	01
Watcher	06	07
Labourer	22	13
Total	**143**	**125**

4.2.1 FARM MECHANIZATION RESEARCH CENTER (FMRC) – MAHAILLUPPALLAMA

Farm Mechanization Research Center is located within the Mahailuppallama agricultural complex, about 35km from Anuradhapura. FMRC has been established to promote appropriate farm mechanization in Sri Lanka by introducing farm mechanization technology to reduce cost of production, improve quality, enhance productivity and increase volume of agricultural product.

The major objectives of FMRC is to introduce effective agricultural mechanization technologies compatible with the socio economic and field conditions prevailing in different parts of the Sri Lanka. The activities carried out by FMRC are as follows.

- Identifying mechanization needs according to priorities & constraints in different farming systems.
- Selection & testing of promising machinery & implements with regard to their constructions, functions, safety, economic & sociological factors.
- Development, modification & adaptation of agricultural machinery & implements to suit local conditions.
- Prepare technical drawing, test report & instruction manuals for selected implements.
- Transfer technology to local manufacturers & enhance their capabilities in production of appropriate agricultural machinery & implements.
- Helping agricultural extension & other agencies to popularize agricultural mechanization, technologies among farmers & other users.

The center has 06 sections

1. Research & development section.
2. Testing & evaluation section.
3. Agricultural & industrial extension section.
4. Farm machinery maintaining & Repairing section
5. Technology transfer unit.
6. Administrative section

BUDGET

The allocation and expenditure under different votes for 2016 are given in Table 4.2.1.1.

Table 4.2.1.1: Annual budget – 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	1,884,577	1,801,225	96
Capital	2,800,000	2,765,838	99
Projects			
• National Food Production Program	150,000,000	110,518,309	74
Total	**154,684,577**	**115,085,372**	**74**

PROGRESS

Research & Development

Table 4.2.1.2: Research projects & Progress during the year 2016

Project Title	Aim of the Project	Progress during 2016
Manual Multi Chopper	Design and develop a manual Multi Chopper to make compost by using organic materials	Completed
Pulse Processing Machine concave modification	Modification for the Pulse Processing Machine to split seeds of Green gram and Black gram	In progress
Manual Finger Millet Seeder	Design and develop manual Finger millet Seeder for row seeding.	In progress
Independent adjust OFC Seeder for 4W Tractor	Designed and develop independently adjusting OFC Seeder for 4w Tractor for Soya, Maize, Black gram and Green gram in highland	Completed
High Capacity Finger Millet Thresher	Design and develop wheel mounted high capacity Finger millet Thresher with 450 kg/h capacity and easy transportation	Completed
Power Tiller attached 3 row Seeder	Design and develop Power Tiller attached 3 row Seeder for Soya, Maize, Black gram and Green gram on highland	Completed
Compost Mixer	Design and development of Compost Mixer	In progress
Vacuum Metering Seeder	Design and development of Vacuum Metering Seeder for precise seeding and less seed damage	In progress
Seed Counter	Introduce a Seed Counter to seeder outlet for precise metering	In progress
Power Weeder wheel modification	Modify the Power Weeder wheels to suit for 30 cm row spacing	Completed
Disc type rotary seeder	Modify the metering system of existing rotary seeder to disc type system for precise seeding	Completed
Groundnut Decorticator	Design and development of Groundnut Decorticator	Testing
Groundnut Pod Remover	Design and development of throwing type Groundnut Pod Remover	In progress
Multi crop thresher Drum modification	Improve the threshing drum of the existing Multi Crop Thresher for efficient threshing	In progress
Paddy Nursery Seeder	Design and develop Paddy Nursery Seeder to prepare nursery for Transplanter	In progress

Testing & Evaluation

The 3rd annual general meeting of ANTAM (Asia & Pacific Network for Testing of Agricultural Machinery) was successfully conducted in Sri Lanka. Fourteen member countries were participated for the meeting and other organizations such as Organization for Economic Cooperation & Development (OECD), Food & Agricultural Organization and Italian Agency for Agricultural Mechanization (ENAMA) were participated.

Sri Lanka was elected as the Chair for ANTAM in this conference and two (02) test codes were adapted.

By participating General Councils of ANTAM and technical working groups, successfully contributed to develop new standard test codes and procedures.

Following machines were tested and certified to the suitability for Sri Lankan Farming condition.

Table 4.2.1.3: Machineries tested & certified

Type	Number of machines tested	Number of machines certified
Four wheel tractor	03	02
Two wheel tractor	07	04
Water Pump	10	07
Transplanter	06	01
High Pole Saw	-	01

Agricultural and Industrial Extension

A. Extension programs during the year 2016

Table 4.2.1.4: Extension programs conducted during 2016

Activity	No. of programs
Filed demonstrations	18
TV programs	01
Radio programs	06
Exhibitions	07
Training programs	06
Newspaper Articles	02

B. Contribution to National Food Production Program

Provided technical assistance for distribution of farm machinery under National Food Production Program.

Table 4.2.1.5: Technical assistance provided under the national food production program

Name of the Machine	No. of Machines	Amount (Rs. Mn.)
Riding Type Transplanter	04	9.19
Walk Behind Type Transplanter	113	61.02
	200	110
Lowland Power Weeder	256	24.32
	1000	89.70

Name of the Machine	No. of Machines	Amount (Rs. Mn.)
Box Seeders	33	0.56
Cono Weeders (Manual)	1000	3.75
Groundnut Decorticators	15	3.82
Powered Disc plough	122	8.25
Maize Thresher – 2W Tractor Driven	10	1.67
Brush Cutter	650	9.01
4W Tractor Highland Seeder	30	5.37
Rotary Inter Cultivator	75	3.0
Total		**329.66**

Farm Machinery Maintaining & Repairing Section

Farm Machinery Maintaining & Repairing section of FMRC carryout possible repairs, gives technical guidance and give recommendations regarding repairs for vehicles and farm equipment belong to Department of Agriculture.

Table 4.2.1.6: Farm machinery repair recommendations given & repairs conducted

Activity	Total
Number of Recommendations	90
Number of Repairs	46

PLAN FOR 2017

Research & Development

- Pulse processing machine modification
- Manual finger millet seeder
- Compost mixer
- Vacuum metering seeder
- Seed counter
- Groundnut decorticator
- Groundnut pod remover
- Multi crop thresher
- Paddy nursery seeder
- Riding type 3 row OFC seeder
- Big onion bulb grader
- Vacuum metering seeder power marker for vacuum rotary seeder

Testing & evaluation

Testing of Agriculture machines handed over by suppliers and conduct awareness programs

- Four wheel Tractor - 03
- Four wheel implements - 06
- Two wheel tractors - 04
- Two wheel implements - 02
- Water pumps - 08
- Transplanters - 05
- Brush cutters - 11
- Sprayers - 12
- Mammoty - 05
- Weeders - 03
- Combine harvester - 01
- Augers - 02
- Seeders - 02

Agricultural & Industrial Extension

- Conduct field demonstrations and awareness programs as per the requests made by extension offices and participating agricultural exhibitions.

STAFF LIST

Designation	No. Approved	No. Existing
Deputy Director	-	01
Mechanical Engineer	03	03
Program Assistant (Agriculture)	02	-
Development Officer	02	-
Agricultural Instructor	02	02
Public Management Assistant	03	02
Technological Assistant (Extension)	-	03
Technological Assistant (Mechanical)	02	05
Driver	04	03
Tractor Operator	02	-
Store man	01	01
Mechanic	08	03
Machinist	06	05
Carpenter	02	01
Tinker	-	01
Plant Helper	01	01
Technician	07	05
Foreman (Engineering)	04	-
Office Employee	01	01
Watcher	04	03
Unskilled Laborer	11	26
Contract Laborer	15	02
Total	**80**	**68**

4.3 FINANCE DIVISION - PERADENIYA

The main objective of the finance division is establishment and operation of a sound financial management system to achieve the objectives of the Department of Agriculture such as,

- Preparation of annual revenue and expenditure estimates.
- Maintenance of Bank accounts.
- Allocation of Departmental and Ministry provisions.
- Collection and accounting of revenue of the Department.
- Make all recurrent and capital expenditure including personal emoluments.
- Performing internal audit activities.
- Preparation of financial progress reports and evaluation.
- Co – ordination of financial activities with local, and foreign, government and non-government organizations
- Foreign payments.
- Implementation of Farm Advance account activities.
- Preparation of final accounts including appropriation and Revenue accounts.
- Conducting annual Board of Survey.
- Payment of loans to employees.
- Training of personnel on computer application and financial management.

PROGRESS

Capital Expenditure

Table 4.3.1: Capital expenditure - 2016

Project	Project Description	Revised Estimate (Rs.)	Expenditure (Rs.)	Progress (%)
285 – 1 – 1	Administration & Establishment Services	31,700,000	28,843,000	91
285 – 2 – 2	Agriculture Research & Development	458,800,000	360,808,000	79
285 – 2 – 3	Agriculture Extension & Training	380,000,000	364,869,000	96
285 – 2 – 4	Seed Certification & Plant Protection	670,500,000	610,786,000	91
Total		**1,541,000,000**	**1,365,306,000**	**89**

Recurrent Expenditure

Table 4.3.2: Recurrent expenditure - 2015

Project	Project Description	Revised Estimate (Rs.)	Expenditure (Rs.)	Progress (%)
285 – 1 – 1	Administration & Establishment Services	424,502,000	415,784,000	98
285 – 2 – 2	Agriculture Research & Development	1,490,000,000	1,460,514,000	98
285 – 2 – 3	Agriculture Extension & Training	1,185,380,000	1,149,031,000	97
285 – 2 – 4	Seed Certification & Plant Protection	1,199,375,000	1,158,895,000	97
Total		**4,299,257,000**	**4,184,224,000**	**97**

Expenditure under other Institutes

Table 4.3.3: Expenditure under other institutes

Head	Name of the Institutes	Expenditure up to December (Rs.)
01	His Excellency the President	150,000
118	Ministry of Agriculture	967,412,000
253	Department of Pensions	17,441,000
281	Department of Agrarian Development	225,000
160	Ministry of Environment	197,000
Total		**985,425,000**

Operation of Advance Account Activities

Table 4.3.4: Operation of Advance Account (Debits) – 2016

Description	Amount (Rs.)
1. Maintenance of Agricultural Farms	
Total Debits	685,756,000
2. Public Officers Advance Account	
Total Debits	259,869,000
Total	**945,625,000**

Table 4.3.5: Operation of Advance Account (Credits) – 2016

Description	Amount (Rs.)
1. Maintenance of Agricultural Farms	
Total Credits	522,231,000
2. Public Officers Advance Account	
Total Credits	190,352,000
Total	**712,583,000**

Operation of Deposit Account Activities

Table 4.3.6: Operation of Advance Account– 2016

Description	Amount (Rs.)
Total Debits	232,251,000
Total Credits	490,170,000

Operation of Revenue Account

Table 4.3.7: Collection of revenue - 2016

Revenue Head	Category	Actual Receipts (Rs.)
20 - 02 - 02 - 99	Loan interest	16,962,000
20 - 03 - 99 - 00	Other receipts	79,072,000
20 - 02 - 01 - 01	Rent and others	25,846,000
20 - 03 - 02 - 18	Department sale & Other charges	303,596,000
20 - 04 - 01 - 00	W & O.P	119,186,000
20 - 06 - 02 - 00	Sale of Capital assets	1,415,000
20 - 03 - 04 - 00	Sundries	4,652,000
Total Credits of revenue		**550,729,000**

STAFF LIST

Designation	No. Existing
Chief Accountant	01
Chief Internal Auditor	01
Deputy Director (Finance)	03
Assistant Director (Finance)	07
Translator	01
Budget Assistant	02
Development Officer	32
Public Management Assistant	74
Driver	06
Office Employee	09
Unskilled Laborer	11
Total	**147**

4.4 PROGRESS MONITORING AND EVALUATION UNIT (PMEU) – PERADENIYA

The PMEU is responsible for monitoring and evaluation of activities and development programs conducted by all institutes and centers of DOA. In addition it holds the responsibility of preparing Annual Action Plans, Procurement Plans, Annual Performance Report, monthly progress reports and other relevant reports of the DOA for the Ministry of Agriculture and other institutes. Progress review meetings are also convened by the PMEU in order to streamline the activities of the DOA.

PMEU which was established in 1992, has now been relocated with required infrastructure at the head office premises.

BUDGET

Table 4.4.1: Annual budget - 2016

Vote	Allocation (Rs.)	Expenditure (Rs.)	Expenditure (%)
Recurrent	714,715	674,761	94
Capital	1,208,498	1,162,601	96
Total	**1,923,213**	**1,837,362**	**96**

PROGRESS

Compilation of Action Plans

Action plans for the year 2016 were compiled under following categories.

- Capital expenditure
- Recurrent expenditure
- Special projects funded through DOA
- Special projects funded through the Ministry of Agriculture
- Technical program of the DOA (Technical Action plan appeared incomplete owing to the fact that a part of recurrent allocations from the budget estimate was retained by the Chief Accountant without being distributed among the Divisions at the beginning of the year)
- Procurement plan of the DOA

Progress Monitoring of Capital and Recurrent expenditure

Monitoring the physical and financial progress of capital work and recurrent expenditure was continued during 2016. Monthly progress reports on each for Capital and Recurrent expenditure were prepared and submitted to the Ministry of Agriculture.

Table 4.4.2: Summary of progress of DOA during 2016

Vote	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)
Recurrent	4,299.0	4,182.0	1.5
Capital	514.8	440.0	32.1
Projects under DOA votes	908.5	798.0	39.2
Projects under Ministry of Agriculture votes	542. 8	184.4	83.3
Total	**5,722.30**	**5,604.4**	**156.1**

Progress Monitoring of Special Projects

Special Projects under DOA votes

Progress of 15 special projects under DOA votes was monitored and monthly reports including physical and financial progress were submitted to the Ministry of Agriculture. Financial progress of special projects under DOA votes is given in Table 4.4.3.

