

ANNUAL REPORT 2021

NATIONAL INSTITUTE OF POST-HARVEST MANAGEMENT

Research and Development Centre
Jayanthi Mawatha, Anuradhapura
Sri Lanka

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National Institute Of Post Harvest Management
Jayanthi Mawatha
Anuradhapura.

Hon. Minister of Agriculture
Ministry of Agriculture
No 85/5, "Govijana Mandiraya"
Rajamalwatta Lane
Battaramulla

Hon Minister,

ANNUAL REPORT – 2021

In terms of section 14(2) of the Finance Act No 38 of 1971, we wish to submit Annual Report and Statement of Accounts of National Institute Of Post Harvest Management , for the year 2021.

Your faithfully



Prof. W.A.P Weerakkody

Chairman

National Institute Of Post Harvest Management

ACT AND LEGISLATIONS

The National Institute of Post-Harvest Management (Institute of Post-Harvest Technology) functioning under the purview of Ministry of Agriculture established on 19th June 2000 by the Extraordinary Gazette of the Democratic Socialist Republic of Sri Lanka No. 1137/10 for the purpose of carrying out post-harvest research and development on all agricultural crops. The newly established institute has taken over the functions of the Rice Processing Research and Development Centre (RPRDC) of the Paddy Marketing Board at Anuradhapura, which was set up with FAO/UNDP assistance in 1976. The new Institute has been assigned the functions and responsibilities for carrying out post-harvest research and development on not only rice and grains but also on other field crops, vegetables, fruits, spice crops and cut flowers. The name of the institute was changed as National Institute of Post-Harvest Management by the Extraordinary Gazette, 2093/26 of the Democratic Socialist Republic of Sri Lanka on 27.10.2018

MANDATE

According to the mandate given in the gazette notification, The National Institute of Post-Harvest Management is supposed to serve as the coordinating body to bring together all agencies concerned for the purpose of identifying and prioritizing the research needs and implementation of programs for the development of the postharvest technology in Sri Lanka.

VISION

To be the center of excellence in sustainable postharvest development for national food security

MISSION

Sustainable development of national food security through efficient and effective postharvest technological interventions to strengthen the supply and value chains of the agricultural produce and products with high quality and safe food, to cater to the domestic and export markets at competitive price.

BOARD OF MANAGEMENT

As at 31st December 2021

Chairman

Prof. W.A.P. Weerakkody

Vice Chairman

Mr. W.M. Manjula Hiroshana

Members

Dr. S.H.S. Ajantha De Silva

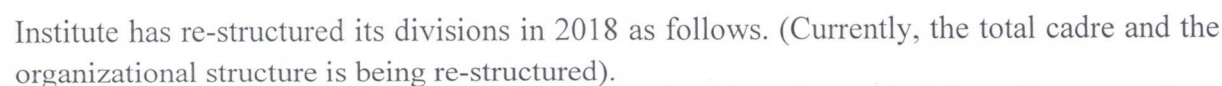
Mrs. S.A. Sriyani

Mr. Sarathchandra De Silva

Secretary to the Board

Eng. Mr. H.M.A.P. Rathnayake

Organization Structure as per the Scheme of Recruitment (SOR) approved



- 186

SENIOR MANAGEMENT

As at 31st December 2021

DIRECTOR/CHIEF EXECUTIVE OFFICER (Acting)

Eng. H.M.A.P. Rathnayake

ADDITIONAL DIRECTOR (RESEARCH AND TECHNOLOGY TRANSFER)

Eng. H.M.A.P. Rathnayake

ADDITIONAL DIRECTOR (ADMINISTRATION AND FINANCE)

Mr. R.K.A.P. Ramanayake

RESEARCH DIVISION

Dr. (Mrs.) R.M.N.A Wijewardhane
HOD | Principal Research Officer

ENGINEERING DIVISION

Eng. B.D.M.P. Bandara
HOD | Senior Mechanical Engineer

TECHNOLOGY TRANSFER DIVISION

Mr. W.M.C.B. Wasala
HOD (Acting) | Principal Research Officer

PROJECT MANAGEMENT DIVISION

Mr. W.M.C.B. Wasala
HOD | Principal Research Officer

LABORATORY SERVICE DIVISION

Mr. C.R. Gunawardhane
HOD | Senior Research Officer

PLANNING AND MONITORING DIVISION

Dr. (Mrs.) R.M.R.N.K. Ratnayake
HOD | Senior Research Officer

ACADEMIC DIVISION

Dr. (Mrs.) D.M.S.P. Bandara
HOD | Senior Mechanical Engineer

ADMINISTRATION DIVISION

Mr. R.K.A.P. Ramanayake
HOD | Additional Director (Admin & Finance)

INTERNAL AUDIT DIVISION

Mr. R.M.D. Rathnayake
HOD | Internal Auditor

FINANCE DIVISION

Mr. I.M.N.P. Illangasinghe
HOD | Accountant

MANAGEMENT COMMITTEES

As at 31st December 2021

AUDIT AND MANAGEMENT COMMITTEE

Name	Position
Mrs. S.A. Sriyani	Chairman
Dr. S.H.S. A. De Silva	Member
Mr. Sarathchandra De Siva	Member
Eng. H.M.A.P. Rathnayake	Secretary
Mr. R.M.D. Rathnayake	Convenor
Mr. J.A.S.D. Perera	Observer
Mr. U.S.L. Kumara	Observer

RESEARCH ADVISORY COMMITTEE

Name	Position and Place
Dr. Ajantha De Silva	Additional Secretary, Agriculture Technology Division, Ministry of Agriculture.
Prof. S.B Nawarathna	Senior Lecturer, Faculty of applied science, University of Sri Jayawardanepura.
Dr. Rohitha Prasantha	Senior Lecturer, Faculty of Agriculture, University of Peradeniya.
Dr. J.W. Damunupola	Senior Lecturer, Faculty of Science, University of Peradeniya.
Prof. L. Suriyagoda,	Senior Lecturer, Faculty of Agriculture, University of Peradeniya.
Prof. Sanath Amarathunge	Senior Lecturer, Faculty of Agriculture, University of Peradeniya.
Ms. Nilamani Yapa	Senior Lecturer, Faculty of Applied Science, Rajarata University of Sri Lanka.
Mr. Haridas Fernando,	Group General Manager (Agri business). Cargils Ceylon PLC.
Prof. K.H.Sarananda	Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka
Dr. S.D.G.S.P. Gunawardana	Senior Lecturer , Faculty of Engineering University of Peradeniya

RESEARCH RELEASING COMMITTEE

Name	Position
Dr. (Mrs.) R.M.N.A. Wijewardana	Chairman
Mrs.G.D.N.Manike	Secretary
Mr. W.M.C.B.Wasala	Member
Mr. B.D.M.P. Bandara	Member
Dr.(Mrs.) R.M.R.N.K.Ratnayake	Member

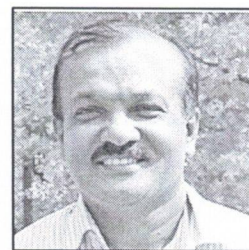
CHAIRMAN'S MESSAGE

The National Institute of Postharvest Management (former the Institute of Post-Harvest Technology –IPHT-), operating under the Ministry of Agriculture, covers up all areas of postharvest sector with the goal of enhancing food security in the country. IPHT was established on 19th June 2000 by the Extraordinary Gazette of the Democratic Socialist Republic of Sri Lanka No. 1137/10 under the provisions of the State Agricultural Corporations Act. No. 11 of 1972 for the purpose of carrying out postharvest research and development activities pertaining to cereals, pulses, oil seeds, other field crops, fruits, vegetables, spice crops and ornamental plants. The name of the institute was changed as National Institute of Post-Harvest Management by the Extraordinary Gazette, 2093/26 of the Democratic Socialist Republic of Sri Lanka on 27.10.2018.

Year 2021 was no difference to the previous year with respect to the challenges faced by the staff on their traveling and team work. In addition national organic agriculture program imposed on April, 2021 affected the farming practices of many commercial cropping systems, affecting the programs of the NIPHM. Our main challenge was to continue with the research and developmental activities to solve the issues in postharvest sector despite the COVID pandemic. However, with the aim of ensuring national food security, the institute was able to successfully conduct 13 state funded research projects, 09 state funded developmental projects and 01 foreign funded research project during 2021. All these projects addressed the key issues of supply and value chains of economically important agricultural commodities. Research projects mainly focused on developing technologies to minimize postharvest losses through improving supply and value chains of agricultural crops by addressing the existing gaps at critical loss points.

Regarding the developmental activities, proper post-harvest practices of rice, grain legumes, fruits, vegetables and spice crops were

introduced to the supply chains especially through subsidized technology transfer programs and awareness

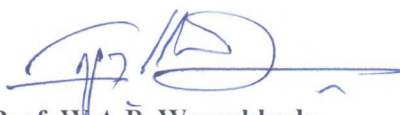


developments. Since the methods of transportation have been identified as the key points in minimization of postharvest losses, both in quantity and quality, the development project on 'Introduction of safe packages for handling and transportation of fruits and vegetables' was continued in the year 2021 too.

Compared to other government institutions, NIPHM was much blessed to do conduct almost all R and D projects and also a number of training sessions and thus spend the allocated funds 70 – 90 %. Further to this, filling essential cadre positions, maintain assets (including regional offices), upgrading library facility, restructuring the office network and settling some dragging issues were the other significant progress reported by the institute.

Finally, with the success of these activities, reduction of postharvest losses is expected and it would lead to create a marked impact on agriculture of the country while uplifting the nation.

Based on the experience gathered during the year of 2021, I am confident that the institute would be able to improve the postharvest industry in the coming years.

A stylized blue ink signature of Prof. W.A.P. Weerakkody, featuring a large, flowing 'W' and 'P'.

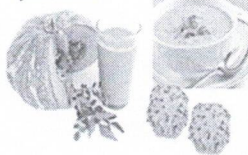
Prof. W.A.P. Weerakkody
Chairman

YEAR AT A GLANCE

All the activities conducted in the year 2021 were directly related to achieving sustainable development goals (SDG) by 2030 namely, **Goal 2:** End hunger, achieve food security and improved nutrition and promote sustainable agriculture, **Goal 12:** Ensure sustainable consumption and production pattern. Programmes and projects proposed by the institute to achieve these two goals also address to the SDG **Goal 1:** End Poverty.

Postharvest Technologies ready to be disseminated...

Pumpkin based products



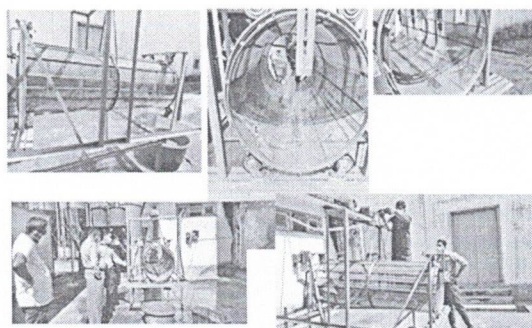
Sour sop based products

Banana and jackfruit based products

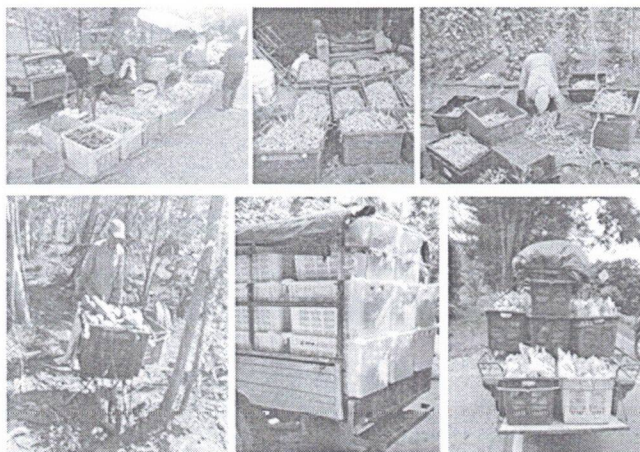


Thirteen research projects were conducted and some of the technologies developed through research are being introduced/ready to be introduced to the field.