Table 4.4.3: Progress of special projects under DOA votes during 2016

Vote No.	Project Title	Institute	Allocation (Rs Mn.)	Bills in hand (Rs Mn.)	Expenditure (Rs. Mn.)
285-02-02-2-2502	Infrastructure development of Rice Research & Development Institute	RRDI	50		42.42
285-02-02-8-2502	2.Development and production of seeds of open pollinated other field crop varieties and new hybrid Chilli, Maize, Onion and vegetable varieties	FCRDI	55	3.33	69.67
		HORDI	10	129.0	
		FRDI	10	0.15	
285-02-02-12-2502	Post harvest management and value addition for fruits & vegetables	HORDI	61		29.64
285-02-02-9-2502	4. Establishment of 100 Fruit Villages	FRDI	15		12.9
285-2-2-10-2502	5. Establishment of Bio - Diversity Garden of Tropical Fruits	FRDI - Horana	16		13.44
		FRDI - Kundasale	07		
		FRDI - Homagama	02		
285-02-02-7-2502	6. Implementation of Soil Conservation Act	NRMC	05	0.03	4.24
285-02-03-8-2502	7. Agriculture School Development	ETC	70		70.1
285-02-03-4-2502	8. Media Program	ICC	05		29.79
		FBS	12		
		NAICC	10		
		PU	03		
285-02-03-7-2502	9. Agro Technology Parks – Gannoruwa & Bata atha	ICC - Gannoruwa	02		4.32
		ICC – Bata atha	2.5		

Vote No.	Project Title	Institute	Allocation (Rs Mn.)	Bills in hand (Rs Mn.)	Expenditure (Rs. Mn.)
285-02-04-1-2502	10. National seed production & purchasing program	SPMDC	295	1.16	294.94
285-02-04-5-2502	11. Accelerated seed farm development program	SPMDC	112	2.47	102
285-02-04-9-2502	12. Increasing production of local seed potato	SPMDC	45	0.4	38.15
285-02-04-4-2502	13. Ensuring quality seed & planting material production through implementation of Seed Act	SCPPC	14		13.64
285-02-04-8-2502	14. Minimize potential adverse effects of agrochemicals on human health and environment	SCPPC	05		4.99
285-02-04-7-2104	15. Strengthening seed certification activities	SCPPC	102	30.37	67.85
Total			**908.5**	**39.2**	**798**

Special Projects under Ministry votes

DOA received allocations from Ministry of Agriculture for different projects. The financial progress of those projects is given in Tables 4.4.4 and 4.4.5.

Table 4.4.4: Progress of special projects under Ministry votes during 2016

Vote	Project	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)
118-02-03-20-2502	1. 'Wasa vis nethi ratak' agricultural exhibition - 2016	ICC	1.569	1.564	
118-02-03-20-2502	2. Establishment of a new agricultural technology demonstration unit	ETC	6.0	2.11	
118-02-03-21-2502	3. Promotion of production & utilization of compost	RARDC - Makandura	5.0	4.98	
		ICC (NAICC)	7.0	6.83	
		ICC (PU)	1.0	0.99	
		ETC	6.30	5.06	
118-02-03-27-2502	4. Big Onion seed production program	ETC	16.90	3.43	0.01
118-02-03-31-2502	5. Skill development program	ETC	50.0	36.54	0.13
118-02-03-38-2502	6. Increasing availability of quality seed paddy through introduction of self seed paddy production	ETC	217.46	5.825	

Vote	Project	Institute	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Bills in hand (Rs. Mn.)
118-02-03-38-2502	7. Soya bean production program	ETC	23.06	14.393	5.1
118-02-03-38-2502	8. Facilitating availability of basic seeds (Paddy, OFC, vegetables & Potato) for certified seed production	SPMDC	70.0	45.96	26.48
118-02-03-38-2502	9. Increasing availability of basic seeds of other filed crops & vegetables through development of infrastructure of Seed Farms and sharing of facilities with private sector for standard & certified seed production	SPMDC	95.5	43.1	29.97
118-02-03-38-2502	10. Increasing production of planting material through infrastructure development of seed farms & selected nurseries	SPMDC	33.0	10.51	17.94
Total			**542.78**	**184.4**	**83.27**

Rs. 2,000 million had been allocated for the Ministry of Agriculture through the Budget Speech and out of that Rs. 1,562.43 million was allocated to the Department of Agriculture. Progress of projects implemented with this allocation under the National Food Production program is indicated in Table 4.4.5.

A Monitoring Cell has been established on 03.06.2016 under the direct supervision of the Director General of Agriculture for reporting the progress of the National Food Production program. The activities carried out until then in respect of the National Food Production program by the Progress Monitoring & Evaluation Unit were properly handed over to the said unit on 09.06.2016.

Table 4.4.5: Progress of projects under the National Food Production program under Ministry votes

Thrust area	Project	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
Crop Production	Paddy	67.5	67.3	100
	Maize	60.8	53.7	88
	Groundnut	22.9	7.7	34
	Green Gram	11.05	5.1	46
	Big Onion	22.4	15.2	68
	Red Onion	20.0	1.9	10
	Chilli	153.3	112.4	73
	Potato	328.3	132.6	40
	Gingelly	8.7	2.2	25
	Black Gram	4.8	3.0	63
	Cowpea	6.6	3.9	59
	Finger Millet	6.2	2.9	47
	Fruit Village	194.0	139.3	72
	Home Gardening	191.5	128.7	67
	Vegetables	38.3	28.7	75
	Sub Total	**1,136.4**	**704.5**	**62**
Acts & Regulations	Preparation of regulations for quality assurance of food items (SCPPC-ROP)	1.0	0.96	96
	Plant Variety Protection Act (SCPPC-PGRC)	0.05	0	0
	Testing of seed available in the market for seed quality (SCPPC-SCS)	1.5	0.85	57

Thrust area	Project	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
Consumer health & satisfaction	Establishment of a Mechanism to ensure quality & safety of agricultural commodities to through GAP (ETC)	29.5	29.5	100
	Promotion of healthy food (ETC)	7	6.3	90
Food security	Promotion of environmentally friendly pest & disease management system – (PPS)	9.4	5.3	56
	Efficient Plant Quarantine Services provided to the importers, exporters and other agriculture stakeholders for economic development – (NPQS)	30.9	30.9	100
	Development of a system for quality control of pesticides & residue analysis/ Implementation of pesticide & residue identification program (SCPPC-ROP)	20.0	19.8	99
	Establish a National pesticide Residue Monitoring program for fresh fruits and vegetables in Sri Lanka including exported & imported consignments - (SCPPC -ROP)	7.3	7.3	100
Input mgt	Application of mechanization technology(ENG) - 150Mn	120.2	94.2	78
Natural Resource Mgt	GIS mapping for progress mapping (NRMC)	1.0	0.66	66
	Recommendation of crops for different agro ecological regions (NRMC)	2.5	0.7	28
	Establishment of sustainable land management strategies (NRMC)	11.5	11.5	100
	Implementation of soil conservation interventions (NRMC)	14.0	13.15	94
	Soil and water security through implementation of conservation strategies (NRMC)	11.5	4.2	37
	Long-term climate forecasting and introduction & promotion of crop cultivation based on climatic predictions (NRMC)	4.5	3.7	82
	Conservation of agro biodiversity(SCPPC – PGRC)	2.9	2.6	90
Youth & Women participation	Change present food patterns through 'Hela bojun' (ETC)	60.6	36.0	59
Sub Total		**335.2**	**267.7**	**80**

Thrust area	Project	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
Research	Development of Brown plant hopper, and Gall midge resistant rice varieties (RRDI)	4.5	4.4	98
	Development of bacterial leaf blight resistant rice varieties (RRDI)	1.0	1.0	100
	Productivity improvement of rice (RRDI)	10.5	10.4	99
Research	Technological interventions to improve production and p0roductivity of selected vegetables (HORDI Gannoruwa)	19	16.8	88
	Technological interventions to improve production & productivity of flower crops (HORDI Bandarawela)	5.1	3.1	61
	Enhancement of productivity of fruit crops by managing major pest problems (FRDI)	1.5	1.4	93
	Reduce the fertilizer use through site specific fertilizer recommendation for Papaya & Passion fruit (FRDI)	0.2	0.1	50
	Development of *in-vitro* techniques for healthy Mandarin planting material production (FRDI)	0.5	0.4	80
	Development of Panama disease resistant/ tolerant mutants through tissue culture (FRDI)	1.0	1.1	110
	Development of a package to minimize post harvest losses for selected fruit crops -Pineapple, Avocado, Guava, Annona, Passon fruit & Rambutan - (FRDI)	3	2.7	90
	Development of a rapid detection technologies for identification of fruit crop diseases by using molecular methods (FRDI-PVIC)	2.0	2.0	100
	Creating new variants of exotic grapes through tissue culture technology for future varietal development (FRDI-PVIC)	2.0	1.9	95
	Study the behavioral changes of reproductive and productivity parameters of major fruit crops, under a changing and variable climate in different agro-ecological regions in Sri Lanka (FRDI-FCRDS Gannoruwa)	4.0	1.3	33
	Technological intervention to improve production & productivity of selected fruits (Citrus) (FRDI-FCRDS Rahangala)	1.7	3.1	182

Thrust area	Project	Allocation (Rs. Mn.)	Expenditure (Rs. Mn.)	Expenditure (%)
Research	Technological interventions to improve production & productivity of selected fruits (Strawberry) – (FRDI-FCRDS Banadarawela)	2.5	3.4	136
	Productivity enhancement of Finger millet (FCRDI)	1.4	1.2	86
	Productivity enhancement of Black gram & Mung bean- (FCRDI MI)	1.0	0.97	97
	Productivity enhancement of Maize- (FCRDI MI)	0.5	0.4	80
	Productivity enhancement of Chilli-(FCRDI MI)	6	4.7	78
	Productivity enhancement of Groundnut (FCRDI MI)	3	0.4	13
	Technology dissemination component of productivity enhancement -(FCRDI)	1.7	1.7	100
	Post harvest value addition of fruits for reducing the gap between farm gate price and market price (FCRDI)	1.2	1.2	100
	Research for conservation of fruit crop germplasm through cryopreservation and enriching field gene bank – SCPPC (PGRC)	10.7	11.2	105
	Development of package of practices to produce quality seeds of Cucurbits, Brinjal, Tomato, & Capsicum- SCPPC (SCS)	4.0	4.0	100
	Enhancement of OFC, vegetables & fruits during off season & non convectional area as an adaptation measure to climate (NRMC)	3.0	2.2	73
	Sub Total	**90. 9**	**80.9**	**89**
	Grand Total	**1,562.7**	**1,053.3**	**67**

PU – Publication Unit

Achievements of DOA

Achievements of DOA in the year 2016 were compiled and submitted to the Ministry of Agriculture and the Central Bank for inclusion in the progress report for the parliamentary Budget speech and the Annual Report of the Central Bank.

Annual Performance Report

Annual Performance Report of the DOA for the year 2015 was prepared and submitted to the Ministry of Agriculture. It is also distributed to relevant Ministries, Universities, libraries and other relevant institutions.

Other Reports

Progress reports of projects of which the total allocation exceeds Rs. 50 million were prepared and submitted to the Ministry of Agriculture.

Human Resources Availability

Ms. Nilanthi Wijethilake (Translator – English/ Sinhala) and Ms Shermila Ekanayake (Translator – English/ Sinhala) transferred out from the Department of Agriculture and Ms. Chandrika Thilakaratne (Public management Assistant) transferred to another division of the DOA.

Ms. Kanchana Ratwatte (Translator – English/ Sinhala), Ms. D.N. Sandamali (Development Officer), Ms. M.M.G.N.S. Weerasekara (Development Officer), and Ms. P.S.P. Nilmalgoda (Agriculture Instructor) assumed duties at the PMEU during 2016.

PLAN FOR 2017

- Compilation of Action plans, Procurement plans for Capital expenditure and special projects of the DOA.
- Preparation of progress reports of Capital and Recurrent expenditure of the DOA.
- Preparation of progress reports of special projects under DOA and Ministry votes.
- Compilation and publishing of Annual Performance Report of the DOA.
- Preparation of reports on achievements of the DOA for the Performance report of the Ministry of Agriculture, Annual report of the Central Bank and for the parliamentary budget speech.
- Preparation of Technical Action Plan and Technical progress of the DOA.

STAFF LIST

Designation	No. Existing
Deputy Director	01
Translator (English-Sinhala)	03
Translator (English-Tamil)	01
Program Assistant (Agriculture)	01
Development Officer	05
Agriculture Instructor	01
Public Management Assistant	02
Technological Assistant	02
Driver	03
Office Employee	01
Laborer	02
Laborer (Contract)	01
Total	**23**

5. WEATHER REPORT

Meteorological data collected from 13 agro-meteorological stations representing different agro-ecological regions in Sri Lanka during 2015/2016 Maha (September – February) and 2016 Yala (March – August) seasons have been summarized in this report. This report has been compiled by the Agro-climatology & Climate Change Division, Natural Resources Management Center (NRMC) of the Department of Agriculture.

The cumulative seasonal rainfall of both seasons is given in the Table 5.1. The monthly total rainfall and corresponding 10-year averages of 13 stations are given in Tables 5.2 and 5.3, respectively. Monthly mean values of other important agro-meteorological parameters, namely, potential evapotranspiration (estimated from open pan evaporation), maximum and minimum air temperature, relative humidity, bright sunshine hours and wind velocity are given in Tables 5.4, 5.5, 5.6, 5.7 and 5.8, respectively.

At the first half of the 2015/2016 Maha season, the cumulative monthly rainfall in almost all regions of the country was above the expectations. However, at the tail end of the season; in January and February the amount and distribution of rainfall in almost all regions of the country was relatively low compared to the long term average. In general, there was a negative anomaly of cumulative rainfall of 2016 Yala season in almost all parts of the country, especially due to weak Southwest monsoonal circulation. This anomaly was evident in all months of the season except in May during which heavy rains were experienced throughout the island in three days in the mid of the month resulting severe natural disasters, both landslides and floods.

Low Country Wet Zone

Bombuwela (WL_{1b})

The cumulative seasonal rainfall of this region during 2015/2016 Maha season was above the expectation, receiving over 36 percent compared to its long term average of 1,482 mm. This positive anomaly of rainfall in the Maha season was a result of above normal rains received in each month of the season except in October and January. The increase of cumulative monthly rainfall in December was about 169 percent compared to its long-term average. Meanwhile, the received cumulative rainfall during each month of the season was well in excess of the potential evapotranspiration values throughout the season.