Carrot washer



Minimization of postharvest losses during handling and transportation of fruits and vegetables

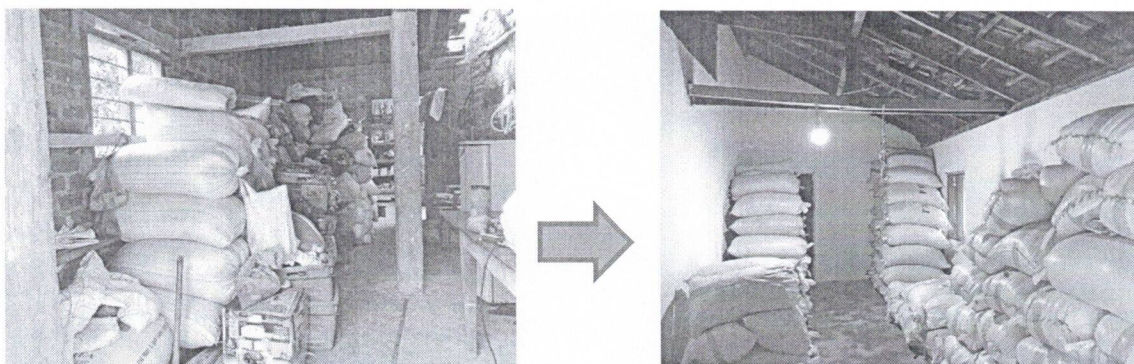


If the post-harvest losses during transportation can be reduced by 10%, about Rs. Mn. 5800 can be saved annually.

In 2021, 31240 plastic crates were provide to all the stakeholders of the supply chain; Growers, collectors, transporters, wholesalers and retailers

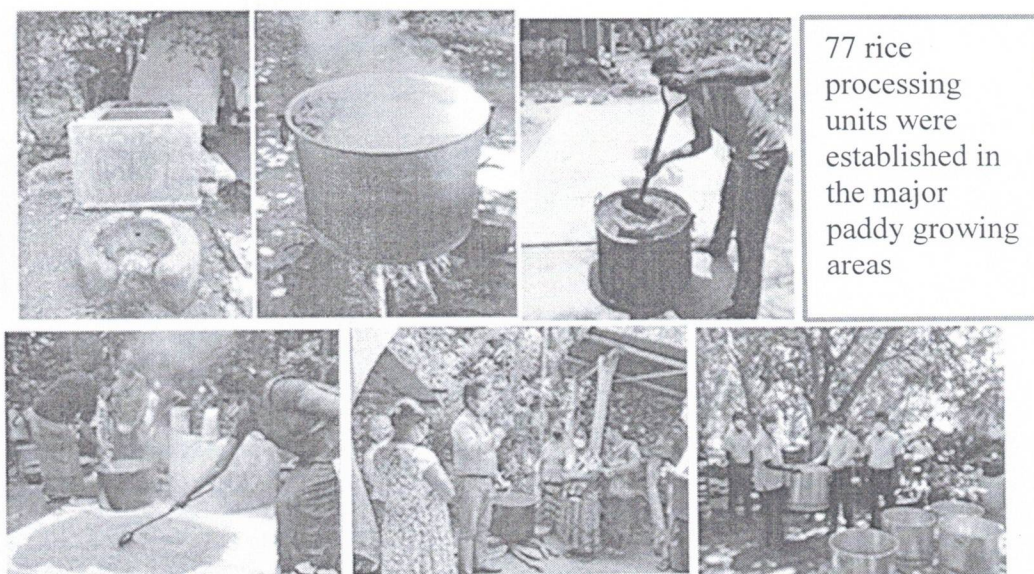
Nine development projects were conducted and proper postharvest technologies were implemented in the field. Income generating self employments were initiated through the establishment of these agro processing industries.

- **Development of on-farm storage facilities of rice, maize and pulses to increase the farmers' income**



68 on-farm Storages were improved

- **Development of cottage level rice processing industry**



Posharvest loss assessment of selected agricultural food crops.

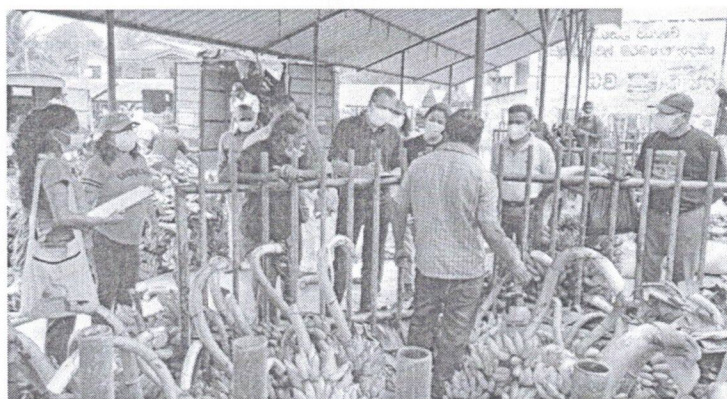
Implementation of proper postharvest practices in the field has reduced the postharvest loss significantly. Therefore, updating current figures of postharvest losses is highly important. Results of the recent studies have revealed that current postharvest loss in mango supply chains (supply chains improved by NIPHM) was reduced to 7% from 40%.

EXECUTIVE REPORT

The Year 2021 was a very challenging year to the institute. All the key activities of the institute; Research, Development Projects, Technology Transfer activities, Consultancy, Laboratory and Engineering services had to be completed even amidst the Covid pandemic. However, the institute was able to complete almost all the planned activities with a little deviation. Those key activities were aligned for the improvement of supply and value chain management practices of agricultural crops with special focus to the fruits and vegetable sector of the country. And also, all these activities were directly related to achieving sustainable development goals (SDG) by 2030 namely, *Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture*, *Goal 12: Ensure sustainable consumption and production pattern*. Further these activities also addressed to the *SDG Goal 1: End Poverty*. Thus we were able to stride towards the vision of the institute 'To be the center of excellence in sustainable postharvest development for national food security'.

RESEARCH

The research and development programme of the institute was directed towards solving technological and socio economic problems confronting the postharvest industry. During the year 2021, twenty five (25) research projects were carried out. It consisted with four (04) research projects continued from 2020 (funded by the Ministry of Agriculture under 'National food production Drive'), nine (09) research projects initiated in 2021 and four (04) research projects that were conducted as public-private partnership projects thus funded by the private sector. In addition to that, eight (08) research projects were conducted by undergraduate students from different universities and they were supervised by the Research officers, Extension officers and the Engineers of the institute.

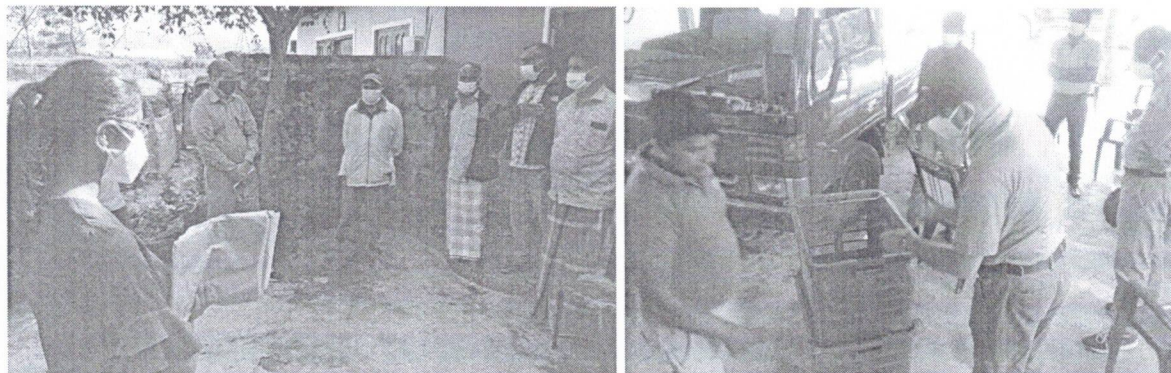


Assessment of postharvest losses of banana

Furthermore, one foreign funded research project, "Strengthening Sri Lanka's efforts to quantify greenhouse gases related to postharvest losses" was conducted as a collaborative research project with a research team of Engineering Faculty, University of Peradeniya.

DEVELOPMENT PROJECTS

The development projects were carried out by the institute in order to ensure technology adoption and their impact on the postharvest industry with special emphasis on agribusiness development and assuring food security. During the year of 2021, nine development projects were conducted by the institute.



Information gathering from the farmers: project- Developing a technologically sound regional distribution network for fruits and vegetables

TECHNOLOGY TRANSFER ACTIVITIES (Training & Extension)

The training activities were aimed towards updating the knowledge and to ensure effective technology transfer activities to the large number of stake holders involved directly or indirectly in supply chain and value chain activities. These included farmers, collectors, whole sellers, retailers, processors, extension personals, students from universities and other educational institute and beneficiaries of government and non-governmental organizations. During the year 2021, 75 training programmes were conducted and 1452 stake holders were trained on proper post harvest technologies. In addition to that, 102 new entrepreneurs were introduced to the agro based industries and these industries include 18 brands of spice based products, 43 brands of rice based products, 05 brands of dehydrated fruit products, 32 brands of fruit based products and 04 pulse based producers.

These activities were conducted island wide by Research and Development center in Anuradhapura and the district centers at Kurunegala, Kandy, Nuwara-Eliya, Ampara, Hambantota and Kilinochchi in liaison with the department of Agriculture, Department of Agrarian Service, provincial councils, Mahaweli Authority of Sri Lanka and Non-governmental organizations.



Training programmes

CONSULTANCY AND OTHER SERVICES

NIPHM provides consultancy and other services to public, private and cooperative sector organizations that are either directly or indirectly involved in the post-harvest industry. Through this, services were given to establish new processing plants, modernizing of existing mills and plants and to solve technological problems encountered by rice millers and other food processors in their day-to-day operations. NIPHM helped to prepare technical report, feasibility report and special reports for any agro food processing industry as per their request. Institute supported the stakeholders by providing laboratory and engineering services especially for the quality control activities both in industrial products and process lines. Laboratory services consist of chemical, physical and microbiological services. Fumigation of warehouses is another service given by the division of laboratory services to the stake holders. Engineering services consists of machinery/equipment testing and evaluation and operator training. In the year 2021, the institute was able to provide 21 consultancies for the postharvest industry island wide.

SOCIAL, WELFARE AND RELIGIOUS ACTIVITIES

Strengthening institutional governers is one of the goals of the institute. Employee satisfaction is vital to the growth of the organization. Therefore, various social, welfare and religious programmes and activities are organized annually to achieve this goal.

However, the institute was unable to conduct such activities in 2021, due to the Covid 19 pandemic.

FINANCIAL PERFORMANCE

Description	2020 (Rs. Mn.)	2021 (Rs. Mn.)	Growth (%)
Deficit for the Year	4.7	2.2	53
Cash Equivalent	30.8	37.6	22
Total Current Asset	46.9	67.4	43.7
Total Current Liabilities	33.4	39.6	18.6
Net Asset (Equity)	273.3	373.7	36.7

HUMAN RESOURCE DEVELOPMENT

Although it was not able to conduct human resource development activities as planned, due to the Covid situation, research and development staff members were able to participate in 14 online training programmes.

Overall, 2021 was a year of achieving goals in the midst of many obstacles.



Eng. H.M.A.P. Rathnayake
Director/CEO (Acting)

PERFORMANCE HIGHLIGHTS

RESEARH AND DEVELOPMENT

The research and development programme of the institute was directed towards solving technological and socio economic problems confronting the postharvest industry. During the year of 2021, twenty five (25) research projects were conducted by the institute; among them, 04 research projects were funded by the Ministry of Agriculture and total funds received was Rs. Mn.1.6945; Nine research projects were conducted using the financial allocations of the institute given by Treasury and the total funds received was Rs. Mn. 3.254. Eight (08) projects were conducted as student research projects and undergraduate students were engaged with them. Four (4) research projects were conducted to solve the issues in industries and they were funded by respective private industries. Details of the research programme are listed below.

In addition to disseminating the research finding as new technologies within the postharvest sector for its improvement, the results of the studies were published in peer reviewed national and international journals, Institute of Engineers of Sri Lanka, Symposia conducted by different universities.

Summary of the Research projects are shown in the table below.

	Project Title	Date of Commence ment	Approve d Budget (2021)	Financial Progress (as at 31.12.2021)		Physical Progress (%)
				Rs. Mn	%	
1	Research Projecs Continued from 2020 to 2021					
1.1	Mitigating rice stickiness to enhance consumer preference through accelerated aging of fresh paddy.	01.07.2019	0.1235	0.12293	99.53	100
1.2	Investigation of nutritional and medicinal properties of value added products from sour soup (<i>Annona muricata</i>).	01.09.2019	0.01	0.009	90.6	100
1.3	Development and performance evaluation of washing equipment for carrot (<i>Daucus corotaL</i>) combined with ozone treatment.	01.10.2019	0.155	0.1549	99.8	85
1.4	Enhancement of quality characteristics in dehydrated fruits by optimizing process parameters of dehydrating technologies.	01.02.2019	1.406	1.4056	99.97	100

2	Research Initiated in 2021					
2.1	Study on present status of postharvest practices & loss assessment of selected agricultural food crops.	01.01.2021	1.438	0.082	5.7	55.7
2.2	Economic analysis at different postharvest stages and farmers willingness to store of selected economically important food grains	01.01.2021	0.161	0.0152	9.44	42.9
2.3	Design and development of monkey and rat repellent device	01.01.2021	0.033	0.003	9.09	50
2.4	Reduction of postharvest losses of <i>Allium cepa</i> L. <i>aggregatum</i> group by improved postharvest technologies	01.01.2021	0.148	0.1377	93.04	43.3
2.5	Potential of substituting wheat flour by jackfruit and breadfruit flour in food products and evaluating their functional properties and sensorial attributes	01.01.2021	0.071	0.049	69.01	63.8
2.6	Effect of carbohydrate profile and gluten content for the replacement of wheat flour with <i>Dioscorea alata</i> (rajala)	01.01.2021	0.02	0.019	95	45
2.7	Survey on rice mills and other food grinding mills	01.01.2021	0.246	0.0192	7.8	70
2.8	Design and Development of a process line for groundnut oil extraction	01.01.2021	0.811	0.6922	85.35	88.8
2.9	Development of a science based protocol for postharvest handling of Avocado	01.01.2021	0.326	0.316	96.93	100

Private Funded Research Projects

1. Design and Development of process line for extraction of cashew nut shell oil in Sri Lanka. Research was funded by Udaya Industries pvt Ltd, kandy
2. Effect of different fruit covers on postharvest quality of mango and guava. Research was funded by Ellawala Horticulture (Pvt) Ltd. Dambewatana, Galkiriyagama
3. Development and quality evaluation of osmotically dehydrated fruit pieces. Research was funded by Ceylon nutria products pvt Ltd, 103/59, Roland Park, Weligampitiya, Jaela.
4. Development of organic rice based dairy free drinks. Research was funded by Research was funded by Ceylon nutria products pvt Ltd, 103/59, Roland Park, Weligampitiya, Jaela.

Student Research Projects

No.	Student	University	Supervisor	Research Title
1	A.M.H.G.N.K.Abeyrathne	Jaffna	Mr.W.M.C.B.Wasala	The effects of different fruit covers on postharvest quality of guava
2	D.M.S.M.Dissanyake	Jaffna	W.B.W.M.R.C.P.Aluwihare	Quality improvement of selected fruit varieties by using freeze drying technology
3	G.I.P. Ihalagama	Jaffna	Dr.R.M.N.A.Wijewardane	Development of Moringa enriched tomato based soup cube
4	D.G.S.K.Gunasekera	Rajarata	Dr.R.M.N.A.Wijewardane	Identification of suitable low temperature storage condition for green chilli and condition in treatments before retailing
5	R.M.P.N.Rathnayake	Rajarata	Mr.W.M.C.B.Wasala	Artificial ripening of mango using solar evaporative cooling technology
6	A.M.H.S Shalinda	University of Vocational Technology	Mr. W.M.C.B.Wasala	Improving the postharvest quality of banana(using the Cavendish banana variety)
7	B.N.N.Silva	Uva Wellassa	Mr. Kasun Hettige	Development of probiotic frozen yoghurt by incorporating soursop
8	U.P.L.M. Lionel	Uva Wellassa	Dr. Nilanthi Wijewardana	Development of avocado based supplement food

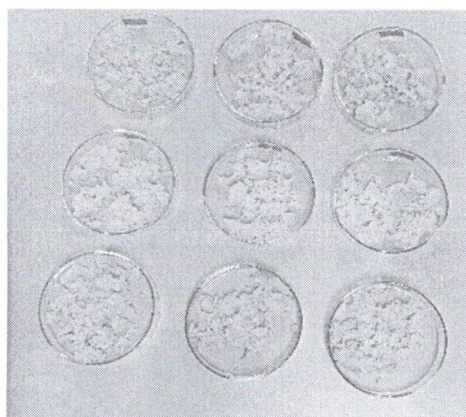
PROGRESS OF THE RESEARCH PROJECTS

Research Projects continued from 2020

1. Mitigating rice stickiness to enhance consumer preference through accelerated aging of fresh paddy

Stickiness of freshly harvested rice is one of major problems which has directly influenced the rice millers in Sri Lanka. In Sri Lanka most of rice millers are either small scale or medium scale. This problem has added an additional cost for rice millers to provide storage facilities for the freshly harvested rice throughout the natural aging period until they turn into a form preferred by the consumers. Simultaneously this can be considered as a non-economic aspect due to storage space requirement, insect damage, and high operating and maintenance cost. By considering the requests emerged at the stakeholder meetings held at National Institute of Post - Harvest Management, this research project was carried out to find out whether the dry heat treatments and steam heat treatments as artificial aging methods are successfully imparting best organoleptic, physical and chemical properties in rice cooked using freshly harvested paddy.

Freshly harvested BG 352 paddy was subjected to dry heat treatment, dry heat treatment followed by standard parboiling procedure, steam heat treatment and steam heat treatment followed by standard parboiling procedure. The treated samples were analyzed for physical, chemical and organoleptic parameters. The final output of the study is to cut down the holding costs during natural aging of freshly harvested paddy from present average holding cost of Rs.30 million/ miller. The total financial allocation for the project was Rs Mn. 5.21. The total expenditure from the 01/07/2019 to 31/12/2021 was Rs Mn. 4.75; 2019 allocation and expenditure were Rs. Mn. 0.013 and 0.0126 respectively, 2020 allocation and expenditure were Rs. Mn 5.07 and 4.62 respectively while 2021 allocation and expenditure were Rs. Mn. 0.1235 and 0.123 respectively (Total Financial progress is 91.32%). Findings of this research cut downs the holding costs of paddy, hence provides more benefits to Farmers and millers. Total Physical progress is 100%



Cooked rice samples of steam heated fresh paddy

2. Investigation of nutritional and medicinal properties of value added products from soursop (*Annona muricata*).

Soursop (*Annona muricata*) has a wide distribution throughout tropical and subtropical parts of the world and mainly in developing countries including Sri Lanka. It is available in throughout the year. Currently in Sri Lanka, people utilize soursop mostly as a fruit juice. But there are very high potential of various product range and value addition from soursop. It also delivers a nutritious fruit among people and gives lots of health benefits.

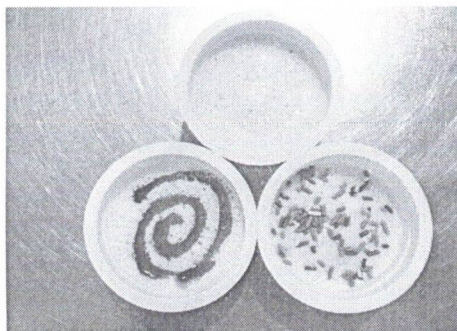
The objective of this research is to develop value added food products from soursop and analysis of nutritional value of developed food products. The main value additions of this research are control the discoloration of dehydrated soursop powder and probiotic frozen yogurt from soursop fruit and herbal tea from soursop leaves.

The dehydrated soursop powder was treated with citric acid, ascorbic acid, combination of citric + ascorbic (1:1 ratio) and sodium metabisulfite with and without blanching treatment to control the discoloration. They were compared with the control which has no chemical treatment. Sensory results revealed that the best discoloration treatment is 0.1% sodium metabisulfite without blanching. Developed soursop powder could be stored for twelve weeks at ambient conditions without adding any preservative.

Herbal tea was developed by using mature soursop leaves. Leaves were dehydrated and grinded to obtain leave powder. According to the sensory evaluation, best product is 50% soursop leaf powder + 45% green tea + 5% cinnamon powder.

The probiotic frozen yogurt was made by incorporating soursop pulp to milk and fermented with probiotic culture containing *Bifidobacterium bifidum* and *Lactobacillus acidophilus*. 20% soursop pulp added frozen yogurt evaluated as the best product in sensory evaluation. This could be stored for eight weeks in frozen conditions without adding any preservative. Probiotic growth is significantly higher in soursop incorporated frozen yogurt compared to plain frozen yogurt.

Total allocation for the research was Rs. Mn. 0.245 and the total expenditure was Rs. Mn. 0.162 (2019 allocation- Rs. Mn. 0.00954 and Expenditure Rs. Mn. 0.00954, 2020 allocation- Rs. Mn. 0.225 and Expenditure Rs. Mn. 0.143, 2021 allocation- Rs. Mn. 0.01 and Expenditure Rs. Mn. 0.009). Financial progress 91.34% and the physical progress-100%.,

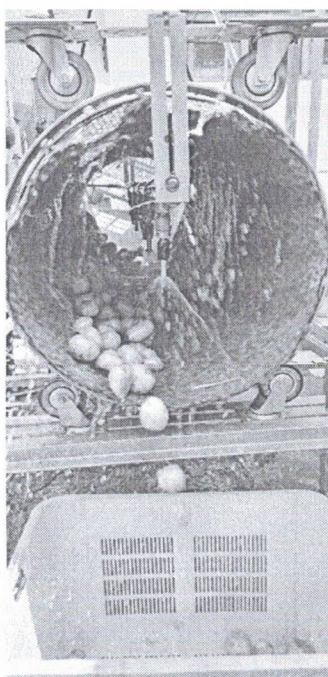


Probiotic incorporated soursop frozen yogurt

3. Development and performance evaluation of washing equipment for carrot (*Daucus carota* L) combined with ozone treatment.