In this region, the seasonal cumulative rainfall of 2016 Yala season was about 25 percent decrease compared to its long term average of 1,651 mm. The recorded negative anomaly is mainly due to the reduction of rainfall during each month of the season except May compared to its long term average. However, cumulative potential evapotranspiration values were remained well below the cumulative rainfall of each month except August, and thus, there was no threat of developing soil moisture stress conditions in any crop grown in highlands.

Mid Country Wet Zone

Peradeniya (WM_{2b})

The recorded cumulative seasonal rainfall in WM_{2b} region, of 2015/2016 Maha season was about 1,412 mm. Compared to the long-term average, it was a 14 percent increase. This positive anomaly of rainfall was a result of above normal rains received in each month of the season except in conventional dry months, namely January and February. January was exceptionally dry, experiencing hardly any rainfall during the month and at the same time monthly rainfall in February was only about 5 mm. Moreover, the potential evapotranspiration during January and February was considerably higher reporting 97 mm and 104 mm, respectively. However, this dry condition may have been a conducing environment for flower setting of tree-fruit crops in the region.

The Yala season in this region experienced above normal rains with about 17 percent increase compared to its long term average of 949 mm. However, it was merely due to the receipt of heavy rains in mid-May and rest of the month of the season experienced a negative anomaly. The monthly rainfall in May was about 749 mm and it is 519 percent increase compared to the long term average. Monthly cumulative rainfall in each month except in May was not sufficient even to meet the evaporative demand of the atmosphere. This is a very rare agro climatic phenomenon to experience during a Yala season in this region.

Up Country Wet Zone

Sita Eliya (WU_3)

Cumulative seasonal rainfall of 2015/2016 Maha season in this region was about 1,534 mm, which is about 31 percent increase over the long-term average. This increase was mainly attributed to above normal rains experienced during all months of the season except in January and February. The potential evapotranspiration in the area remained well below the received rainfall during the entire six months of the season. The maximum temperature during the season was ranged from 16.0 ^{0}C to 24.0 ^{0}C while the minimum temperature was in the range of 7.4 ^{0}C to 15.2 ^{0}C.

In contrast to the Maha season, this region experienced a below normal rainfall during the 2016 Yala season; which is 16 percent decrease compared to the long-term average of 804 mm. This negative anomaly was a result of below normal rainfall received in every month of the season except in mid-May and July. The potential evapotranspiration in the area remained well below the received rainfall during period of May to July. The maximum temperature during the season was ranged from 15.2 ^{0}C to 24.8 ^{0}C while the minimum temperature was in the range of 9.0 ^{0}C to 15.6 ^{0}C. However, below average rainfall during the season may have favored the vegetable cultivation in the area.

Low Country Intermediate Zone

Batalagoda (IL_{1a})

During 2015/2016 Maha season, the recorded cumulative seasonal rainfall in this region was about 1,114 mm, which is about 6 percent decrease compared to its long-term average. Every month of the season experienced below normal rains except in November and December. The decrease of cumulative monthly rainfall in January and February were

about 97 and 81 percent, respectively. However, the potential evapotranspiration values were remained well below the monthly rainfall during each month of the season except in January and February. Therefore, rainfed agriculture may have hardly experienced water deficit conditions at the vegetative phase of upland crops grown in the area.

As this region does not lie directly under the effective region of the Southwest monsoon, the reduction of rainfall in the Yala season was not observed as in the case of Wet Zone.

The recorded cumulative seasonal rainfall of 1,161 mm was 53 percent increase compared to its long-term average. Above normal rains were received during the months of May, June and July. The increase of cumulative monthly rainfall in May was about 367 percent compared to its long-term average.

Monaragala (IL_{1c})

The 2015/2016 Maha season in IL_{1c} region experienced a near normal rainfall regime of about 1,236 mm recording above normal rains in all months of the season except in September and January. The potential evapotranspiration values were also above the monthly cumulative rainfall during the same months.

In this region, the cumulative seasonal rainfall of the 2016 Yala season was 672 mm, a 10 mm increase compared to its long-term average. This increase was mainly attributed to the above normal rains experienced during the months of May and August. The increase of cumulative monthly rainfall in May was about 185 percent compared to the long term average due to heavy rains experienced in the mid of the month. Furthermore, the evapotranspiration demand of the atmosphere in March, May and August was below the cumulative seasonal rainfall. This situation may not have been favorable for both rainfed and irrigated upland agriculture in the region.

Mid Country Intermediate Zone

Kundasale (IM_{3a})

The cumulative rainfall of 2015/2016 Maha season in this region was about 15 percent increase compared to its long-term average of 1,034 mm. The recorded positive anomaly of the season was mainly attributed to the above normal rainfall received during the second inter-monsoon period and the early part of the north east monsoon. Meanwhile, potential evapotranspiration values were remained well below the monthly rainfall during the first four months of the season. Therefore, soil moisture stress was an unlikely event in highland crops grown within this region.

Compared to its long-term average of 558 mm, the seasonal cumulative rainfall of 2016 Yala season was also a 15 percent increase. This increase was mainly attributed to the above normal rains received during the mid period of May. The increase of cumulative monthly rainfall in May was about 479 percent compared to the long term average. Furthermore, the potential evapotranspiration values were also above the monthly rainfall during every month of the season except May. Hence, crops grown without supplementary irrigation may have suffered due to soil moisture stress conditions.

Up Country Intermediate Zone

Bandarawela (IU_{3c})

This region experienced about nine percent increase of cumulative rainfall during 2015/2016 Maha season compared to its long-term average, This positive anomaly was mainly due to the above normal rainfall experienced during the second inter monsoon period. The increase of cumulative monthly rainfall in September was about 131 percent and October was about 71 percent compared to their long term averages. However, the potential evapotranspiration values remained well below the rainfall of each month of the season except in January. The maximum temperature during the season was ranged from 20.5 ^{0}C to 28.5 ^{0}C while the minimum temperature was in the range of 9.9 ^{0}C to 19.9 ^{0}C.

During the 2016 Yala season, this region experienced about 503 mm of rainfall with a 24 percent of negative anomaly. This negative anomaly was prevailed throughout the season except in May as in the case of most other regions of the country. Furthermore, monthly cumulative potential evapotranspiration values were above the cumulative rainfall in each month of the season except in April and May. The maximum temperature during the season was ranged from 25.0 ^{0}C to 30.5 ^{0}C while the minimum temperature was in the range of 11.3 ^{0}C to 24.1 ^{0}C.

Dry Zone

Maha-Illuppallama (DL_{1b})

The cumulative Maha season rainfall in this region was 1,261 mm and it was a 20 percent increase over the expected amount due to the receipt of good rainfall throughout the season except at the tail end of the Northeast monsoon period. Meanwhile, potential evapotranspiration values also were remained well below the monthly rainfall during each month of the season except in January and February.

A 65 percent increase in cumulative seasonal rainfall of 2016 Yala season was observed in this region compared to its long term average of 414 mm. This positive anomaly was mainly due to the above normal rains experienced in mid-May. The rainfall received in May was 890 percent increase, compared to the long term monthly average. Thus, despite having above normal cumulative seasonal rainfall, usual rainfall deficit conditions were prevailed in other months of the season. Cumulative potential evapotranspiration values in all months of the season were in excess of the rainfall receipt except a few days in the month of May.

Angunakolapelessa (DL_{1b})

The cumulative seasonal rainfall of 2015/2016 Maha season in the southern part of the DL1b agro-ecological region was about 37 percent increase compared to its long term average of 838 mm. Except in January, all other months of the season experienced above normal rains in excess of cumulative potential evapotranspiration.

The 2016 Yala season was considerably dry and it was about 44 percent reduction in cumulative seasonal rainfall compared to its long term average of 475 mm. Similar to the most of the other regions of the country, below normal rains were observed in each month of the season except in May. Moreover, the potential evapotranspiration values during each month of the season were in excess of the

cumulative rainfall except in May. Thus, rainfed upland crops may have suffered from soil moisture stress conditions unless supplementary irrigation was provided.

Aralaganwila (DL_{2b})

In the eastern part of the Dry Zone, cumulative Maha season rainfall in 2015/2016 was 1,735 mm, which is only a seven percent increase compared to its long term average. This increase was mainly attributed to the above normal rainfall received during September, October and November. The increase of cumulative monthly rainfall in September was about 601percent compared to its long-term average. Evaporative demand of the atmosphere remained well below the cumulative rainfall in each month of the season except in February. Hence, there was hardly any chance of developing soil moisture stress conditions in crops grown on highlands.

The cumulative rainfall of this region in 2016 Yala season was about 382 mm and it was an 11 percent decrease compared to its long term average. This negative anomaly was a result of below normal rains observed in each month of the season except in May. During the month of June, no rainfall was recorded in this region. Also the potential evapotranspiration values were above for the cumulative rainfall in each month of the season except May. Usually, seasonal rainfall in Yala seasons is not favorable for successful rainfed agricultural production in this region.

Weerawila (DL_5)

The DL_5 agro-ecological region of the southern part of the Dry Zone recorded a near normal rainfall during 2015/2016 Maha season. The recorded 852 mm of rainfall was just a two percent increase compared to its long-term average. Meanwhile, cumulative monthly potential evapotranspiration values of the season were well below the cumulative rainfall of each month except in January and February. Thus, crops grown in this region may have suffered from soil moisture stress conditions during the latter part of the season if supplementary irrigation was not provided.

The recorded cumulative seasonal rainfall of 2016 Yala season in this region was about 332 mm, a 13 percent increase compared to its long term average. Recorded positive anomaly was mainly attributed to the above normal rains experienced during the months of May and July. However, only May can be considered as a wet month in this region as all other months of the season have not received monthly cumulative rainfall over 100 mm. The increase of cumulative monthly rainfall in May was about 440 percent compared to the long term average. Furthermore, the cumulative potential evapotranspiration values were in excess of the cumulative rainfall of each month except in few days of mid-May Thus, soil moisture stress conditions may have been a common problem in rainfed upland cultivations in this region where supplementary irrigation was not practiced.

Table 5.1: Total rainfall (mm) of 2015/2016 Maha & 2016 Yala seasons

Agro-met Station	Agro Ecological Zone	Maha 2015/16 Sep-Feb	Maha Ten Year Average (2005-14)	Yala 2016 Mar-Aug	Yala Ten Year Average (2005-14)
Bombuwela	WL_{1b}	2013.9	1481.6	1243.4	1650.8
Peradeniya	$WM_{2\,b}$	1412.2	1237.1	1115.6	948.9
Sita Eliya	WU_3	1533.6	1173.9	676.5	804.2
Bathalagoda	IL_{1a}	1114.5	1191.7	1161.5	756.4
Makandura	IL_{1a}	1152.7	1182.1	1157.6	978.3
Moneragala	IL_{1c}	1236.2	1261.5	672.5	612.1
Girandurukotte	IL_2	1798.3	1774.2	342.0	517.3
Kundasale	IM_{3a}	1191.2	1034.5	642.4	558.1
Bandarawela	IU_{3c}	1261.9	1162.7	503.3	666.0
MahaIluppallama	DL_{1b}	1261.1	1051.7	683.7	413.8
Angunakolapellessa	DL_{1b}	1150.2	838.0	263.9	474.7
Aralaganwila	DL_{2b}	1735.0	1627.4	382.3	430.3
Weerawila	DL_5	851.6	833.2	332.0	294.6

Table 5.2: Monthly total rainfall 2015/16 (mm)

Agro-met station	2015				2016							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	697.8	262.8	475.2	290.4	84.3	203.4	131.8	227.2	618.6	103.4	131.2	31.2
Peradeniya	168.6	631.4	310.9	296.3	0.0	5.0	112.4	73.7	748.7	80.9	66.4	33.5
Sita Eliya	277.2	475.8	331.3	320.3	52.5	76.5	55.9	55.5	330.5	67.8	126.5	40.3
Bathalagoda	95.5	303.2	385.3	315.0	3.2	12.3	118.8	203.0	641.6	101.0	88.6	8.5
Makandura	197.4	352.7	282.4	247.1	0.4	72.7	39.0	188.3	784.3	116.3	26.6	3.1
Moneragala	76.0	288.8	441.2	299.2	29.4	101.6	107.4	63.2	301.9	7.0	42.5	150.5
Girandurukotte	249.6	361.0	309.3	640.2	107.1	131.1	74.8	54.1	204.4	0.0	7.3	1.4
Kundasale	128.8	353.3	345.6	343.4	2.2	17.9	59.2	51.0	446.3	39.0	38.7	8.2
Bandarawela	240.8	536.6	232.0	152.6	40.8	59.1	64.0	82.8	263.5	0.0	36.0	57.0
MahaIluppallama	227.3	302.2	426.7	244.0	49.1	11.8	15.5	90.7	564.5	8.3	4.7	0.0
Angunakolapellessa	316.4	250.9	259.2	210.1	1.7	111.9	0.0	27.7	148.1	24.5	36.6	27.0
Aralaganwila	275.6	415.4	399.9	486.9	95.9	61.3	27.0	19.8	304.1	0.0	26.3	5.1
Weerawila	162.1	253.5	201.7	196.9	14.9	22.5	1.1	46.3	261.8	2.9	17.8	2.1

Table 5.3: Monthly average Rainfall in mm (2005-2014)

Agro-met station	Month											
	Sep	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	Aug
Bombuwela	259.8	455.6	379.1	195.2	90.9	103.4	192.8	328.9	407.5	306.0	170.6	245.0
Peradeniya	149.8	365.3	302.0	242.9	109.0	77.5	143.9	260.4	121.0	162.9	142.1	118.6
Sita Eliya	144.3	250.2	260.6	251.4	173.6	82.5	120.9	160.9	161.7	140.2	121.4	99.2
Bathalagoda	112.9	338.5	295.3	279.2	100.6	64.3	132.2	223.2	137.5	100.2	80.5	82.7
Makandura	173.4	422.4	285.0	172.7	66.0	73.3	154.7	211.0	210.0	198.5	83.9	120.2
Moneragala	89.5	286.8	365.0	256.6	179.6	79.1	108.7	247.1	106.1	19.3	50.0	80.9
Girandurukotte	71.9	241.3	403.7	529.5	345.6	175.2	128.2	198.8	57.7	13.5	39.6	69.1
Kundasale	83.5	260.5	254.6	241.0	121.1	75.7	91.9	170.5	77.1	87.9	60.5	70.2
Bandarawela	104.4	313.6	280.4	241.9	129.9	89.1	132.7	227.8	145.4	47.2	45.6	67.3
MahaIluppallama	66.0	269.8	288.3	239.1	111.6	73.4	112.0	176.6	57.0	8.0	19.9	40.4
Angunakolapellessa	82.3	170.1	240.4	196.7	100.4	44.1	106.7	126.5	82.3	51.6	37.8	69.9
Aralaganwila	39.3	271.7	377.2	495.4	285.9	144.9	91.2	140.9	70.0	14.0	40.9	73.3
Weerawila	35.9	181.7	267.4	206.5	96.7	49.3	73.0	103.3	48.6	17.6	14.6	38.0