Carrot (*Daucus carota* L.) Potato (*Solanum tuberosum*) and Radish (*Raphanus raphanistrum*) are economically important vegetable crops in Sri Lanka. The major problems associated with commercial cultivation are excessive postharvest loss during storage due to the soft rot caused by bacteria like *Erwinia carotovora* subsp. *atroseptica* and *Erwinia carotovora* subsp. *carotovora*. As a solution, there is a potential of using ozone as a pre-treatment to disinfect bacteria and other microorganisms on crop surfaces. Ozone is unstable with a short half-life. Ozone decomposes to form oxygen; therefore, food products treated with ozone are free of chemical residues. Apart from that Washing vegetables is necessary to remove soil and other foreign material before sorting, grading, weighing and selling in the market. But, presently the grower brings vegetables to the market, either unwashed or inadequately washed under unsanitary conditions. Therefore there is a need of developing an efficient and effective vegetable washing system that minimizes post-harvest losses by damages and bruises.

The objective of this research was to develop washing equipment combined with ozone treatment to remove pathogens and other inert materials from vegetable surfaces. The selected vegetables were washed using the designed washing equipment and ozone treatments were done for the washed vegetables and those trials have given successful results. The output of this research was the availability of washing equipment for efficient cleaning of vegetables and a protocol for controlling soft rot disease by application of ozone and the outcome was the extension of the shelf life of vegetables by controlling soft rot disease and efficient washing of vegetables without damages. The total financial allocation for this research was Rs. Mn. 0.479 and the total expenses were Rs. Mn 0.344 (2020 allocation- Rs. Mn. 0.324 and Expenditure Rs. Mn. 0.190, 2021 allocation- Rs. Mn. 0.155 and Expenditure Rs. Mn. 0.154). Financial progress 71.81% and the physical progress-100%.

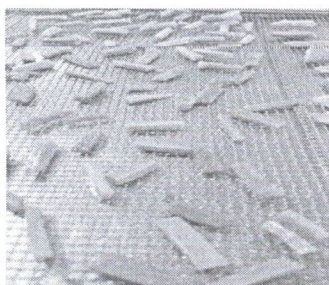


Developed washing equipment

4. Enhancement of quality characteristics in dehydrated fruits by optimizing process parameters of dehydrating technologies

Post-harvest loss is high in fruit sector due to perishability and seasonality of production. Drying is one of the widely used food preservation method which can reduce post-harvest losses and added value to fruits. World demand for dried fruit is increasing because of its multi usages. Dried fruits are considered a super fruit snack with high nutritional value, full of vitamins which appeals to health aware international markets. Today the potential for dehydration is greater than ever. Pretreatment plays an important role to prevent enzymatic browning in fruits. Most of the food products are pretreated to minimize the drying time, improve taste and structure, to conserve flavor and to protect the nutrition of the food before dehydration. But the pretreatment methods should be cost effective and easy to conduct even by small and medium scale producers. Main objective of this research was improving quality characteristics of selected fruits (Mango, Papaya, Banana, Guava, Pineapple and Riped jack fruits), as suitable for the export market, by manipulating various parameters involving in dehydrating process. Project outputs and expected outcome were introduce alternative approaches to preserve the surplus of fruits produced during the season and minimizing issues pertaining to the supply and the value chain of fruits, popularize consumption and food applications of dehydrated fruit products in Sri Lanka and indirectly enhance the consumption of fruits to build up healthy nation and to introduce novel technologies and techniques, relevant to the fruit dehydration, to the dehydrated fruits manufacturing industries in different scales, through the technology transferring activities.

The selected fruit samples were prepared for the dehydration by peel out and slicing into uniform sizes and subjecting to pretreatments processes by applying several chemical treatments (sodium meta bisulfite and citric acid) and non-chemical treatments (blanching techniques). The ideal pretreatment was identified for each fruit item. Pretreated fruit samples were subjected to different drying techniques. Pretreated fruit samples received the highest scores for all sensory attributes in comparison with the untreated (control) one. Comparatively best quality shows in freeze dried fruit samples than other drying methods. However freeze drying is very expensive because its capital cost and running cost are very high. Therefore heat pump drying can be recommended for small scale and medium scale stake holders in Sri Lanka due to its low running cost, moderate capital cost and can produce good quality product as well. Total financial allocation for this research was Rs. Mn. 8.224 (2019- Rs. Mn. 0.470, expenditure Rs. Mn. 0.416, 2020 allocation- Rs. Mn. 6.348 and Expenditure Rs. Mn. 4.369, 2021 allocation- Rs. Mn. 1.406 and Expenditure Rs. Mn. 1.4056). Total financial progress -75.88% and the physical progress-100%.

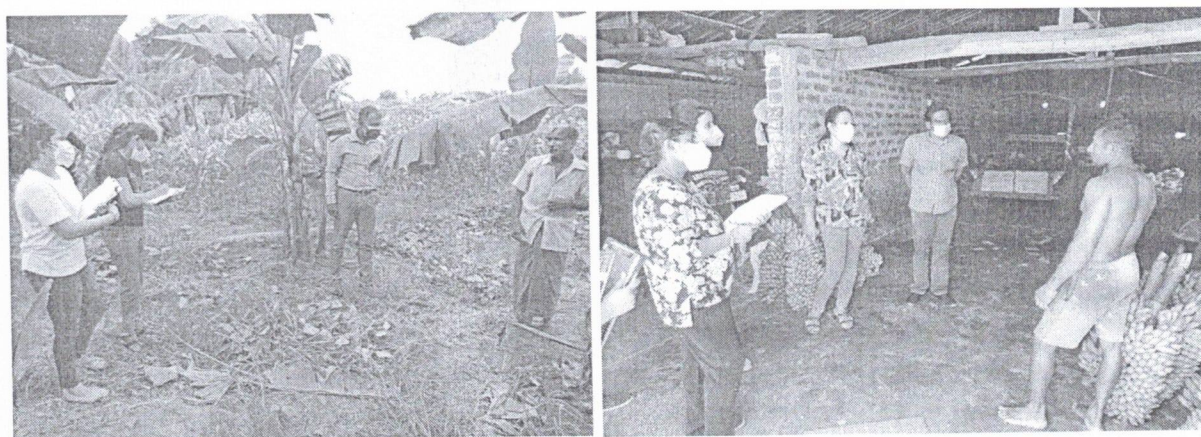


Dried Papaya using heat pump dryer

Research Projects initiated in 2021

01. Study on present status of postharvest practices & loss assessment of selected agricultural food crops.

During the past two decades The National Institute of Post Harvest Management carried out different activities to improve the post harvest sector of perishables. However, no studies have been conducted so far to determine whether there has been a positive growth in the postharvest sector. This research was initiated to identify current postharvest practices and losses in a more generalized form which represent the whole scenario of supply chain of fruits and vegetables. Therefore, the National Institute of Post Harvest Management (NIPHM) is planning to carry out a study on present status of postharvest practices, loss assessment and determination of the pesticide residual levels present in selected agricultural food crops. The project will be conducted for selected grains (paddy and maize), fruits (guava, papaya, pineapple, avocado, rambutan) and vegetables (carrot, capsicum, cabbage, tomato, beet root, bitter gourd, green chilli, long bean, brinjal) and big onion, where these data are not available or out dated. Financial allocation for the research (2021) was Rs. Mn. 1.438 and the expenditure was Rs. Mn. 0.082. Physical Progress 55%. Project duration 2 years, 2021 and 2022. Total allocation for the research is Rs. Mn. 4.892. Project duration 3 years.



Gathering data from different stakeholder groups of the supply chain

02. Economic analysis at different postharvest stages and farmers willingness to store of selected economically important food grains

Post harvest loss (PHL) of food grains is higher in developing countries compared to the other developed nation,. This is assisted by several reasons or factors such as, inappropriate harvesting, threshing, drying, storing, transportation as well as milling. PHL of grains in Sri Lanka is ranging from 10 to 15%. In paddy, 7.5% of the loss occurs at the time of storage, which is nearly half of the total loss of paddy according to the FAO data. As this is a huge economic loss to the country and affecting self-sufficiency, National Institute of Post Harvest Management (NIPHM) and several other government and Non-government

organization try to facilitate the farmers to store their paddy and other grains themselves in a safe method to reduce loss as well as to increase the profitability of farmer from those grains. However, the farm level storage of paddy and other grains is not in accepted level. This may be due to several reasons, such as credit, storage space, cost of storage, willingness to storage, opportunity cost and profitability. Although there are ample studies on PHL of food grains, number of studies for above mentioned reasons are less. And also, the most of the data in those studies are outdated. Moreover, there are no any studies to gather data on willingness to storage of food grains for Sri Lankan situation. Therefore, it is crucial to conduct a thorough study now on the storage and profitability at each post-harvest stage to ensure proper planning to reduce the loss of food grains. In this background, this research aims to update the existing data and to find the farmers' willingness to storage (WTS), Opportunity cost of storage, factors affecting farm level storage of food grains with different price level and the change in the profit at every post harvest stages of grains. Cereals-Paddy, Maize, Finger millet, and pulses-Soya bean, Black gram, Green gram, Cowpea were selected as economically important food grains for this study. Furthermore, this research study is most important to maintain the self-sufficiency and food security of paddy and other grains in the nation. In the year 2021, questionnaires were prepared and they were pre tested in the field. Field activities will be conducted in the year 2022. Financial allocation for the research (2021) was Rs. Mn. 0.161, however, it was not spent since most of the field activities were not conducted due to Covid 19 pandemic situation in the country. Physical Progress 43%. Project duration 3 years, 2021,2022 and 2023. Total allocation for the research is Rs. Mn. 2.4.

03. Design and development of monkey and bat repellent device

Canopy level pest attacks in agriculture has been identified as one of the most important factors that endangers the national food security. Many research attempts are found to minimize the damage of insect pests and fungal pathogens where the least concern is given to control canopy level pests. Canopy level pests that directly reach the canopy of tall fruit trees and spices are the most difficult group to implement control measures compared to animal pests that walk along the ground. Continuous observations and control of animal attacks are highly recommended due to the unpredictable nature of animal pest attacks.

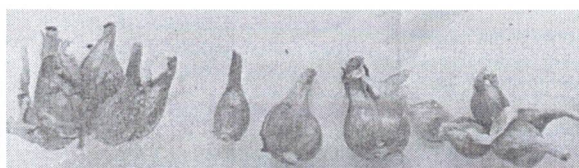
When considering Sri Lankan situation tall canopy fruit trees and spices are severely affected by animal pests. Also, no research evidence is found to address the canopy level animal pest attack in Sri Lanka. Hence, the needs of new technological strategies were identified to repel animal pests that damage tall canopy fruit trees.

Hence, the study was designed aiming to minimize the damage on yield, quality, flower buds and other vegetative parts of tall and seasonal bearing tropical fruit species due to monkey and bat attacks at home gardens, mini orchards and large farms.

Objective of the study was to reduce of post-harvest losses of fruit crops with automated electronic device in which the specific sound and light frequency ranges of the selected animals can be repelled easily. After having ethical approval to conduct the research, information gathering on historical studies and appropriate methods on canopy level pest control is in progress now. And also, designing of a prototype electronic device is in progress. Financial allocation for the research (2021) was Rs. Mn. 0.033 and the expenditure was Rs. Mn. 0.003. Physical Progress - 50%. Total financial allocation- Rs. Mn. 2.83. Project duration 3 years, 2021,2022 and 2023.

04. Reduction of Postharvest Losses of Red Onion (*Allium cepa* L. *Aggregatum*) through Improved Postharvest Practice

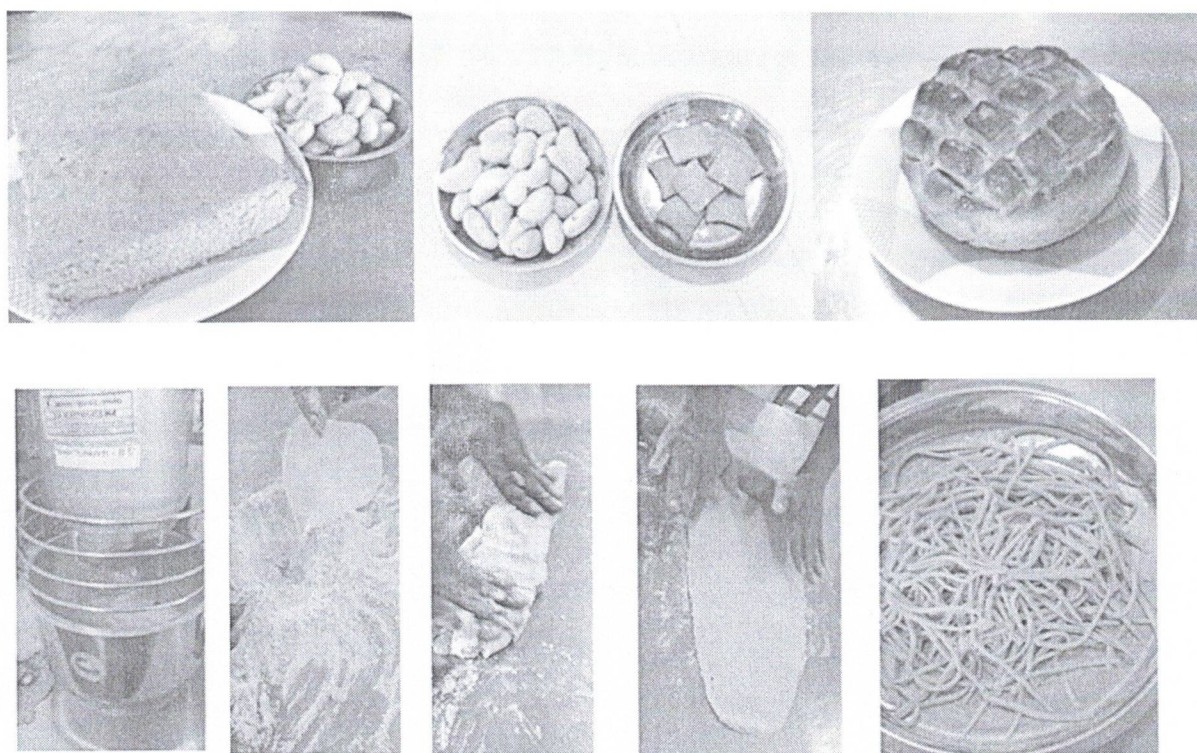
Red onion farmers are constrained due to high postharvest losses mainly during storage period and farmers are required to store onion for about six months to supply seed onions (bulbs) for next cultivation season. Therefore, this research was executed with the objective of reducing the postharvest losses of red onion and increasing the postharvest shelf life thereby to increase the economic states of red onion farmers. Pre-trials were conducted to test the effectiveness storage of onion under room condition followed by shade curing with and without foliage. The total loss after three months of storage was comparatively less for the treatment that was cured with foliage. Currently, curing practices (Shade curing and artificial curing) and storage practices (Temperature and RH) are being tested to select the best practice to minimize the postharvest loss and extend the shelf life. Red onion farmers and traders will be benefited by especially minimizing the storage rotting loss. Financial allocations for the year 2021 were Rs.Mn. 0.148 where Rs. Mn. 0.138 was expended. Physical progress- 43.3%. (In the year 2019 a research was conducted to develop a technology to minimize postharvest losses in big onion. However, the developed technology can not be directly applied to red onion since all the cultural practices are different in red onion in addition to the morphological and genetical variability. Therefore, this research was initiated in 2021. Total financial allocation- Rs. Mn. 0.27. Project duration 2 years, 2021,2022.



Red onion after harvesting

05. Potential of substituting wheat flour by jackfruit and breadfruit flour in food products and evaluating their functional properties and sensorial attributes

In Sri Lanka, there is a considerable post-harvest loss prevailing in Jackfruit bulbs, jackfruit seeds and breadfruit due to perishable nature and short shelf life and there is a current need of extending the storage period of these crops. There is a huge potential of substituting wheat flour with jackfruit bulb flour, seed flour and breadfruit flour which increase the nutrient content of the final product. And also value addition to that flour will create a demand for cultivating jackfruit and breadfruit in Sri Lanka. The proposed research aims to study the ability to produce the composite flour by incorporating jackfruit bulb flour, seed flour and breadfruit flour into wheat flour and identify the most appropriate ratio of wheat flour and jackfruit bulb flour, seed flour and breadfruit flour to examine its performance in bakery items production and other cottage level products like Noodles. This research will be continuing in 2022 too. Total allocation for the research (2021) was Rs. Mn. 0.071 and the expenditure was Rs. Mn. 0.049. Total financial allocation- Rs. Mn. 0.11. Project duration 2 years, 2021 and 2022.



Products developed from jack fruit and bread fruit based flour

06. Effect of carbohydrate profile and gluten content for the replacement of wheat flour with *Dioscorea alata* (raja ala)

Traditional yams are now popularizing throughout country. From the traditional yams, *Raja Ala* (*Dioscorea alata*) has the more demand and cultivations are spreading. It has light purple color which preferred by the most of food processes and consumers.

In Sri Lanka, there are no any research conducted to evaluate the carbohydrate profile is very important factor when considering the bakery and other products which currently used wheat flour.

The objective of this research is to replace wheat flour with *Dioscorea alata* (*raja ala*) in flour and bakery industry of Sri Lanka. In here determine the carbohydrate profile and gluten content of *Dioscorea alata* (*raja ala*) Then plan to develop value added bakery products and find out the nutritional value of flour and value added bakery products.



Developed Rajaala flour

Raja ala flour was made by dehydration of yam in conventional air dryer and heat pump dryer. The quality of flour was superior in heat pump dryer compared to conventional dryer. Best dehydration temperature and time was 45 °C for 6 hours in heat pump dryer. Discoloration of raja ala flour can be controlled by treating with 0.5% citric acid solution for 2-3 minutes before drying. Development of value added products is in progress. Total allocation for the research (2021) was Rs. Mn. 0.02 and the expenditure was Rs. Mn. 0.019. Physical progress- 45%. Total financial allocation- Rs. Mn. 0.475. Project duration 3 years, 2021, 2022 and 2023.

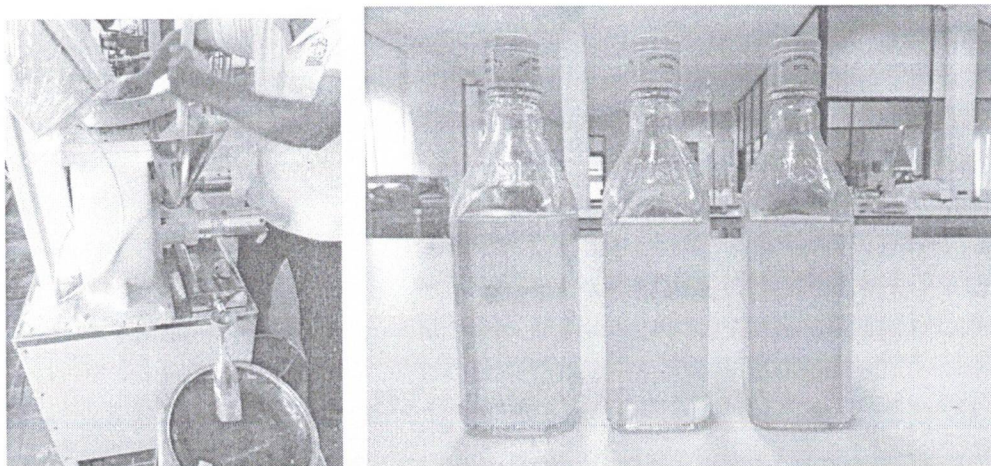
07. Survey on rice mills and other food grinding mills

Rice mills and others agro food grinding mills play a vital role to provide foods to nation and make a considerable impact in the national economic development of Sri Lanka. Even though the number rice mills and other agro food grinding mills in each districts is very much important in different expect for policy makers, development project conductors and for the relevant government bodies, there is no such proper data available with any government institutes so far. But these millers are registered in different government institutes since it is a requirement for operation and for their existence. Therefore, it is going to collect data from different institutes and make a data base on presently available rice mills and other agro food grinding mills under this project. Basically data are collected from the four major districts of rice processing Anuradhapura, Polonnaruwa, Ampare and Hambanthota. There are 60 AGA offices in these districts. During the year, data were collected from 25 AGA offices.

Total allocation for the research (2021) was Rs. Mn. 0.246 and the expenditure was Rs. Mn. 0.0192. Physical progress- 70%. Total financial allocation- Rs. Mn. 1.924. Project duration 2 years, 2021 and 2022.

08. Design and Development of a process line for groundnut oil extraction

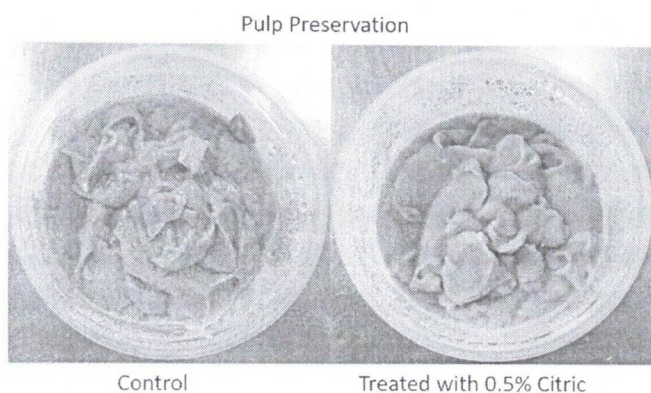
The groundnut (*Arachis hypogaea* L.) is one of the important oil seed crop in legume family and it is a good source of protein and fiber. Groundnut oil is often used as healthy edible oil in some countries around the world. The nutrients that can be found in groundnut oil include a low percentage of saturated fats, a high percentage of monounsaturated and polyunsaturated fat and also rich in essential vitamins and have good antioxidant properties. Therefore it can be used and introduced as an edible instead of coconut oil which is commonly used in Sri Lanka. Red Spanish, Tissa, Walawa, Indi, Tikiri, ANKG1 are the main varieties cultivated mainly in Moneragala, Kurunegala, Ampara, Badulla, Puttalam and Rathnapura districts in Sri Lanka. The annual production in Yala and Maha seasons is about 27,602 tons (AgStat 2018). Under the new manifesto, the government has recognized 16 important crops including groundnut that should have to be increased the cultivation. Therefore, it is expected that the annual production will be increased in the coming years. Hence, it will be more important to pay our attention on the developing post-harvest practices in terms of minimizing post-harvest losses and value addition of that harvested products as well. In this regard, introduction of oil extraction will be the main value addition product under groundnut cultivation and that can be introduced as a new major market opportunity. Therefore, through this research we are going to develop a process line for groundnut oil extraction from local groundnut varieties by determination of extraction efficiency, cost of production and capacity of the extraction process. At the end of the year 2021, oil extraction process has been optimized and further improvements with quality assessment were in progress. Total allocation for the research (2021) was Rs. Mn. 0.811 and the expenditure was Rs. Mn. 0.692. Physical progress- 88.8%. Total financial allocation- Rs. Mn. 1.075. Project duration 2 years, 2021 and 2022.