Table 5.4: Monthly Potential Evapotranspiration (mm) - 2015/16

Agro-met station	2015				2016							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	52.8	59.5	60.0	59.5	69.4	71.9	94.2	86.4	62.0	64.8	71.9	79.4
Peradeniya	64.8	64.5	52.8	71.9	96.7	104.4	119.0	79.2	67.0	74.4	69.4	76.9
Sita Eliya	45.6	47.1	40.8	37.2	52.1	71.9	96.7	81.6	44.6	50.4	57.0	57.0
Bathalagoda	74.4	67.0	60.0	64.5	96.7	97.4	101.7	96.0	76.9	86.4	84.3	104.2
Makandura	86.4	86.8	72.0	81.8	96.7	92.8	111.6	103.2	79.4	86.4	76.9	99.2
Moneragala	88.8	71.9	67.2	62.0	79.4	78.9	99.2	103.2	109.1	98.4	89.3	94.2
Girandurukotte	93.6	76.9	45.6	49.6	59.5	71.9	91.8	96.0	91.8	108.0	111.6	124.0
Kundasale	72.0	64.5	62.4	64.5	76.9	78.9	114.1	88.8	67.0	62.4	74.4	81.8
Bandarawela	64.8	49.6	57.6	37.2	47.1	58.0	84.3	72.0	67.0	91.2	106.6	86.8
MahaIluppallama	88.8	64.5	45.6	44.6	62.0	67.3	104.2	105.6	94.2	91.2	104.2	124.0
Angunakolapellessa	72.0	79.4	67.2	81.8	116.6	104.4	138.9	132.0	67.0	105.6	131.4	138.9
Aralaganwila	98.4	91.8	64.8	62.0	62.0	71.9	106.6	120.0	104.2	141.6	133.9	156.2
Weerawila	86.4	96.7	69.6	84.3	89.3	92.8	124.0	115.2	86.8	120.0	148.8	86.4

Table 5.5: Maximum and Minimum air temperature (^{O}C) – 2015/16

Agro-met station	2015										2016													
	Sep		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		June		July		Aug	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Bombuwela	30.7	24.2	31.1	24.1	31.1	23.7	31.6	23.6	31.9	23.1	31.7	23.3	32.6	24.5	33.0	25.1	31.4	25.2	30.8	25.8	30.4	25.3	30.4	25.8
Peradeniya	29.6	22.0	29.4	21.6	28.7	21.6	29.1	22.1	29.9	20.4	31.0	21.1	33.0	21.6	32.6	23.0	29.9	22.2	28.8	23.0	29.3	22.5	29.1	22.9
Sita Eliya	19.3	13.4	19.9	13.6	19.7	13.4	19.0	12.8	19.9	11.4	20.5	11.8	22.5	11.8	22.8	12.7	20.0	14.3	18.2	13.8	18.5	13.3	18.5	13.2
Batalagoda	31.2	23.9	31.3	23.7	30.4	23.1	30.2	22.8	30.7	21.4	31.8	21.5	34.8	23.1	34.3	24.3	31.5	24.5	30.5	24.6	30.5	24.3	30.8	24.3
Makandura	30.9	24.5	31.2	24.2	30.9	23.9	30.8	23.3	31.9	22.3	33.9	23.0	34.7	24.5	34.8	25.2	32.1	24.7	31.2	25.5	31.4	24.8	31.5	25.5
Moneragala	34.4	21.3	32.4	22.5	31.1	22.4	30.6	22.6	31.3	21.9	32.9	22.5	35.2	22.0	35.4	23.5	33.1	23.7	35.3	23.0	36.2	21.6	35.8	21.5
Girandurukotte	*	25.8	32.7	24.6	31.4	22.3	30.9	22.9	30.6	22.3	31.8	22.5	34.6	23.0	35.7	25.4	34.9	27.1	35.2	27.1	35.0	26.0	36.0	24.5
Kundasale	30.8	21.4	30.3	21.5	29.7	21.1	29.6	21.1	30.0	20.1	31.0	20.1	33.8	20.3	33.7	22.0	30.8	22.4	28.7	21.2	30.1	22.0	30.5	22.1
Bandarawela	26.1	17.5	25.3	15.8	25.1	16.8	24.5	16.9	24.5	15.4	25.3	15.2	28.1	14.9	28.3	17.1	27.4	18.0	27.3	18.5	27.2	17.2	27.4	16.6
MahaIluppallama	32.6	23.9	31.6	23.1	30.4	22.8	30.1	22.6	30.5	21.0	32.3	21.8	35.6	23.0	35.9	24.8	32.5	24.9	31.7	25.2	32.5	25.0	33.3	25.1
Angunakolapellessa	31.4	24.2	31.6	24.1	31.6	23.8	31.5	23.7	32.9	22.9	32.9	23.3	34.3	24.0	35.0	25.5	33.2	25.4	33.1	25.6	33.9	25.3	33.8	25.5
Aralaganwila	34.0	22.4	32.2	22.1	30.8	21.9	30.1	22.1	30.1	20.8	31.3	20.9	34.2	21.1	36.5	22.4	33.9	22.4	34.3	22.6	34.3	21.6	35.1	21.7
Weeravila	31.0	25.3	31.1	24.6	31.2	24.2	31.2	23.3	32.4	23.8	33.0	24.6	34.0	24.8	34.0	26.2	32.6	25.6	33.0	25.7	34.1	25.0	34.7	24.5

* - Data Not Available

Table 5.6: Relative Humidity (%) – 2015/16

Agro-met Station	2015								2016													
	Sep		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		June		July		Aug	
	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
Bombuwela	88	83	86	80	86	79	86	78	86	71	83	73	80	70	79	70	85	79	83	78	85	78	81	76
Peradeniya	81	81	83	88	87	83	86	83	76	61	72	54	74	52	79	66	83	78	78	74	80	71	80	73
Sita Eliya	91	95	89	95	90	92	92	94	83	89	82	86	73	80	75	86	91	92	94	92	93	93	94	93
Batalagoda	79	71	83	80	87	78	86	76	81	64	83	62	80	48	82	57	83	75	80	74	80	72	76	65
Makandura	92	86	92	85	92	86	91	84	89	76	90	73	89	68	85	68	91	81	91	86	88	82	87	82
Moneragala	79	72	84	85	88	86	89	86	85	71	82	64	84	60	83	64	85	77	80	73	77	59	79	68
Girandurukotte	79	62	82	73	89	73	91	78	88	72	85	69	83	62	82	57	81	63	70	55	75	58	69	53
Kundasale	79	80	81	81	86	82	85	76	81	66	79	63	75	53	78	58	83	76	72	67	76	66	71	64
Bandarawela	73	78	79	85	82	81	85	81	82	72	76	75	69	57	76	67	89	91	70	66	59	63	63	55
MahaIluppallama	81	64	91	76	91	81	91	78	89	66	89	59	82	48	79	51	85	70	81	68	79	60	77	54
Angunakolapellessa	89	86	89	86	90	86	88	81	83	73	83	67	78	68	81	74	88	81	82	72	80	69	76	64
Aralaganwila	79	70	82	70	84	77	85	75	86	70	84	64	80	55	73	57	75	68	63	53	67	55	64	48
Weeravila	81	76	78	74	83	79	81	77	91	65	72	59	71	58	71	69	79	75	72	61	67	58	64	53

M - Reading at 8.30 hours
E - Reading at 15.30 hours

Table 5.7: Bright Sunshine Hours – 2015/16

Agro-met station	2015				2016							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	5.1	6.1	5.6	6.6	7.6	7.8	9.3	8.8	4.2	7.1	7.5	8.3
Peradeniya	5.5	5.0	3.7	5.2	7.7	7.6	8.5	7.7	4.1	5.3	6.0	7.1
Sita Eliya	2.5	3.1	2.3	2.9	5.3	6.2	7.6	7.9	2.7	3.0	4.4	4.8
Batalagoda	6.3	5.5	4.7	5.3	8.1	7.8	9.0	8.9	5.6	6.8	7.0	8.2
Makandura	*	*	*	*	*	*	*	*	*	*	*	*
Moneragala	*	*	*	*	*	*	*	*	*	*	*	*
Girandurukotte	5.8	4.5	3.3	2.8	4.4	5.4	7.2	8.2	5.3	5.2	4.7	7.0
Kundasale	6.0	4.9	4.8	4.3	5.3	6.1	7.1	6.3	6.2	7.2	7.3	6.9
Bandarawela	4.5	3.3	3.4	2.7	4.9	6.1	7.0	6.8	4.8	6.5	5.8	6.8
MahaIluppallama	8.3	6.0	4.4	4.6	7.4	7.5	9.3	9.9	7.1	7.6	8.3	9.5
Angunakolapellessa	4.8	6.3	4.6	5.2	7.3	6.2	8.2	7.8	4.5	5.9	7.1	7.9
Aralaganwila	7.8	6.1	4.4	4.3	6.2	7.4	9.0	9.0	6.9	7.9	8.3	9.7
Weeravila	5.6	6.5	5.1	4.4	7.9	7.4	8.5	8.0	5.6	7.6	7.8	8.0

* - Data not available

Table 5.8: Wind Velocity (kmph) – 2015/16

Agro-met station	2015				2016							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Bombuwela	2.4	1.3	1.0	0.8	0.8	2.0	3.5	3.2	2.1	*	*	5.2
Peradeniya	2.8	2.4	2.6	5.0	6.2	6.1	3.7	2.2	2.9	4.6	3.8	3.9
Sita Eliya	9.7	5.2	4.9	6.0	3.8	5.5	3.8	2.9	9.6	19.8	14.5	14.8
Batalagoda	5.2	3.0	2.9	3.1	5.3	*	*	*	*	*	*	8.8
Makandura	4.2	4.1	3.4	3.6	3.9	4.1	4.2	4.2	4.0	3.8	4.0	4.0
Moneragala	1.2	0.5	0.5	0.6	1.2	1.2	1.0	0.6	1.0	1.4	0.8	0.6
Girandurukotte	1.7	1.4	1.2	1.1	1.1	1.3	1.4	1.5	1.5	2.2	2.0	2.3
Kundasale	1.6	0.5	0.9	1.0	1.2	1.7	1.5	1.5	1.2	2.1	2.2	2.9
Bandarawela	4.7	2.7	2.8	2.8	3.1	3.6	3.4	3.0	3.6	6.9	5.6	4.7
MahaIluppallama	5.8	3.3	3.0	4.1	5.0	5.4	4.5	3.2	5.7	8.2	7.8	8.5
Angunakolapellessa	3.3	2.7	2.5	3.9	5.6	5.6	5.9	4.8	4.4	5.5	5.8	6.8
Aralaganwila	3.1	2.1	1.8	1.6	2.0	2.7	2.8	2.6	3.4	5.7	5.0	5.2
Weeravila	5.3	2.8	2.0	2.5	3.6	3.5	4.0	2.2	4.9	7.3	7.3	8.5

* - Data not available

6. PUBLICATIONS & PRESENTATIONS

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7. SENIOR STAFF

(As at 2016.12.31)

R.R.A. Wijekoon	Ph.D., Director General, of Agriculture, Digital Media Designing
R.M. Nandasiri	M.Ed., Addl. DG (Development)
G.A.W. Wijesekara	Ph.D., Addl. DG (Research)
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M.S. Nijamudeen	Ph.D., ADA (R), Soil & Water Management
K.A. Renuka	M.Sc., ADA (R), Soil Science
M.A.P.W.K. Malaviarachchi	M.Sc., ADA (R), Agronomy
R.A.C.J. Perera	M.Sc., ADA (R), Soil Science
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W.M.R. Kumari	M.Sc., ADA (R), Plant Breeding
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H.M.S.N. Herath	M.Sc., ADA (R), Plant Breeding
N.H.M.S. Chitrapala	M.Sc., ADA (R), Plant Breeding
W.M.K. Fernando	M.Sc., ADA (R), Plant Pathology
K.H.S.T. Deshabandu	M.Sc., ADA (R), Agronomy & Plant physiology
W.A.R. Dhammika	M.Sc., ADA (R), Biotechnology
B.M.K. Senarathna Menike	M.Sc., ADA (R), Plant Breeding
M.J.M.P. Kumararatne	M.Sc., ADA (R), Plant Breeding
B.I. Hettiarachchi	M.Sc., ADA (R), Plant Breeding
L.C. Silva	M.Sc. ADA (R), Agronomy
W.A.S. Vijitha Kumara	Dip. In Agric., ADA (D), Agriculture Development

A.T. Sooriyaarachchi	M.Sc., ADA (E), Socio Economic Research

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W.A.K. Karunathilake	M.Sc., Addl. D., Water Management
A. W. Gamini	M.Sc., DD (R), Tissue Culture
D. Weerasekara	M.Sc., ADA (R), Plant Breeding
D. P. P. Liyanage	M.Sc., ADA (R), Agronomy, Weed Science
D.G.C. Jeewani	M.Sc., ADA (R), Plant Breeding
M. T. Gunasena	M.Sc., ADA (R), Pathology
U.I.P. Perera	M.Phil., ADA (R), Plant Breeding
S.T. Munasinghe	B.Sc., ADA (R), Soil Science
Y.P.J. Amarasinghe	B.Sc., ADA (R), Plant Breeding
W.M.N.D. Gunathilake	M.Sc., ADA (R), Agronomy
R.A.A. Ranatunga	B.Sc., ADA (R), Food Science
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E.K.E.C. Nayana	B.Sc., ADA (R), Plant Breeding
I.R. Liyanage	B.Sc., ADA (R),, Soil Science
N.P. Liyanage	M.A., ADA (E), Rural Development, Production Economics & Agric. Marketing

AGRICULTURAL RESEARCH STATION, WEERAWILA

Mr S.D.S. Yapa	B.Sc., ADA (R), Agronomy

REGIONAL AGRICULTURAL RESEARCH & DEVELOPMENT CENTRE, ARALAGANWILA

M.S. Nijamudeen	Ph.D., DD(R), Water Mgt.
M.S.W. Fernando	M.Sc., , ADA(R), Plant Pathology
K.G.D.S. Bandara	B.Sc., ADA(R), Horticulture
H.M.C. Hitinayake	M.Sc., ADA(R), Genetics & Plant Breeding
D.G.P.S. Delpitiya	M.Sc, ADA(R), Water Mgt.