Oil extraction by Screw press oil expeller and Extracted groundnut oil samples

09. Development of a science based protocol for postharvest handling of Avocado

As perishables, fruits such as Avocado (*Persea americana* Mill.) shows shorter postharvest shelf life, high postharvest diseases and ripening related issues. Apart from that it is very rare to find avocado based locally produced value added products in the local market. Therefore, this experiment was designed to develop value added products from avocado, to find environment friendly methods (essential oils and plant extracts) to control postharvest diseases, to develop a harvesting tool and to develop effective ripening method for avocado. As the first step, optimum ethephon concentration and exposure time were found for proper ripening. This is a two year research starting from 2021 and the total budget allocation was Rs.Mn. 0.326 for the year 2021 and the total expenditure was Rs. Mn. 0.316. Physical progress-100%. Total financial allocation- Rs. Mn. 0.625. Project duration 2 years, 2021 and 2022.



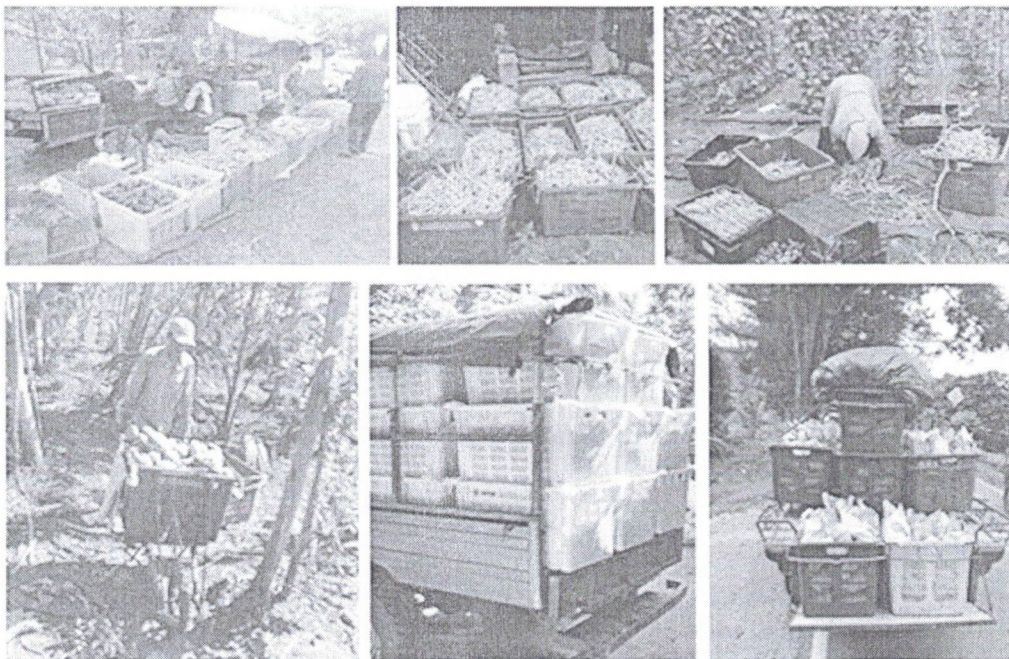
DEVELOPMENT PROJECTS

Development projects were carried out by the institute in order to ensure technology adoption and their impact on the postharvest industry with special emphasis on agribusiness development and assuring food security. During the year of 2021, nine development projects were conducted by the institute in the key areas of development of agro based industries in the country and the total financial allocation for the projects was Rs. Mn. 74.6. All these projects were planned as 2 year projects thus continued to 2022. Summary of the development projects are given in the following table.

	Project Title	Date of Commencement	Approved Budget (2021)	Financial Progress (as at 31.12.2021)		Physical Progress (%)
				Rs. Mn	%	
1.1	Introduction of safe packaging and transportation methods to reduce postharvest loss in perishable supply chain in Sri Lanka	01.01.2021	49.587	49.274	99.4	97.5
1.2	Developing a technologically sound regional distribution network for fruits and vegetables	01.01.2021	5.45	5.31	97.4	58
1.3	Development of cottage level rice processing industry	01.01.2021	4.274	4.2055	98.4	100
1.4	Establishment of pulse dehulling units in major pulses grown areas in Sri Lanka	01.01.2021	2.625	2.032	77.4	65.7
1.5	Development of on-farm storage facilities of rice maize and pulses to increase the farmers income	01.01.2021	1.78	1.747	98.1	100
1.5	Establishment of secondary processing centers to empower the stakeholders of fruit value chain in Sri Lanka.	01.01.2021	3.995	3.45	86.4	88.3
1.6	Introduction of Spice processing micro - enterprises in rural level	01.01.2021	1.13	1.053	93.2	100
1.7	Establishment of medium scale extrusion units for development of value added extruded products by using local yams,jack,maize,pumpkin and other food crops	01.01.2021	4.01	3.9196	97.7	76.2
1.8	Upgrading the laboratory facilities for strengthening the new product Development (NPD) procedures and product quality enhancement	01.01.2021	1.8	1.7766	98.7	51

1. Introduction of safe packaging and transportation methods to reduce postharvest loss in perishable supply chain in Sri Lanka

Serious quantitative post harvest losses and quality deterioration occur during all stages of the horticulture supply chain in Sri Lanka. The results of a surveys and studies conducted have revealed that the post harvest loss in fruits and vegetables range from 30-35% in which highest contribution is given during the transportation due use of unsuitable packaging. Therefore, this project was initiated to popularize the use of appropriate packaging for transportation of fruits and vegetables among farmers, collectors, transporters, whole sellers, retailers. One of the main activities of the project was awareness creation to improve the knowledge of stakeholders; farmers, collectors, wholesalers and retailers on improved postharvest technologies and their applications for fruits and vegetable supply chains in Sri Lanka. The project aimed to provide plastic crates to all the stakeholders of fruits and vegetables supply chain in the country on 70% subsidy basis. During year 2021, 31240 plastic crates under two categories were introduced to stakeholders in major perishables supply chains in Sri Lanka. Using these plastic crates approximately 500 MT of fruits and vegetables are being transported daily. Then, the postharvest losses of some fruits and vegetables have reduced remarkably from 30-40% to 15-20%. Total budget allocation was Rs.Mn. 49.587 for the year 2021 and the total expenditure was Rs. Mn. 49.274. Physical progress 100%.



Use of plastic crates in handling and transportation

2. Developing a Technologically Sound Regional Distribution Network

Improper distribution chain of vegetables and fruits is the main reason for higher price fluctuation and higher postharvest losses of perishables. Therefore, the project launched to develop a technologically sound regional distribution network for fruits and vegetables. It is also implemented to provide technologies and necessary facilities to improve the handling activities of fruits and vegetables to the beneficiaries of the project. These beneficiaries were selected based on their willingness to join the project and from the stakeholders who are in the current supply chain in the selected areas. With all factors being considered in the project covering all activities and stake holders of the supply chains of fruits and vegetables, loss reduction and high profits gained by entrepreneurs and making high quality produce products being available in the market will enable the project to be highly successful. This is a 3 year project starting from the year 2021. The budget allocation for the year 2021 was Rs. (Mn) 5.45 and total expenditure was Rs. (Mn) 5.303. As the initial step, the areas and the beneficiaries were identified who are farmers, transporters and retailers to precede the project as expected. . Physical progress 58%.

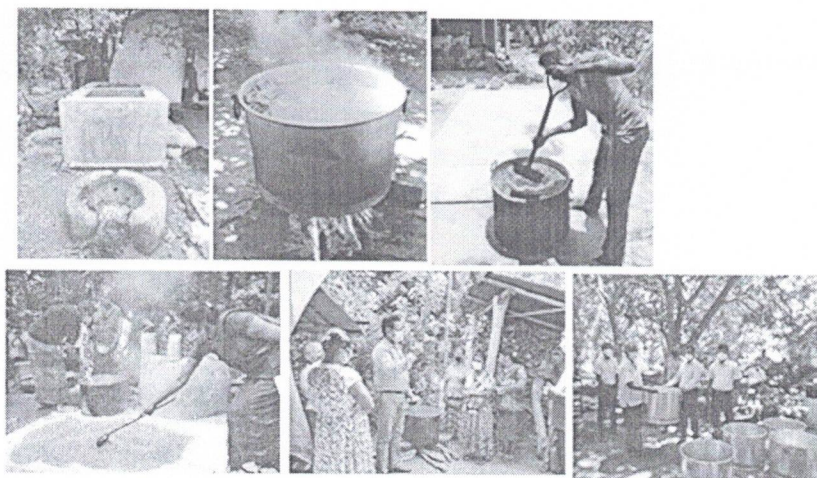
3. Development of cottage level rice processing industry

The existing supply chain of rice is that the farmer sells his paddy in the unprocessed form to a middleman and this paddy is usually processed into rice in a separate rice mill and be sold in the market. Therefore, many middlemen are involved in between farmers and consumers and it has caused increases in retail price of rice while the farm gate price decreases. This leads to reduction of farmers' income while the consumers pay more. Development of the rice industry at cottage level will initiate rice processing micro enterprises at farm level that lead farmers to increase the market value of their produce and thereby significantly increase their income and at the same time, create self-employment among the rural farming sector. The consumers will have high quality rice for reasonable prices.

The cottage level rice parboiling and processing methods developed by the National Institute of Post-Harvest Management (NIPHM) has overcome the drawbacks of conventional parboiling such as incomplete parboiling which results in a product with white bellies and poor milling qualities. Other advantage is that, this whole process can be done easily by the farm women by improving knowledge, skills and attitudes towards appropriate post-harvest technologies in rice process. So, they can process parboiled paddy into rice from the village level custom rice millers and will be able to sell them in the open market. Since the less cost of production (Low time consumption, low fuel consumption, low labor cost) and less middlemen involvement in this process will lead to provide high profit margin for the farmer. At the same time, they will be able to sell their high-quality rice for a reasonable price to a consumer.

The project proposed to introduce of improved parboiling techniques for the rural community and initiate rural level micro enterprises by creating awareness and conducting training programs on improved parboiling techniques and after selecting beneficiaries they

were provided with parboiling equipment and drying sheets (for sun drying process) free of charge. And also, two soaking tanks per beneficiary were constructed at 50% cost reimbursement basis. It was planned to establish 100 rice processing units in major paddy cultivation areas in the country and at the end of the year 2021, seventy seven (77) units were established as follows; 04 units at Kandy district, 03 units at Kegalle, 03 units at Matale, 25 units at Kurunegala, 03 units at Jaffna, 05 units at Kilinochchi, 01 unit at Vaunia, 01 unit at Mullaitivu and 32 units at Ampara district. The budget allocation for the year 2021 was Rs. (Mn) 4.274 and total expenditure was Rs. (Mn) 4.205. . Physical progress 100%.