REGIONAL AGRICULTURAL RESEARCH & DEVELOPMENT CENTRE, KILINOCHCHI

S.J. Arasakesary	Ph.D., Addl. D.,Plant Breeding
S. Rajeshkanna	M.Sc., ADA (R), Environmental Science
P.G.H.M.S.N. Herath	B.Sc., ADA (R), Pathology
B.G.R.C. Balasooriya	B.Sc., ADA (R), Agronomy

AGRICULTURAL RESEARCH STATION, THIRUNELVELY

T. Karunainathan	Ph.D., ADA (R)IC, Water Management
K. Sathiyakumar	M.Sc., ADA (R), Natural Resource Management
B. Bawaleeswaran	B.Sc., ADA (R), Entomology

HORTICULTURAL CROP RESEARCH & DEVELOPMENT INSTITUTE, GANNORUWA

Priyantha Weerasinghe	Ph.D., Actg. Director, Soil Science
R.A.G.S. Rajapakse	Ph.D., Actg. Addl. Director (Research), Virology
P. Malathy	M.Sc., DD (R), Ag. Biology
H.M.P.S. Kumari	M.Phil., ADA (R), Biotechnology
H.M.V.T. Welgama	M.Sc., ADA (R), Ag. Biology
K.A.D.F.D. Kahandawarachchi	B.Sc., ADA(R, Crop Science
D.P. Karunananda	M.Sc., ADA (R), Breeding & Agronomy
R.G.S. Iroshani	M.Sc., ADA (R), Crop Science
Y.G.S. Seneviratne	B.Sc., ADA (R), Agronomy
N.L.A.T.S. Nanayakkara	M.Sc., ADA (R), Breeding & Agronomy
N.R.N. Silva	M.Sc., ADA (R), Soil Science
K.K.K. Navaratne	M.Sc., ADA (R), Soil Science
U. Wijewardena	M.Sc., ADA (R), Soil Science
J. Marasinghe	M.Sc., ADA (R), Entomology
K.M.D.W.P. Nishantha	M.Sc., ADA (R), Entomology/ Nematology
P.H. Ranaweera	M.Sc., ADA (R), Entomology
W.P.P.G. Weeraratne	M.Sc., ADA (R), Plant Pathology
W.A.R.T. Wickamarachchi	Ph.D., ADA (R), Plant Pathology
K.A.S. Thilakarathne	B.Sc., ADA (D), Agric. Extension

FOOD RESEARCH UNIT, GANNORUWA

S.M.A.C.U. Senarathne	M.Sc., Actg. DD(R), Post Harvest Technology, Food Technology
D.N. Hettiarachchi	M.Sc., ADA(R), Post Harvest Technology, Food Technology

REGIONAL AGRICULTURAL RESEARCH & DEVELOPMENT CENTRE, BANDARAWELA

K.P. Somachandra	M.Sc., DD(R), Plant Pathology

P.D. Abeythilakaratne	M.Sc., ADA(R), Horticulture
K.M.S. Kodikara	M.Sc., ADA(R), Soil Science
J.M.D.D.E. Jayamanna	B.Sc., ADA(R), Agronomy
G.G.S.U. Gamage	M.Sc., ADA(R), Plant Breeding
G.D.G. Chathurani	M.Sc./ M.Phil., ADA(R), Floriculture/ Tissue Culture
R.M.N. Dissanayake	B.Sc., ADA(R), Plant Breeding
E.A.E.S.S. Jayasekera	M.Sc., ADA(R), Plant Pathology
T.K.A.I. Hadji	M.Sc., ADA(R), Entomology
N.B.U. Dissanayake	B.Sc., ADA(R), Horticulture
I.C.S. Edirimanna	B.Sc., ADA(R), Agronomy

AGRICULTURAL RESEARCH STATION, RAHANGALA

Y.L.B. Pavithrani	B.Sc., ADA(R), Agronomy

REGIONAL AGRICULTURAL RESEARCH & DEVELOPMENT CENTRE, MAKANDURA

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B.A.N.K. Balasooriya	M.Sc., ADA (R), Plant Breeding & Agronomy
S.A.S.M. Kumari	M.Sc., ADA (R), Plant Breeding & Agronomy
D.M.P.S. Dissanayake	M.Sc., ADA (R), Soil & Plant Nutrition
W.M.S.K. Weerasinghe	M.Sc., ADA (R), Floriculture &Tissue Culture
P. Rajapaksha	B.Sc., ADA (R), Pathology & Mushroom

AGRICULTURAL RESEARCH STATION, KALPITIYA

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AGRICULTURAL RESEARCH & DEVELOPMENT CENTRE, SITA ELIYA

A.G.C. Babu	M.Sc., DD (R), Plant Pathology
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M.A.P. Mayakaduwa	M.Sc., ADA (R), Soil Science
H.A.S.N. Hettiarachchi	B.Sc., ADA (R), Entomology
K. Pushpanji	M.Sc., ADA (R), Pathology

AGRICULTURAL RESEARCH STATION, TELIJJAWILA

J.C. Rajapakse	M.Sc., ADA (R) IC, Plant Pathology
D.A. Shirani	M.Sc., ADA (R), Biotechnology
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W.A. Anura	B.Sc., ADA (R), Soil Science

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M.B. Weerasuriya	M.Sc., ADA (D), Environmental Science

AGRICULTURAL RESEARCH STATION, GIRANDURUKOTTE

H.R.P. Fernando	M.Sc., DD(R), Postharvest Technology
P.G.Sunil Shantha	M.Sc., ADA (Research), Agriculture
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FRUIT RESEARCH & DEVELOPMENT INSTITUTE, HORANA

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A.J. Warushawitharana	M.Sc., ADA (R), Horticulture
W.D. Lesly	M.Sc., ADA (R), Plant Breeding
I. Kalubowila	M.Sc., ADA (R), Plant Breeding
M.R.D.L. Kulatunga	M.Phil., ADA (R), Soil Science
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D.S.T. Baddegama	M. Sc., ADA (R), Food Science
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M. Kuruppu	B.Sc., ADA (R), Plant Pathology
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P.A.N. Chandrasiri	B.Sc., ADA (D), Extension
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FRUIT CROP RESEARCH & DEVELOPMENT STATION, GANNORUWA

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PLANT VIRUS INDEXING CENTRE, HOMAGAMA

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S.M. Nagahawatta	M.Sc., ADA(R), Biotechnology
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L.G.I. Samanmalee	M.Sc., ADA(R), Plant Cell &Tissue Culture

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RICE RESEARCH & DEVELOPMENT INSTITUTE, BATALAGODA

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R.S.K. Keerthisena	Ph.D., Addl. D, Agronomy
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M.M.A.S.K. Abeysekera	M.Sc., ADA (R), Weed Science
W.M.U.K. Rathnayake	M.Phil., ADA (R), Water Management
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S.P.G.S. Pathirana	M.Sc., ADA (R), Soil Science
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S.M.A. Priyadarshani	M.Phil., ADA (D), Extension & Training
A.V.C. Abhayagunasekara	M.Sc., ADA (R), Plant Breeding
R.M.U.S. Bandara	B.Sc., ADA (R), Weed Science
K.R.D. Gunapala	M.Sc., ADA (R), Plant Pathology
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S.S. Paththinige	M.Sc., ADA (R), Plant Breeding
W.S. Priyantha	B.Sc., ADA (R), Plant Breeding
S.P. Rebeira	B.Sc., ADA (R), Food Science &Technology
S.R. Sarathchandra	M.Sc., ADA (R), Entomology
R.M.N.H. Senanayake	B.Sc., ADA (R), Plant Breeding
K.A.K. Wijesena	M.Sc., ADA (R), Plant Breeding
R.J. Ratnayake	B.Sc., ADA (D), Extension & Training
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L.A.D.S. Wijesinghe	M.Sc., ADA (D), Extension & Training

RICE RESEARCH STATION, AMBALANTOTA

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M.H.U. Siriwardena	M.Sc., ADA (R), Plant Breeding

AGRICULTURAL RESEARCH STATION, LABUDUWA

J. Ponnamperumaarachi	M.Sc., ADA (R) IC, Plant Protection

U.A.J. Ratnayake	M.Sc., ADA (R), Soil Science & Agronomy
M.C. Millawithanachchi	M.Sc., ADA (R), Plant Breeding

AGRICULTURAL RESEARCH STATION, SAMMANTHURAI

Y.B. Iqbal	M.Phil., ADA (R) IC, Agronomy
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RICE RESEARCH STATION, PARANTHAN

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REGIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT CENTRE, BOMBUWELA

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N.P.S. de Silva	M.Sc., ADA (R), Plant Breeding
D.M. Withanawasam	M.Sc., ADA (R), Plant Breeding
W.R.K.D.W.K.V. Wickramasinghe	M.Sc., ADA (R), Agronomy
S.P. Gunaratne	M.Sc., ADA (R), Soil Science
W.D.P. Weerasinghe	B.Sc., ADA (R) Plant Breeding
H.N.S. Fernando	M.Sc., ADA (R), Pathology
I. Dissanayake	Dip. In Agric., ADA (R), Water Management

RICE RESEARCH STATION, BENTOTA

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T.G.I. Sandamali	B.Sc., ADA (R), Plant Protection

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M.A.K. Munasinghe	M.Sc., Addl.D., Land & Water Resources Management
K.M.A. Kendaragama	M.Phil., DD(R), Soil Science
B.V.R. Punyawardena	Ph.D., Head, Division of Agro-Climatology and Environment Change, Agro- Meteorology
N.D.G. Hettiarachchi	M.Sc., Head, Division of Knowledge Management, Natural Resource Management
H.K. Kadupitiya	Ph.D., Head, Division of Land use Planning and Geo-Information, GIS & Remote Sensing
A.G. Chandrapala	Ph.D., Head, Division of Soil and Water Resources Management, Agronomy

C.K. Wickramathunga	B.Sc., ADA (R), Agriculture
S.S. Senanayke	M.Sc., ADA (R), Bio system Engineering
A.B. Abeysekara	M.Sc., ADA (R), Food Science
M.P.D. Nadeera	M.Sc., ADA (D), Crop Science
P.G.K. Jayathissa	Dip. In Agric., ADA (D), Agriculture

SEED CERTIFICATION & PLANT PROTECTION CENTRE, GANNORUWA

K. Hettiarachchi	Ph.D., Director, Genetics & Plant Breeding, Seed Technology, Molecular Biology & Biotechnology
W.M.D. Wasala	M.Phil., Addl. D., Plant Genetic Resource Management, Agronomy
S.S.K. Hemachandra	M.Sc., ADA (D), Plant Protection

SEED CERTIFICATION SERVICE, HEAD OFFICE, GANNORUWA

M.G.D.L. Priyantha	Ph.D., DD, Plant Pathology
S.A.M.R. Abeykoon	M.Sc., ADA (D),Crop Science
K.K.S.D. Pradeepika	B. Sc., ADA (R), Crop Science
I.K. Wasala	B.Sc., ADA (R), Agriculture
M. Sanjeewani	B. Sc., ADA (D), Agriculture
R.A.I.S. Ariyaratne	B. Sc., ADA (D), Agriculture
R.N. Premakumara	B. Sc., ADA (D), Agriculture
A.R.M.S. Ranasingha	Dip. In Agric., ADA(D), Agriculture
L.D.W.K. Kodithuwakku	Dip. in Agric., ADA (D), Agriculture
H.M.M.D. Herath	Dip. In Agric., ADA (D), Agriculture

SEED HEALTH TESTING UNIT

M.D.G.L. Priyantha	Ph.D., DDIC, Plant Pathology

SEED TESTING LABORATORY, PERADENIYA

Y. M. H. Liyanage	M. Sc., ADA (D) IC, Seed Testing

SEED TESTING LABORATORY, ALUTHTHARAMA

J.W.K. Samaranayake	M.Phil., ADA (D), Soil Biology

SEED TESTING LABORATORY, BATA ATHA

N.D. Vitharana	B.Sc., ADA (D) IC, Agriculture

SEED TESTING LABORATORY, MAHAILLUPPALLAMA

T.D.M. Ramyalatha	M.Sc.., ADA (D) IC, Water Management

SCS REGIONAL OFFICE, PARANTHAN

S. Selvakumar	B.Sc., ADA (D) IC, Agriculture

PLANT PROTECTION SERVICE, GANNORUWA

S.S. Weligamage	M.Sc., DD, Vegetable IPM
N.P.H. Nimalananda	M.Sc., ADA (D), Plant Protection
T.N. Ihalagamage	B.Sc., ADA (D), Plant Protection
M.S.K.K. Perera	B.Sc., ADA (R), Management of Termites and Storage Pests

OFFICE OF THE REGISTRAR OF PESTICIDES, PERADENIYA

J.A. Sumith	Ph.D., Actg. Registrar of Pesticides, Environmental Engineering, Environmental Toxicology
S.N.L. Ratnaweera	M.Sc., ADA(R), Agricultural Science
C. Magamage	M.Sc., ADA(R), Chemistry
P.W.Y. Lakshani	B.Sc., ADA(R), Chemistry
W.L.C. Wijayasundara	B.Sc., ADA(D), Agricultural Science
H.A.R.P. Vilasini	M.Sc., ADA(D), Agricultural Science
U.S.K. Abeysinghe	M.Sc., ADA(R), Agricultural Science

PLANT GENETIC RESOURCES CENTRE, GANNORUWA

W.L.G. Samarasinghe	Ph.D., DD (R), Biotechnology
S.C.J. Dissanayake	M.Phil., ADA (R), Applied Statistics
A.S.U. Liyanage	Pg. Dip.., ADA (R), Germplasm Exploration
S.K. Wasala	Ph.D., ADA (R), Genetics
S.P. Bandara	M.Sc., ADA (R), Agricultural Biology
S.M.S.W. Wanigadewa	B.Sc., ADA (R), Agriculture
E.S.C. Edirisinghe	M.Sc., ADA (R), Agriculture