Different stages of the project

4. Establishment of pulse de-hulling units in major pulses grown areas in Sri Lanka

Green gram, black gram cowpea and kollu are the major pulse grains in the Sri Lanka. And government has taken steps to increase production further to satisfy the country production to the demand. In Sri Lanka, pulses such as green gram, black gram and cowpea are cultivated under subsistence farming systems in the dry and intermediate rainfall zones. Kollu (Horse gram) is grown in Nuwara-Eliya district especially in Walapane Area.

Pulses are cultivated for their seeds. The seeds are used for human and animal consumption or for the production of oils for industrial uses. Pulses are consumed as Dal, which is a cheap source of plant protein. The high content of iron (Fe) and zinc (Zn) in pulses is specifically beneficial for women and children at the risk of anemia. Pulses are low in fat and rich in soluble fiber which can lower cholesterol and help control blood sugar. Processing of pulses is very much important to reduce or eliminate the anti-nutrient compound of them. De-hulling involves the removal of the hulls of grain seeds. De-hulling can be done traditionally with mortar and pestle, which makes the process laborious and time consuming. The de-hulling of legumes results in reduction of fiber and tannin content, and, most importantly, affects the appearance, texture, cooking quality, digestibility, and palatability of the grains. This has created an high market potential specially for green gram, black gram, pigeon pea, cowpea and Kollu etc..

NIPHM has developed a pulse de-hulling machine and it has a capacity of 200 kg/day. Therefore, this machine can be introduced to initiate pulse de-hulling industries in small/medium scale since an increased demand for the processed product, as aforesaid, is observed. So, the objective of this project was to Increase the availability of de-hulled pulse in the market through establishing 50 small/medium scale new pulse dehulling units in the country. It was planned to establish 15 pulse dehulling units in major pulse growing areas in the country and at the end of the year 2021, all the beneficiaries were identified and machineries were being fabricated in the workshop of NIPHM. After construction these machineries will be distributed to establish pulse processing units at, 02 units at Kurunegala, 01 unit at Kilinochchi, 02 units at Mullaitivu, 02 units at Vavunia, 04 units at Anuradhapura, 01 unit at Hambanthota and 03 units at Ampara district. The budget allocation for the year 2021 was Rs. (Mn) 2.625 and total expenditure was Rs. (Mn) 2.032. . Physical progress 65.7%.

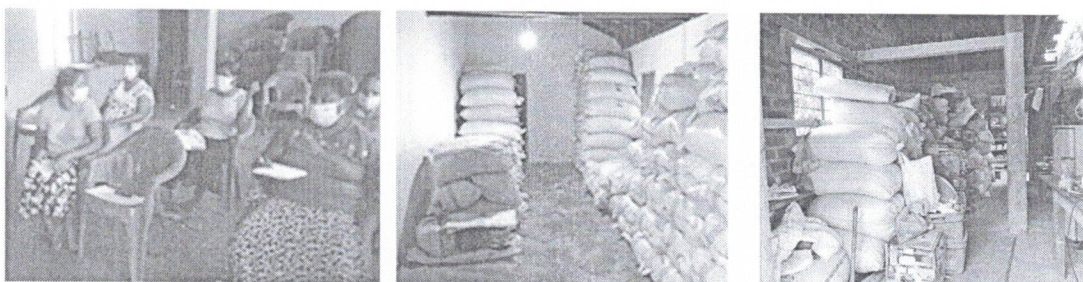


NIPHM developed Pulse dehulling machine, pulses before dehulling and after dehulling

5. Development of on-farm storage facilities of rice, maize and pulses to increase the farmers' income

When considering the paddy, maize and pulses industry, high cost of production and the low farm gate price during the harvesting seasons constrain the farmer by low income. Therefore, promoting on-farm storage was identified as a solution that minimizes direct sales and increases the profit margin to the farmer through off seasonal sales. Thus, this project was implemented to improve the condition of on-farm storage facilities and minimize quantitative and qualitative post-harvest losses of grains, and to safeguard the industry. Project was proposed as a three year activity where the first year was completed successfully. The project was executed in six districts namely; Ampara, Mullaitivu, Kurunegala, Kandy, Anuradhapura and Hambantota. Farmers who currently store grains in home scale were selected as beneficiaries where training programmes were conducted to

improve their knowledge on scientific way of grain storage. Among them farmers who were willing to improve the existing condition of their storage were selected and guided to renovate the grain storage scientifically and an allowance was given based on a pre-prepared standard estimate. Within the year 2021, seven training programmes were conducted and also some farmers were trained individual basis due to the prevailed pandemic situation. Further, allowances were provided for renovating 68 number of on-farm storages (at. Kandy-05 units, Kurunegala- 13 units, Kilinochchi- 01 unit, Vavunia-02 units, Mullaithivu-12 units, Ampara-31 units, Anuradhapura-02 units and Hambanthota-02 units) Budget allocation for the year 2021 was Rs. Mn,1.78 where Rs. Mn. 1.747 was spent. . Physical progress 100%.



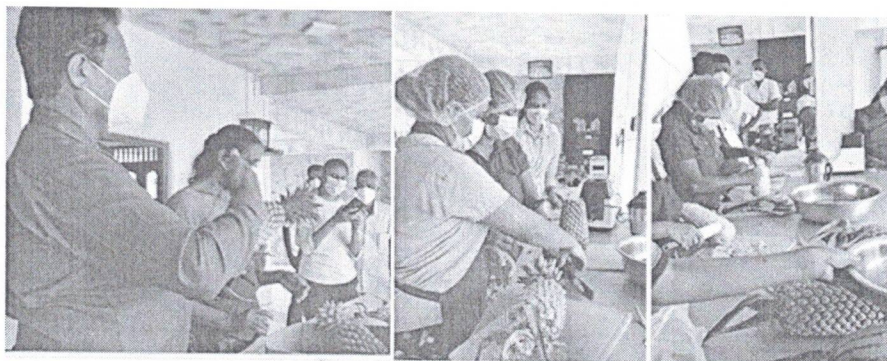
Conducting training programmes, onfarm storages before improvements and improved storage facilities

6. Establishment of Secondary processing centers to empower the stakeholders of fruit value chain in Sri Lanka

At present, one of the main national-level challenges is how to reduce post-harvest loss of perishables. Lack of proper value addition related knowledge and technologies is also the main barrier to developing the fruit processing sector of the country to cater for the demand of the international market and thereby increase the availability of fruit-based products all over the world. Usage of food preservation methods (processed and value-added products) is one of the options to reduce the postharvest losses of fruits. The most common and popular methods of preservation of fruits are pulping and dehydration which will lead to extending the shelf life.

Through this project, it was planned to provide the initial support for the target beneficiaries by establishing three pulping centres and two dehydration (fruit processing) centres to initiate the dehydration and pulp production line which can be used for value addition practices of fruits in off seasons in Anuradhapura, Mathara, Kurunegala, Monaragala and Kegalle districts. Beneficiaries were trained on selected two technologies via training programmes. The main criteria in the selection of these beneficiaries were whether they are already involved or willing in participating in selected activities or when selecting, the requests done by beneficiary societies were considered. The project proposed to provide the relevant machinery and equipment to the beneficiaries under the ownership of NIPHM while signing an agreement with them to assure proper usage of the facilities provided. After two years of supervision and based on proper implementation of the project activities by the

beneficiaries, the ownership of the machinery and equipment will be handed over to the beneficiary. The output of this project is the availability of pulping and dehydration centres for the beneficiaries who wish to engage in businesses related to value addition and the outcome is the reduction of post-harvest loss of fruits by introducing value addition techniques like pulping and dehydration. But even at the end of the year pulping machines were not delivered by the suppliers due to the prevailing financial crisis of the country. Therefore the pulping units were not established although establishment of dehydration units is in progress.. The financial allocation for this project is Rs Mn. 3.995 and the total expense is Rs. Mn 3.45. . Physical progress 88.3%.

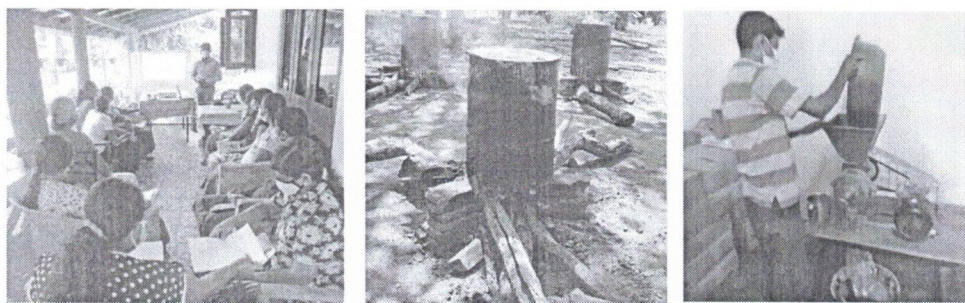


Conducting training programmes on value addition

7. Introduction of Spice Processing micro-enterprises in rural level

Spices play an important role in enhancing the flavour and taste of the processed foods. Ground spices are extensively used in all types of curried dishes in Sri Lanka and abroad. Although spices are traded chiefly in an unprocessed form, a small yet significant quantity enters international trade as spice powders. Curry powder is the foremost of those blends or mixes and sometimes consists of 20 or more spices designed to add the characteristic flavour of a Sri Lankan curry, which is appreciated all over the world. Hence the demand for unadulterated spices and curry powder in attractive packaging is fast emerging. Moreover, current regulations on restricting importations of whole spices have increased spice farming in the country. Consequently, the market for processing spices has enormous potential.

In this context, this project was initiated with the objective of promoting spice processing in the country, thereby small / medium entrepreneurs, farmers and unemployed youth are made aware on establishing agro processing industries to increase their income levels through value addition. In the year 2021, the NIPHM was able to establish 15 spice processing units all over the country (Kandy- 02 units, Kurunegala- 02 units, Mullaithivu-01 unit, Ampara-03 units, Anuradhapura-04 units, Kegalle-01 unit, Hambanthota-01 unit, Kilinochchi-01 unit). Beneficiaries of the project were well trained on spice processing before providing the machineries in 50% subsidized basis. Total estimated cost of the project was Rs. Mn. 1.13 and the expenditure was Rs. Mn. 1.053. . Physical progress 100%.



8. Establishment of medium scale extrusion units for development of value added extruded products by using local yams, jack, maize, pumpkin and other food crops

Nowadays extruded products are well popular among young generation. So there is a necessity of introducing more nutritious food items in ready to eat forms. Thus, considering availability, popularity and nourishment, value added products can be developed through the extrusion process by using yams, jack, maize, pumpkin and other food crops that well grown in Sri Lanka. Extruded product can be used as value added products for the seasonal crops and crops with higher price fluctuation. Utilization of excess production in the season can reduce the post-harvest loss and also increase the food product diversification in the market. Extrusion processing center will be established in National Institute of Post-Harvest Management. Major crop cultivation areas of selected crops with surplus production will be selected and conduct training and technology transfer programs for the entrepreneurs who wish to engage in food processing industry and entrepreneurs who are already engaged in extrusion food industry. The project proposes introduction of novel extrusion techniques for the medium scale enterprises. 100 no of farmers who grow yams, jack, maize, pumpkin and other local food commodities will be selected to supply raw materials for the extruded snack production.

The extrusion unit is mainly equipped with flour mixer, twin type double screw extruder machine and flavoring machine. Gas filling automatic band sealer, batch/date coder machine, electric scale and other utensils were ordered as other supporting items. All machineries and equipment were ordered but delayed due to covid-19 situation and economic status of the country.

Total estimated cost of the project was Rs. Mn. 4.01 and the expenditure was Rs. Mn. 3.9196. Physical progress 76.2%.