NATIONAL PLANT QUARANTINE SERVICE, KATUNAYAKE

D.M.J.B. Senanayake	Ph.D., Addl. D., Pathology
I.K. Warshamana	M.Sc., ADA (R), Horticulture
W.J. Nimanthika	B.Sc., ADA (R), Plant Science
R.A.P. Ranaweera	B.Sc., ADA (R), Entomology
M.A. Sandhya Kumari	M.Sc., ADA (D), Horticulture
G.G.D. Lalani	M.Sc., ADA (D), Communication & Extension
S.D.K. Priyadarshani	M.Sc., ADA (D), Agricultural Systems
N.H.M.S. Chithrapala	M.Sc., ADA (R), Crop Science
A.P. Siriwardhana	M.Sc., ADA (D), Crop Science

PLANT QUARANTINE STATION (SEA PORT)

L.C. Hewage	M.Sc., ADA (R)IC, Plant Protection
K.C.Wasalathanthri	B.Sc., ADA (D), Crop Science
S.H.N. Jayawickrama	B.Sc., ADA (D), Crop Science

K.G.M. Shaminda	B.Sc., ADA (D), Agric. Engineering
C. Fernando	Dip. In Agric., ADA (D), Agriculture

PLANT QUARANTINE STATION (AIR PORT, KATUNAYAKE)

N.S.Assalaarachchi	B.Sc., ADA (D), Crop Science
M.P.M. Senaratna	M.Sc., ADA (D), Food & Nutrition
N.J.M. Nathavitharana	B.Sc., ADA (D), Entomology

PLANT QUARANTINE STATION (AIR PORT, MATTALA)

A.W. Gamini	M.Sc., ADA (R)IC, Tissue Culture
J.P.L. Hettige	B.Sc., ADA (D), Food Science

PLANT QUARANTINE STATION (GANNORUWA)

M. D. T. Perera	Ph.D., ADA (R)IC, Entomology

SEED & PLANTING MATERIAL DEVELOPMENT CENTRE, PERADENIYA

H.P. Thilakeratne	B.Sc., Director, Horticulture
K.D. Pushpananda	B.Sc., Addl. Director (Seed Potato)
H.M.S.P. Herath	M.Sc., Addl. Director (Paddy & OFC)
W.M. Dayawathie	M.Sc., DD (Horticulture)
D.M. Tamara Kumari	Dip. in Agric., DD, (Seed Paddy)
W.M.I. Weerasekara	M.Sc., DD (Progress Monitoring & Farm Development), Farm Management
H.M.J.K. Herath	M.Sc., DD (Vegetable Seeds)
H.M.U.A.G. Jayalath Bandara	M.Sc., DD (Development)
A.H.W.M.U.I.K. Herath	Dip. in Agric., ADA (Development), Farm Management
M.S. Thilakasiri	Dip. In Agric., ADA (OFC)
M.A. Jayathilaka Bandara	Dip. In Agric., ADA (Potato)

SPMDC REGIONAL UNITS

A. Mathagasinghe	M.Sc., DDA – Seed (Colombo)
T.M.A.K.B. Tennakoon	B.Sc., DDA- Seed (Kundasale)
R.A.P.S. Wimalasena	M.Sc., DDA-Seed (MahaIlluppallama)
A.W.A. Samarasinghe	M.Sc., DDA- Seed (Aluttarama)
M.C. Jayasinghe	M.Sc., DDA-Seed (Nuwara Eliya)
S. Satheeswaran	M.Sc., DDA-Seed (Kilinochchi)
C.P. Sathyamoorthi	Dip. in Agric., DDA-Seed (Vavuniya)
Thusitha Nandana	M.Sc., DDA-Seed (Telijjawila)
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N.B. Mohotti	B.Sc., DDA - Seed (Bata-Atha)
M.G.K. Edirisooriya	M.Sc., DDA-Seed (Pelwehera)
W.K.P. Weerasooriya	Dip in Agric., DDA - Seed (Polonnaruwa)

A.P. Dikkumbura	B.Sc.., DDA-Seed (Kantale)
H.D.K.D. Jayawardhana	Dip. in Agric., DDA-Seed (Nikaweratiya)
D.N.M.C.K. Navaratne	M.Sc., ADA (D) (Kundasale)
R. Sivaneshan	M.Sc., DDA (D), Karadiyanaru
D.M.S.S. Dissanayake	B.Sc., ADA (D) (Nuwara Eliya)
L.H.R.M. Gunasinghe	B.Sc., ADA (D), (Colombo)
P.P.M.C. Vaidyaratna	B.Sc., ADA (D) (Bata Atha)
J.M.R. Jayasundara	Dip. In Agric., ADA (D), (Nikaweratiya)
M.U. Hathurusinghe	M.Sc., ADA (D), (Pelwehera)

SOCIO ECONOMIC & PLANNING CENTRE, PERADENIYA

T.H.C.S. Perera	M.Sc., Director, Agrarian Development & Technology Transfer, International Trade Negotiations
H.U. Warnakulasooriya	M.Phil., Addl. Director, Production Economics, Policy Analysis, Productivity Analysis
R.M. Herath	Ph.D., DD, Productivity Efficiency, Comparative Advantage, Policy Analysis
M.I.M. Rafeek	Ph.D., AD, Productivity Efficiency, Comparative Advantage, Policy Analysis
V.D.N. Ayoni	M.Sc., AD, Production Economics, Marketing, Environmental Economics
W.A.C.K. Chandrasiri	M.Sc., AD, Production Economics, Trade and Agriculture Policy
J.K. Galabada	M.Sc., AD, Agric. Policy analysis & Trade
K.G.C.D.B. Wijesinghe	M.Sc., AD, Production & Development Economics, Planning , Monitoring & Evaluation
P.S.R Premarathne	B.Sc., AD, Agricultural Marketing
S. Mathangaweera	B.A., AD, Production Economics & Marketing

EXTENSION & TRAINING CENTRE, PERADENIYA

HEAD QUARTERS, PERADENIYA

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K.N.S. Ranatunga	M.Sc., Addl.D. (Education & Examination), Ag. Extension
A.M.U. Pinnalanda	M.Sc., DD (Examination), Ag. Extension
K.B. Gunaratne	M.Sc., DD (Training), Agric. Extension
B.A.H. Bamunuarachchi	M.Sc., DD (Education), Soil Science
J.R. Sudasinghe	M.Sc., DD (Extension), Natural Resource Management
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Ajitha Manikkrama	M.Sc., ADA (Curriculum), Management of Natural Resource & Sustainable Agriculture
R.P. Kasturiarachchi	M.Sc., ADA (Women Agriculture Extension), Plant Protection
H.R.U.T. Erabadupitiya	M.Sc., ADA, Climate change adaptation, Protected agriculture, Micro irrigation
K.G.M. Karunaratne	B.Sc., ADA, Micro irrigation
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A.S.M. Roshan	B.Sc., ADA, Agriculture

INTER PROVINCIAL EXTENSION, ANURADHAPURA

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G.S.K. Samaraweera	M.Sc., ADA, Soil Science
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W.S. Kumara	B.Sc., ADA, Agric. Economics
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INTER PROVINCIAL EXTENSION, KANDY

G.N. Arunathilake	M.Sc., DD, Agric. Extension
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INTER PROVINCIAL EXTENSION, MONARAGALA

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INTER PROVINCIAL EXTENSION, POLONNARUWA

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V.M. Jayalath	B.Sc., ADA, Agric. Extension
J.S.M.S.S. Menike	B.Sc., ADA, Food Science & Technology
B.M.G.S. Basnayake	Dip. In Agric., ADA, Agric. Extension

AGRICULTURAL ENTERPRISE DEVELOPMENT & INFORMATION SERVICE, PERADENIYA

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P.K.P. Muthukumarana	B.Sc., ADA, Other Field Crops
H.P. Silva	B.Sc., ADA, Fruits
M.A.I. Dayananda	B.Sc., ADA, Vegetables

INSERVICE TRAINING INSTITUTE, GANNORUWA

I.M.N. Chandrasiri	M.Sc., DD, Protected Agriculture
A.H.C. Bandara	M.Sc., ADA, Bee Keeping, Plant Protection, Agric. Extension
A.G. Karunaratne	M.Sc., ADA, Micro irrigation & Vegetable cultivation
H.M. Gammanpila	M.Sc., ADA, Food Technology & Postharvest Technology
C.K.D. Wellala	M.Phil., ADA, Fruit cultivation & Root crop cultivation
E.G.P.D. Jayasinghe	B.Sc., ADA, Mushroom cultivation, Home Gardening & Organic Cultivation

FARM MECHANIZATION TRAINING CENTRE, ANURADHAPURA

N.A.R.J. Perera	B.Sc., DD, Agric. Engineering
H.S. Seneviratne	B.Sc., ADA, Horticulture
M.N.C. Wideha	B.Sc., ADA, Biochemistry
S.S.J. Seneviratne	M.Sc., ADA, Food Science & Technology

DISTRICT AGRICULTURAL TRAINING CENTRE, WEERAWILA

N.C.R. Dias	B.Sc., ADA, Plant Protection

SCHOOL OF AGRICULTURE, ANGUNAKOLAPELESSA

G.C.A. Gunawardhana	M.Sc., Postgrad. Dip. in Education, DD/ Principal, Water Resource & Environmental Management
I.R.N. Abeydheera	B.Sc., ADA, Extension & Economics
W.L.O. Manel	M .Sc., ADA, Horticulture
J.C.W. Jayasuriya	B.Sc., ADA, Food Science
M.W.R. Wasana	B.Sc., ADA, Soil Science
D.M.U.S. Bandara	B.Sc., ADA, Crop Science
G.C.S. Kumara	B.Sc., ADA, Crop Science
N.T. Wijesinghe	B.Sc., ADA, Economics & Extension
N.W.V.U.S.S. Saumya Kumari	B.Sc., ADA, Economics & Extension
R.D.L. Nilangani	B.Sc., ADA, Crop Science

SCHOOL OF AGRICULTURE, ANURADHAPURA

K.V. Chandani	Sc., ADA/ Principal, Soil Science

HORTICULTURE DEVELOPMENT & TRAINING INSTITUTE, BIBILE

H.K. Pradeep Kumara	B.Sc., DD, Economics & Extension
K.A.S. Lakmal	B.Sc., ADA, Animal Science
E.W.M.G.W.L.B. Kurukohogama	Dip. in Agric., ADA, Agriculture

SCHOOL OF AGRICULTURE, KARAPINCHA

R.M. Gunawardena	Postgrad. Dip.in Education, DD / Principal, Education & Evaluation
I.A.D.C.T. Kumari	M.Sc., ADA, Plant Protection Technology
A.S.Y.P. Ranasinghe	M.Sc., ADA, Horticulture
S.L. Bogahawatta	B.Sc., ADA, Agric. Extension
G.A.S.A. Tennakoon	B.Sc., ADA, Horticulture
D.S.A. Kahawattage	B.Sc., ADA, Crop Science
H.P.W. Nilanthi	B.Sc., ADA, Agric. Economics
P.I.P.M. Pussella	B.Sc. ADA, Crop Production

SCHOOL OF AGRICULTURE, LABUDUWA

G.G.V. Shyamalee	M.Sc., ADA, Pomology
M.P. Thamara	M.Sc., ADA, Floriculture & Landscaping
E. Ratnasiri	B.Sc., ADA, Agriculture
M.N.D. Seelanthi	B.Sc., ADA, Agriculture
K.K.D. Kandagoda	B.Sc., ADA, Agriculture
K.G. Ranjani	B.Sc., ADA, Agriculture

SCHOOL OF AGRICULTURE, PELWEHERA

B.M.A.P. Basnayake	M.Sc., DD, Horticulture

D.R. Kanchana	M.Sc., ADA, Economics & Animal Production
H.M.N.K. Herath	M.Sc., ADA, Plant Protection
D.M.P.T. Dissanayake	M.Sc., ADA, Farm Machinery
S.D. Mangalee	B.Sc., ADA, Horticulture, Minor Export Crops
P.M.D. Munasinghe	M.Sc., ADA, Horticulture, Crop Production, Agro climatology & Soil Science
R.J. Ratnayake	B.Sc., ADA, Food Science
A.M.S.K. Adikari	M.Sc., ADA, Other Field Crops
W.G. Priyadarshani	B.Sc., ADA, Agribusiness

SCHOOL OF AGRICULTRUE, VAVUNIYA

K. Chandrakanthan	B.Sc., Principal/ DD, Crop Production & Agric. Engineering
S. Senthilkumaran	M.Sc., ADA, Food Science & Technology
M.S. Rinoos	B.Sc., ADA, Plant Protection & Horticulture
S. Sanjeepan	B.Sc., ADA, Animal Production, Agri. Extension, Economics & Horticulture

SCHOOL OF AGRICULTURE, WARIYAPOLA

B.M. Thilakaratne	M.Sc., ADA/ Principal, Agric. Engineering
S.M.A. Priyadarshinie	M.Phil., ADA, Soil Science
P.W.R.C. Paragahagoda	M.Sc., ADA, Agric. Engineering
R.P.R. Malkanthi	B.Sc., ADA, Plant Protection
W.G. Priyadarshanie	B.Sc., ADA, Agribusiness Management

SCHOOL OF AGRICULTURE, KUNDASALE

H.S. Kuruwita	M.Sc., DD/ Principal, Crop Science
M.K. Rubasinghe	M.Sc., ADA, Floriculture & Landscaping
W.T.G. Ranjani	M.Sc., ADA, Plant Protection
A.L. Siriwardana	M.Sc., ADA, Plant Protection
A.S.M. Harees	B.Sc., ADA, Food Science
B.A.P. Kumari	M.Sc., ADA, Agric. Economics
P.G. Yasamali	M.Sc., ADA, Crop Science
R.R. Senarath	M.Sc., ADA, Horticulture, Floriculture & Landscaping
T.M.P.G.S.P. Tennakoon	M.Phil., ADA, Horticulture, Floriculture & Landscaping
U.D.D. Damayanthi	M.Sc., ADA, Crop Science
S.B.A.M.A.M. Gunawardene	M.Sc., ADA, Food Science & Technology

C.M.N R. Chandrasekara	M.Sc., ADA, Floriculture & Landscaping
R.N.N. Perera	M.Sc., ADA, Plant Protection
Y.N.P. Wijeratne	B.Sc., ADA, Agric. Economics & Animal Science
P.C.P. Perera	B.Sc., ADA, Agri Business Technology
K.G.W. Gunawardena	M.Sc., ADA, Agric. Engineering
K.P.A.D. Pathirana	M.Sc., ADA, Soil Science & Environmental Science
G.R.C.N.K. Godigamuwa	B.Sc., ADA, Horticulture
H.A.N. Upekshani	M.Sc., ADA, Soil Science & Environmental Science
R.A.C. Wijesinghe	M.Sc., ADA, Crop Science

PROVINCIAL DIRECTOR OF AGRICULTURE, SABARAGAMUWA PROVINCE

K.P. Karavita	M.Sc., PD, Devt. Communication & Extension
J.M.D.J. Bandara	B.Sc., DPD, Microbiology & Plant Pathology
G.B.A.D. Rajapaksha	M.Sc., ADA (D), Crop Science
W.M.S.N. Wanasundara	M.Sc., ADA (D), Crop Science
R.P.N.L. Rajapaksha	M.Sc., ADA (D), Crop Science
A.J.N.L. Jayaratne	B.Sc., ADA (D), Animal Science
P.G.R.C.S. Welagedara	B.Sc., ADA (D), Animal Science
Y.K. Bamunuarachchi	B.Sc., ADA (D), Crop Production
S.N.K. Saranasinghe	B.Sc., ADA (D), Insect Pest Mgt.
J.P. Gunawardhana	B.Sc., ADA (D), Soil Science
S.M.C.P. Siriwardena	B.Sc., ADA (D), Crop Science
W.A.H.B. Wirasegoda	M.Sc., ADA (D), Agriculture

PROVINCIAL DIRECTOR OF AGRICULTURE, NORTH WESTERN PROVINCE

O.P. Kithsiri	M.Sc., PD, Agric. Extension
S.B.S.K. Semasinghe	M.Sc., Addl. PD, Ag. Extension
H.M. S. Herath	B.Sc., DPD, Agric. Extension
B.L. Gunathilake	M.Sc., DPD, Ag. Extension
N.H. Wimalaratne	M.Sc., DPD, Agric. Extension
D.M.M. Dissanayake	M.Sc., DPD, Agric. Extension
W.A. Seelaratne	Dip. in Agric., DPD, Agric. Extension
K.M.A. Sukoor	Dip. in Agric., ADA (D), Agric. Extension
W.M.S. Wanninayake	M.Sc., ADA (D), Ag. Extension
Sisira Kumara	M.Sc., ADA (D), Water Mgt.
A.H.M.B. Wadigamangawa	Dip. in Agric., ADA (D), Ag. Extension
H.L.M. Jinadarie Lanka	B.Sc., ADA (D), Agric. Extension
I.A.R. Damayanthi	B.Sc., ADA (D), Crop Science

B.V.T. Shyamalee	M.Sc., ADA (D), Agric. Extension
H.L.K. Liyanage	B.Sc., ADA (D), Agric. Extension
H.M.B.I.C. Fernando	Dip. in Agric., ADA (D), Agric. Extension
E.S.D. Samaraweera	M.Sc., ADA (D), Agric. Extension
R.M.R.A.S. Ratnayake	B.Sc., ADA (D), Crop Science

PROVINCIAL DIRECTOR OF AGRICULTURE, WESTERN PROVINCE

I.U. Mendis	M.Sc., PD, Agric. Extension
A.R.W.M.M.U Amarakoon	M.Sc., Addl. PD, Food Science & Technology
W.M.C. Weerakoon	B.Sc., DPD, Agric. Extension
B.J.S.S. Fernando	M.Sc., DPD, Agric. Extension
G.G.P.P. de Silva	B.Sc., DPD, Agric. Extension
U.K.D.N.N. Ranatunga	M.Sc., ADA (D), Ag. Extension
S. N. Wickramathilake	B.Sc., ADA (D), Agric. Biology
P.P. Wickramasinghe	B.Sc., ADA (D), Ag. Extension
M.D.S.A. Chandrasekara	M.Sc., ADA (D), Agric. Extension
W.M.M. Vajira Kanthi	B.Sc., ADA (D), Agric. Extension
H.K.G. Swarnalatha	B.Sc., ADA (D), Agric. Extension
V.U.M. Amarabandu	Dip. In Agric., ADA (D), Agric. Extension
S. Malmalage	B.Sc., ADA (D), Agric. Engineering
D.D. Weerakoon	B.Sc., ADA (D), Agric. Training
J.P.S. Hemalatha	B.Sc., ADA (D), Agric. Engineering
H.A.R.S. Ranasinghe	B.Sc., ADA (D), Crop Science
G.P. Mahawithanage	B.Sc., ADA (D), Agric. Training
H.S. Premarathna	Dip. in Agric., ADA (D), Agric. Extension

PROVINCIAL DIRECTOR OF AGRICULTURE, NORTH CENTRAL PROVINCE

M.H.B.P.H. Madana	M.Sc., PD, Sustainable Agriculture in GIS & RS
H.L. Thenuwara	M.Sc., DPD, Food Science & Technology
B.P.S.W. Pathirana	B.Sc., DPD, Entomology
W.H.R.A. Dayaratne	M.Sc., ADA (D), Crop Science
H.M. Amarasena	Dip. in Agric., ADA (D), Agric. Extension
H.B.D.G.C. Ratnayake	M.Sc., ADA (D), Crop Science
A.M. Dharmasena	Dip. In Agric., ADA (D), Agric. Extension
G.K.A.D. Welgama	B.Sc., ADA (D), Agric. Extension
D.P.D. Gunasinghe	Dip. in Agric., ADA (D), Agric. Extension

PROVINCIAL DIRECTOR OF AGRICULTURE, UVA PROVINCE

R.S.C.W.M.A.B.M. Wijetunga	M.Sc., Actg. PD, Agric. Extension
H.K.P. Jayalath	B.Sc., Actg. DPD, Agric. Extension
G.A.A. Gurusinghe	B.Sc., Actg. DPD, Agric. Training
S.D.D. Rajapaksha	B.Sc., ADA (D), Agric. Extension
L.H.P. Nilmini	B.Sc., ADA (D), Agric. Extension
H.M.H. Udayangani	B.Sc. ADA (D), Agric. Extension
S.M.S. Udayangani	B.Sc. ADA (D), Agric. Extension
R.D.M.K.K. Wimalachandra	M.Sc., ADA (D), Agric. Training
H.M.H. Udayangani	B.Sc., ADA (D), Agric. Extension
L.A.T. Munasinghe	B.Sc., ADA (D), Agric. Training
R.P.W. Prasangi	B.Sc., ADA (D), Agric. Extension
R.M.N.S. Kumara	B.Sc., ADA (D), Agric. Extension
S.C. Sellahewa	B.Sc., ADA (D), Agric. Extension

PROVINCIAL DIRECTOR OF AGRICULTURE, NORTHERN PROVINCE

S. Sivakumar	M.Sc., PD, Agric. Extension
A. Selvaraja	M.Sc., DPD, Agric. Extension
A. Anchanadevi	B.Sc., DPD, Agric. Extension
P. Atputhachandran	B.Sc., DPD, Agric. Extension
T. Yogeswaran	B.Sc., DPD, Agric. Extension

PROVINCIAL DIRECTOR OF AGRICULTURE, EASTERN PROVINCE

S.M. Hussain	M.Sc., PD, Agric. Extension
M. Kugathasan	M.Sc., DPD, Ag. Extension
K. Hariharan	M.Sc., DPD, Gender

PROVINCIAL DIRECTOR OF AGRICULTURE, CENTRAL PROVINCE

W.S.C. Perera	M.Phil., DPD, Extension/Agronomy
S.M.K. Dissanayake	B.Sc., DPD, Crop Science
P.K. Seneviratne	B.Sc., DPD, Horticulture
P.R.P.Y. Pallemulla	Postgrad. Dip., DPD, Soil Science
M.G.N. Sandamali	M.Sc., ADA (D), Crop Science
R.S. Chandrasiri	M.Sc., ADA (D), Crop Science
H.M.G.M.K. Weerasooriya	M.Sc., ADA (D), Crop Science
M.P.K. Dodanwala	M.Sc., ADA (D), Organizational Mgt.
W.J. Samarawickrama	M.Sc., ADA (D), Crop Science
E.M.H.B. Ekanayake	B.Sc., ADA (D), Agric. Extension
I.H.K.D. Kanthimala	Dip. In Agric., ADA (D), Agric. Extension
M.S. Thilakasiri	Dip. in Agric., ADA(D), Agric. Extension
K.A.N. Wijesinghe	B.Sc., ADA (D), Crop Science

B.H.T.K. Kumari	B.Sc., ADA (D), Food Science & Technology
W.M.K.D. Wijeratnayake	B.Sc., ADA (D), Landscape Architecture & Floriculture
G.G.D.S. Chandradasa	B.Sc., ADA, Horticulture

PROVINCIAL DIRECTOR OF AGRICULTURE, SOUTHERN PROVINCE

M.W.S.A. de Silva	Dip. in Agric., DPD, Agric. Extension
S.K.N. Rubasinghe	B.Sc., DPD, Agric. Extension
I.D. Gunawardhana	B.Sc., DPD, Agric. Extension
D.A. Palihawadana	M.Sc., ADA (D), Agric. Extension
D.N. Gunawardhana	M.Sc., ADA (D), Agric. Extension
H.K.D.K. de S. Siriwardhana	B.Sc., ADA (D), Agric. Extension
W.G.M. Wickramasinghe	B.Sc., ADA (D), Agric. Extension
K.S. Pushpakanthi	B.Sc., ADA (D), Agric. Extension
S.D.W. Gunasekera	B.Sc., ADA (D), Agric. Extension
N.M.A. Dharmapriya	B.Sc., ADA (D), Agric. Extension
S. Wanigasekara	Dip. in Agric., ADA (D), Agric. Extension
Mahesh Subasingha	Dip. in Agric., ADA (D), Agric. Extension

INFORMATION & COMMUNICATION CENTER

W.A.G. Sisira Kumara	M.A., Director, Communication
I.S.M. Haleemdeen	M.Sc., ADA (D), Agric. Economics
G.L.S.P. Liyanage	M.Sc., ADA (D), Agric. Extension

NATIONAL AGRICULTURE INFORMATION & COMMUNICATION CENTRE, GANNORUWA

R.D. Siripala	M.A., Addl. D., Media
I.G.K. Janaka	M.Sc., ADA (D), Agric. Extension
W.M.K.R. Wickramasinghe	M.Sc., ADA (D), Crop Science
H.G.H.J.K. Keerthiratne	M.Sc., ADA (D), Communication & Extension
T.A. Kamiss	B.Sc., ADA (D), Agriculture
M.F.M. Rizwan	B.Sc., ADA (D), Agric. Extension

PUBLICATION CENTER, GANNORUWA

S. Periyasamy	M.Sc., DD (Communication), Agric. Extension
J.K.A. Hettiarachchi	M.Sc., ADA (D), Natural Resource Management

FARM BROADCASTING SERVICE

W.L. Hiran Peiris	M.Sc., DD, Sustainable Agriculture
M.A. Chandanie	M.Sc., ADA (D), Horticulture
I.P. Liyanage	B.Sc., ADA, Agriculture
R.A.T.M. Ramanayake	B.Sc., ADA (D), Agriculture
G.A. Gunasekara	B.Sc., ADA (D), Agriculture
J.A. Joseph	Dip. in Agric., ADA (D), Agriculture

AGRO TECHNOLOGY PARK, BATA ATHA

K.R.W. Keerthi	B.Sc., ADA (D), Agriculture

ADMINISTRATION DIVISION

Janaka Dharmakeerthi	B.B.A., Director (Administration), Public Management
R.A.D.T.N. Tennakoon	B.Sc., M.A., Director (Establishment)
P.V.M.S.B. Udovita	B.A., L.L.B., DD (Administration), Law
G.K.G.T.D. Gedarakumbura	M.Sc., AD (Administration), Organizational Management
W.S.P. Wickramaarachchi	M.A.,B.Sc., AD, (Establishment), Public Policy

ENGINEERING DIVISION

P. Rajapakse	C. Eng, B.Sc. (Eng.) Civil, Civil Engineer
M.A. Shantha Kumara	C. Eng., B.Sc.(Eng.) Mechanical, Mechanical Engineer
C.L. Rajapakse	C. Eng., B.Sc.(Eng.) Mechanical, Mechanical Engineer
B.M.W.L. Balasooriya	C. Eng., B.Sc. (Eng) Mechanical, Mechanical Engineer
A.K.S.P.S. Wijayasoma	B.Sc. (Eng.) Electrical, Electrical Engineer
A.P.A.P.S. Iayanthirathne	B.Sc. (Eng.) Civill, Civil Engineer
K.M.P. Sameera	B.Sc.(Eng.) Civil, Civil Engineer
L.L.R.R. Lokuliyanage	B.Sc. (Eng.) Mechanical, Mechanical Engineer
K.A.D. Peiris	B.Sc. (Eng.) Mechanicall, Mechanical Engineer
P.N.W.A.K. Gunarathne	B.Tech. (Eng.) Civil, Civil Engineer
D.M.B.R. Deegala	Civil Engineer, Limited stream

FARM MECHANIZATION RESEARCH CENTRE

B.M.C.P. Balasooriya	C. Eng., B.Sc. (Eng.) Mechanical,DD
H.M.A.P. Herath	B.Sc.(Eng.), Mechanical Engineer
G.A.M.A. Wijethunge	B.Sc. (Eng.), Mechanical Engineer
M.H.J.J. Hemachandra	B.Sc. (Eng.), Mechanical Engineer

FINANCE DIVISION

R.P. Premarathna	B.Com (Special), PGDAF, IPFDA, HNDC, Chief Accountant
C.K. Rajapathirane	M.A, PDA, B.Com, HNDA, DD (Finance)
M.F.M. Faiz	B.Com., PDAF, Chief Internal Auditor
W.A.G. Weerasingha	ICASL Inter., PGDA, DD (Finance)
M.A. Kumara	B.Sc. (Mgt.) Pub. Sp., DD (Finance)
K.S.D. Dissanayake	M.A. (Economics)., B.Sc. (Mgt.) Pub., DD (Finance)
C.P. Ruwanpitiya	B.Com.Sp., CBA, AD (Finance)
H.G.I. Madusanka	B.Com.Sp., IPFDA, AD (Finance)
H.M.U.S. Digashani	M.A., B.Com.Sp., AD (Finance)
K.D.L.M. Jayamini	M.A.(Economics), B.Com Sp., AD (Finance)
R.M.G.T.N. Amarasena	BBA Sp.,CMA stg level, ICASL stg I, AD (Finance)
S.N. Jayasingha	B.A., CBA, MAAT, AD (Finance)
A.M.M.K. Ratnayake	B.Sc. (Mgt.), CBA, AD (Finance)

PROGRESS MONITORING & EVALUATION UNIT, PERADENIYA

P.C. Peiris	M.Sc., DD, Agricultural Systems

* On study leave
** On no pay leave
*** On contract basis

8. TECHNICAL STAFF QUALIFICATIONS

(As at 2016.12.31)

Institute/ Centre/ Division/ Unit		Diploma	B.A./L.L.B./ BLIS	B.Com./BBA/ B.Ed./B.MS	B.Sc.	C. Eng/ M.I.E.	Postgrad. Dip.	M.A./ MBA	M.Sc./ M.Ed.	M.Phil.	Ph.D.	TOTAL
FCRDI	FCRDI	19			13		01		19	03	04	**59**
	GLORDC	15	05		13			02	08	01		**44**
	RARDC/ ARL	13			01				03		01	**18**
	RARDC/ KIL	04			04				01		01	**10**
HORDI	HORDI	20	01	02	31			01	15	04	03	**77**
	FRU	02	01		03				03			**09**
	RARDC/BAN	17	01		17				07	02		**44**
	RARDC/MK	23	06		08				06	01		**44**
	ARDC/SE	09			04							**13**
	ARS/TW	08	04		09				04			**25**
	ARS/GK	08			04				02			**14**
FRDI	FRDI	29	02	01	18				07	01	02	**60**
	FCRDS	09			01				02			**12**
	PVIC	12		01	07				05		01	**26**
RRDI	RRDI	61	09	01	29			01	19	04	04	**128**
	RARDC/BW	17	01		12				08	01		**39**
NRMC		18	03		05				08	01	04	**39**
SCPPC	SCPPC				01				02	01	01	**05**
	SCS	147	14	01	25				04	01	01	**193**
	PPS	07			02				06			**15**
	ROP	08			07				08		01	**24**
	PGRC	08	02		02		01		07		02	**22**
	NPQS	78	01		36				14			**129**
SPMDC		204	23		25			03	23			**278**
SEPC		04	15		02			06	12	01	02	**42**
ETC		514	14	01	78	01	01	01	25			**635**
ICC		54	07	01	31		02	04	08			**107**
Administration Div.		04	33	04	16			01				**58**
ENG	Engineering	09	07		07	04						**27**
	FMRC	09			04	01	01					**15**
Finance Div.			03	07	04			01				**15**
PMEU		03	04	04					03			**14**
TOTAL		**1333**	**156**	**23**	**419**	**06**	**06**	**20**	**229**	**21**	**27**	**2240**

ARL – Aralaganwila BAN - Bandarawela SE – Sita Eliya GK - Girandurukotte
KIL – Kilinochchi MK – Makandura TW – Telijjawila BW - Bombuwala

9. STAFF POSITION

(As at 2016.12.31)

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		ICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E
1	Director General of Agriculture	1	1																													**1**	**1**
2	Additional Director General of Agriculture (Research)	1	0																													**1**	**0**
3	Additional Director General of Agriculture (Development)	1	0																													**1**	**0**
4	Additional Director General (Administration)			1	1																											**1**	**1**
5	Director of Agriculture													1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	**10**	**1**
6	Director (Administration) I			1	1																											**1**	**1**
7	Director (Establishments) I			1	0																											**1**	**0**
8	Chief Accountant							1	1																							**1**	**1**
9	Chief Engineer					1	0																									**1**	**0**
10	Additional Director of Agriculture											1	0	1	0	3	0	2	0	1	0	1	1	1	0	5	0	4	0	5	0	4	0	**28**	**1**
11	Principal Agriculture Scientist																															**0**	**0**
12	Principal Agriculturist																															**0**	**0**
13	Registrar of Pesticides																									1	1					**1**	**1**
14	Accountant Class I							2	2																							**2**	**2**
15	Chief Internal Auditor									1	1																					**1**	**1**

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		ICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E
16	Engineer (Civil/ Electrical/ Mechanical) Class - I					1	1																											**1**	**1**
17	Engineer (Mechanical Research) Class - I					1	0																											**1**	**0**
18	Assistant/ Deputy Director (Establishment) (II/III)			2	2																													**2**	**2**
19	Assistant/ Deputy Director (Administration) (II/III)			1	1																													**1**	**1**
20	Deputy Director of Agriculture											2	1	2	1	7	3	8	0	4	0	6	0	6	1	22	0	20	3	20	2	9	0	**106**	**11**
21	Deputy Registrar of Pesticides																									1	0							**1**	**0**
22	Assistant Director of Agriculture (Agricultural Development)	0	1									2	1			4	1	0	3	5	3	6	4	5	3	53	30	33	31	201	122	32	18	**341**	**217**
23	Assistant Director of Agriculture (Agricultural Research)	6	0			2	0									109	47	87	55	38	22	59	34	25	9	55	25	1	0					**382**	**192**
24	Assistant Director of Agriculture (Agricultural Economics)											1	0	13	8	3	2	3	0	1	0	1	2							1	0			**23**	**12**
25	Accountant Class (II/III)							10	9																									**10**	**9**
26	Engineer (Civil)					4	4																											**4**	**4**
27	Engineer (Mechanical)					8	9																							1	0			**9**	**9**

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		ICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E
28	Engineer (Electrical)					1	1																											**1**	**1**
29	Legal Officer			1	0																													**1**	**0**
30	Assistant Director (Information & Communication Technology)																															1	0	**1**	**0**
31	Lecturer (Tamil Medium) - Contract																													19	13			**19**	**13**
32	Administrative Officer			8	7	1	1							1	1	6	2	4	3	1	1	3	1	1	1	4	1	2	2	5	3	1	1	**37**	**24**
33	Senior Librarian																															1	0	**1**	**0**
34	Agriculture Instructor (Special)															7	0	11	1	6	0	4	2	1	0	11	5	31	2	22	6	5	1	**98**	**17**
35	Research Assistant (Special)															7	1	7	5	3	0	3	1	1	1	3	5	1	0					**25**	**13**
36	Economic Assistant											1	0	10	7	3	1	3	2	1	1	1	0					1	0	1	0			**21**	**11**
37	Translator (English/Tamil/Sinhala)			2	2			1	0			3	4																	1	1			**7**	**7**
38	Information and Technology Officer																															19	12	**19**	**12**
39	Agriculture Monitoring Officer					1	1											1	1	1	1	2	2			11	11	3	3	13	13	1	1	**33**	**33**
40	Program Assistant (Agriculture)	4	0			2	0	0	2			6	1	11	1	16	2	31	20	21	8	2	11	4	2	20	15	15	5	38	16	7	2	**177**	**85**
41	Legal Assistant			2	1																													**2**	**1**
42	Media Assistant																															5	3	**5**	**3**
43	Audio Visual Assistant																															5	3	**5**	**3**
44	Budget Assistant							2	2																									**2**	**2**
45	Development Officer	2	2	27	29	7	7	26	32	3	3	5	7	8	6	15	12	24	11	12	3	24	21	6	5	50	29	80	49	60	62	20	21	**369**	**299**

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		ICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E
46	Librarian (I/II/III)															2	0	0	1											1	1	2	1	**5**	**3**
47	Soil Surveyor																							5	3									**5**	**3**
48	Agriculture Instructor					2	2					2	1	0	2	26	14	50	60	25	21	25	30	7	9	206	182	214	176	534	312	53	47	**1144**	**856**
49	Research Assistant															74	50	84	61	46	39	68	53	7	1	33	32	3	1	0	1			**315**	**238**
50	Engineering Assistant (Civil)					15	7									3	0	2	0	1	0	2	0			1	0	10	1	6	1			**40**	**9**
51	Engineering Assistant (Mechanical)																																	**0**	**0**
52	Engineering Assistant (Electrical)																																	**0**	**0**
53	Technical Officer					0	1																							3	1			**3**	**2**
54	Public Management Assistant	4	4	98	93	18	17	90	74	13	10	2	2	8	8	34	27	43	34	17	16	30	28	7	4	49	43	110	85	97	97	21	21	**641**	**563**
55	Technological Assistant (Extension)					7	4					2	2	3	3	21	18	28	26	10	17	25	22	1	1	72	62	83	83	254	231	25	27	**531**	**496**
56	Technological Assistant (Research)															9	4	1	3			3	3			0	1	2	2	0	1			**15**	**14**
57	Technological Assistant (Engineering-Civil)					9	21									2	1	3	0	1	1	2	1			0	1	11	2	6	4			**34**	**31**
58	Technological Assistant (Engineering-Mechanical)																																	**0**	**0**
59	Technological Assistant (Engineering-Electrical)																																	**0**	**0**
60	Information and Technology Assistant																															50	0	**50**	**0**

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		ICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E
61	Agriculture Extension Services Officer																			15	0													**15**	**0**
62	Photographer																															3	1	**3**	**1**
63	Bee Demonstrator															0	1															2	0			**2**	**1**
64	Farm Clerk															3	3	8	9	6	8	3	3			3	0	42	30	12	6	3	3	**80**	**62**
65	Male Warden																					0	1							11	9			**11**	**10**
66	Female Warden																													4	4			**4**	**4**
67	Audio Visual Technician																													1	0	0	1	**1**	**1**
68	Seed Technician																									24	10							**24**	**10**
69	Artist																															3	0	**3**	**0**
70	Driver	2	2	8	9	10	10	6	6			3	3	6	5	27	24	28	26	11	13	22	18	6	6	39	42	76	71	72	66	17	17	**333**	**318**
71	Cinema Operator																													1	1	1	1	**2**	**2**
72	Press Foreman																															1	0	**1**	**0**
73	Tractor Operator					2	0									13	8	12	12	4	4	10	5			5	4	37	40	15	14	2	2	**100**	**89**
74	Store man			1	1	3	4									4	4	7	6	3	4	2	1	0	1	5	5	32	24	14	13	3	4	**74**	**67**
75	Plant Yard Attendant					4	4																					10	2	4	6			**18**	**12**
76	Mechanic					27	24									3	2	5	3	1	0	3	2					2	3	4	2			**45**	**36**
77	Machinist					13	10											3	3											2	1			**18**	**14**
78	Carpenter					5	3									5	1	5	2	1	0	2	1					0	2	9	3	3	1	**30**	**13**
79	Mason					5	0									4	0	4	1	1	0	2	0					2	1	8	0	4	0	**30**	**2**
80	Electrician					3	5									3	1	5	2	1	0	1	0			6	4	2	1	3	1	1	0	**25**	**14**
81	Machine Minder																															4	3	**4**	**3**
82	Video Editor																															4	4	**4**	**4**
83	Audio Recorder																															4	4	**4**	**4**

No.	Designation	DG		Admin		Eng		Fin		Audit		PMEU		SEPC		FCRDI		HORDI		FRDI		RRDI		NRMC		SCPPC		SPMDC		ETC		ICC		Total	
		A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E
84	Technician					19	17							0	1	7	4	10	10	1	1	1	1			1	1	13	9	12	9	4	5	**68**	**58**
85	Video/ Photographer Assistant																															4	4	**4**	**4**
86	Composer																															4	3	**4**	**3**
87	Research Sub Assistant															25	19	24	19	10	4	10	6	2	2	9	7	0	1	0	2			**80**	**60**
88	Book Binder (Press)																															2	2	**2**	**2**
89	Bee Keeper																	0	2											12	7	1	0	**13**	**9**
90	Budder															3	2	6	8	11	11							43	39	8	8			**71**	**68**
91	Steward																													1	0			**1**	**0**
92	Cook																					2	2							38	30			**40**	**32**
93	Seedman																									30	29	0	1					**30**	**30**
94	Circuit Bungalow Keeper															4	3	5	4			2	2			2	2	7	8	2	2			**22**	**21**
95	Lorry Cleaner															0	1	1	1			0	1			3	2	21	8	2	1	1	1	**28**	**15**
96	Office Employee	4	5	23	26	3	2	10	9	1	1	1	1	1	0	6	4	6	6	3	1	5	4	1	2	9	7	3	10	21	16	3	2	**100**	**96**
97	Video Lighting Electrical Assistant																															4	4	**4**	**4**
98	Video Editing Assistant/Video Assistant/ Demonstration Assistant																															6	6	**6**	**6**
99	Waiter																													4	3			**4**	**3**
100	Watcher			6	8	12	11					2	0			89	78	69	63	37	42	36	31	2	3	67	63	191	189	115	110	30	30	**656**	**628**
101	Laborer	4	1	16	22	61	52	4	14	1	1	4	2	4	2	770	652	549	459	298	257	333	280	9	2	231	186	1613	1380	692	599	213	177	**4802**	**4086**
102	Sanitary Laborer			2	2													2	2							1	1	3	3	5	5			**13**	**13**
103	Contract Laborer	2	2	4	4	9	9	1	1			1	1	2	2	90	90	27	27	65	65	42	42	5	5	38	38	508	508	104	104	42	42	**940**	**940**
	Total	**31**	**18**	**204**	**209**	**256**	**227**	**153**	**152**	**19**	**16**	**38**	**26**	**71**	**48**	**1408**	**1082**	**1169**	**951**	**663**	**543**	**744**	**616**	**103**	**61**	**1071**	**844**	**3230**	**2775**	**2467**	**1909**	**629**	**475**	**12256**	**9952**

A – No. Approved E – No. Existing

DG – Director General's Office

Admin – Administration Division

Eng – Engineering Division

Fin – Finance Division

Audit – Internal Audit Unit

PMEU – Progress Monitoring & Evaluation Unit

SEPC – Socio Economic & Planning Centre

FCRDI – Field Crop Research & Development Institute

HORDI – Horticultural Crop Research & Development Institute

FRDI – Fruit Research & Development Institute

RRDI – Rice Research & Development Institute

NRMC – Natural Resources Management Centre

SCPPC - Seed Certification & Plant Protection Centre

SPMDC – Seed & Planting Material Development Centre

ETC – Extension & Training Centre

ICC – Information & Communication Centre