9. Upgrading the Laboratory Facilities for strengthening the New Product Development (NPD) procedures and Product Quality Enhancement

NIPHM is mainly undergoing activities in terms of research and development, technology transferring and providing laboratory services for outside parties such as university students, other public and private institutions, etc. As an institution that is shouldering for national responsibilities, NIPHM is much strong in empowering the entrepreneurs with preciously established concepts and methodologies through research and development activities in value addition to agricultural commodities as it can be identified as a national priority in order to find a feasible solution for Postharvest losses. Gaps in laboratory facilities directly affect the quality of the laboratory works as well as the assistance and support given to the outside parties. Apart from that, there are limited numbers of food products quality testing facilities available in Sri Lanka and those places are not affordable for small and medium scale entrepreneurs. Hence, this project was planned to equip the laboratories of the NIPHM in order to become a government body that can facilitate those tests at affordable rates for the benefit of small and medium scale industries in their product quality testing. This is a two-year project and during the first year we were able to purchase a stomacher blender and an anaerobic incubator to strengthen the capacities of our laboratories and there are a few more to be purchased in the coming year. With the new additions to the laboratories, the value addition of food commodities will be widening to many avenues which can reach up to the growing market need. The total budget allocated for this project for the year 2021 was Rs. Mn. 1.8 and the expenditure for the first year was Rs.Mn.1.78.

TECHNOLOGY TRANSFER ACTIVITIES

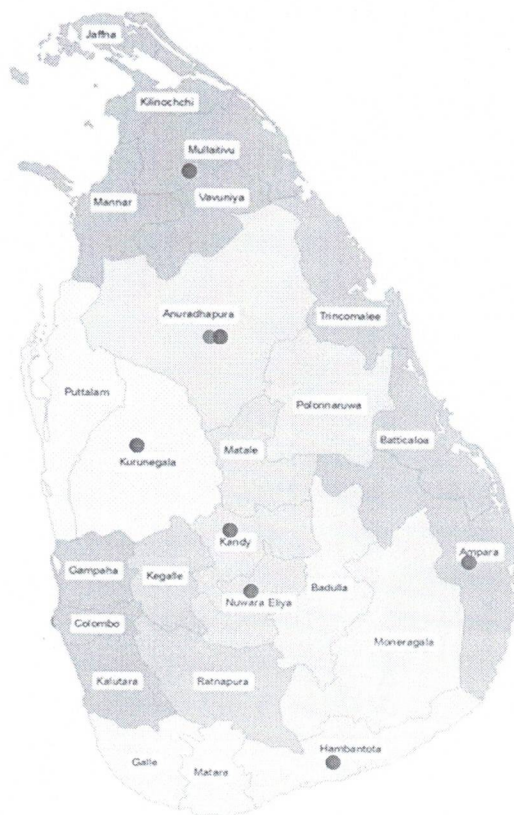
Extension division carries out its technology dissemination activities through its island wide extension Centers in liaisons with government and non-government organizations. Technology dissemination through field level extension work, which is one of the major activities of the institute, was continued during the year 2021.

Main different Sectors Selected for Technology Transfer activities.

- a) Minimization of postharvest losses in agricultural crops
- b) Introducing technologies for storage methods
- c) Processing of rice, pulses and other grains
- d) Spice processing
- e) Value addition for fruits and vegetables
- f) Rice and pulse based product development
- g) Awareness programs on human nutrition and food habits in Sri Lanka

The island wide extension network consists of eight field Centers located in the following major crop producing areas:

1. Anuradhapura (covering Anuradhapura, Polonnaruwa, Trincomalee)
2. Ambanpola (covering Kurunegala, Puttalam)
3. Kandy (covering Kandy, Matale, Kagalle)
4. Nuwara Eliya (covering NuwaraEliya, Welimada and Badulla)
5. Ampara (covering Ampara, Monaragala, part of Batticallo, Mahawelli System C)
6. Hambantota (covering Hambantota, Matara, Galle, Ambilipitiya)
7. Kilinochchi (covering Kilinochchi, Vavuniya, Mulathiv, Jaffna, Mannar)
8. Colombo (covering Colombo, Gampaha, Kaluthara)



Currently island wide technology transfer activities are covered by 8 extension centers

TRAINING

Training programs were conducted with the aim of improving supply and value chains of agricultural commodities, ultimately to reduce the postharvest losses. These programs were conducted under following two strategies;

- Residential training programs
- Non-residential programs

Programs conducting at the institute are referred to as residential training programs and the programs conducted in the field are considered as non-residential training programs. All these programs are based on stakeholder requirement and were organized to cater to the training need of the beneficiaries.

Residential Training Programs

These training programs were conducted at Research and Development Center in Anuradhapura. Beneficiaries of the training programmes were mainly farmers/farm women, collectors, transporters, whole sellers, retailers/traders and processors. Further these programs were also conducted under training of trainer aspect for officers of government and non-governmental organizations, students of universities, technical colleges and schools.

These programs were aimed towards awareness creation on postharvest technology, entrepreneur development, loss reduction, process and product quality improvement, etc.

During the year 2021, 10 short-term residential training programmes were conducted and 448 people were trained in various disciplines of post-harvest technology. The following table contains the details. The majority of the residential programs had to be canceled in accordance with the COVID-pandemic health regulations.

Group	Description	No.of Programs	No.of trainees
A	Awareness creation programmes on postharvest technologies for Farmers/farm women and members of farmer organizations	02	47
B	Programmes on food processing and value addition for the small/medium scale entrepreneurs	05	81
C	1. Students from Secondary schools, Universities, Schools of Agriculture and Technical Colleges (Including students for industrial training)	01	276
	2. (Including students for industrial training)		14
D	Training programmes for Individual requests	02	30
Total		10	448

Non-residential/ Field training programs

These programs are conducted in the field itself. These are conducted by the R&D center in Anuradhapura and the extension centers of NIPHM. During the year 2021, 65 field training programs and demonstrations were conducted and 1004 individuals were trained.

For the stakeholders in the supply and value chains of agricultural produce, such as farmers and farmwomen, collectors, transporters, whole sellers, retailers/traders, and processors, training programs were conducted with the goal of raising awareness about postharvest technology, entrepreneur development, loss reduction, process and product quality improvement, etc.

Many of these beneficiaries are using the technologies given in these training programs. Through the technical knowledge attained, knowledge improvement, quality enhancement of produce, income generation, rural empowerment, and many other benefits were achieved. This directly contributes to the loss reduction and quality improvement of the local produce in the agriculture sector, which is one of the main limiting factors in national development in line with food security.

Group	Description	No. of Programs	No. of trainees
A	Development projects related training programs	51	831
B	Training programs conducted, based on the field request	14	173
Total		65	1004

Further these training of stake holders had contributed to industrial development, economic development and social development with improved living standards as well. Thus, 102 new entrepreneurs were introduced to the agro based industries and these industries include 18 brands of spice based products, 43 brands of rice based products, 05 brands of dehydrated fruit products, 32 brands of fruit based products and 04 pulse based producers.



Technology adoption in the field

CONSULTANCY SERVICES

National Institute of Post Harvest Management (NIPHM) provides consultancy and other services to public, private and cooperative sector organizations that are either directly or indirectly involved in the post-harvest industry. Through this, services are given to establish new processing plants, modernizing of existing mills and plants and to solve technological problems encountered by rice millers and other food processors in their day-to-day operations. In the year 2021, NIPHM helped to prepare technical reports, feasibility reports and special reports for different agro food processing industries as per their request. Institute supported the stakeholders by providing laboratory and engineering services especially for the quality control activities both in industrial products and process lines. Laboratory services consisted with chemical, physical and microbiological services whereas engineering services included machinery and equipment testing and evaluation, and operator training. In the year 2021, the institute was able to provide 21 consultancies for the postharvest industry island wide.

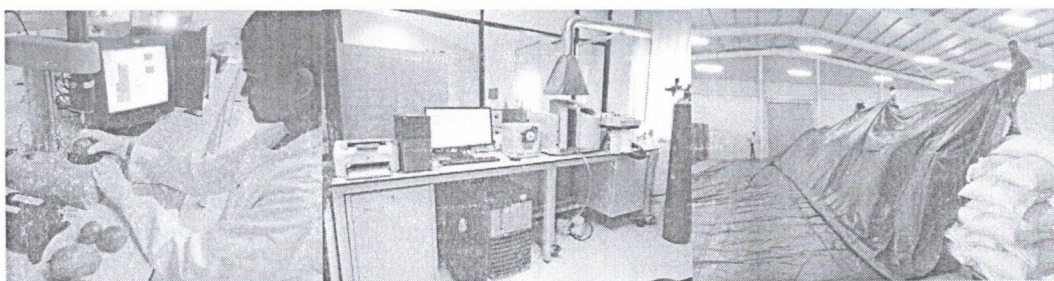
Summarized details of consultancies are listed below.

No	Name of the Customers	Services
01	Mahindarathna Rice Mill, Thambuththegama	Project report to establish a waste water treatment plant in rice mills
02	M.A.R.S.Ananda, Kirindiwela	Consultancy service on rice milling
03	Darshana Galappaththi, Ragama	Dehulling of Black gram- Sample testing
04	Upul Kumara	Dehulling of Black gram
05	Sriyan Edirisighe, Welikanda	Consultancy service on rice milling
06	Manager, Cooperative Wholesale Establishment	Participating to TEC and providing Technical Evaluation report for Hingurakgoda rice mill
07	S.M.J.M.Kumara	Providing pulse dehulling machine
08	Manager, Multi-service Co-operative Society Ltd, Hingurakgoda	Inspection of rice mills
09	J.P.I.Kamalsiri, Kanthale	Inspection of the rice mill.
10	Director, Food Promotion Board	Participating to the Technical Evaluation committee of the valuation and destroying some items in Kalankuttiya food processing unit
11	Manager, Multi-service Co-operative Society Ltd, Pemaduwa, Wilachchiya	Modernization of the Rice processing unit and submission of the project report on Lime processing
12	N. Harsha Jayantha, SAFE Foundation	Providing specifications for chilli processing
13	Aruna Rupasinghe, Agriculture Sector, Modernization Project	Inspection of rice mills
14	Priyamani Hemachandra	Consultancy on preparation of Mango based products and moringa powder
15	Thiekshana Nayanthara, Ampara	Providing technical report on fruit and vegetable dehydration
16	Manager, Multi-service Co-operative Society Ltd, Kobeigane	Inspection of rice the mill
17	Innovation of Machineries programme of the Ministry of Agriculture	Inspection of machineries of Mr.J.K.W.S Jayasundara
18	'Innovation of Machineries' programme of the Ministry of Agriculture	Inspection of machineries at Batticalo
19	Ceylon first exporters Pvt Ltd., Thambuththegama	Technical advises for Bottling of fruit and vegetables
20	R.D.V.J. Rajapakse, Horana Rd., Handapangoda	Project report on food dehydration
21	Department of Agriculture	Technical support to provide/establish 50 chilli dryers in different places of the country

Laboratory Services

The Institute played an important role in exercising quality control of agro/food products in the country by analyzing samples received from both private and public sector organizations for their physical, chemical and microbiological quality. NIPHM is equipped with well-developed laboratory facilities; especially the chemical laboratory is equipped with Atomic absorption spectrophotometer, Gas chromatography and high performance liquid chromatography, Gas chromatography Mass spectrometer etc. and the newly renovated Microbiology laboratory is equipped with Biosafety cabinet, autoclaves, incubators, ovens, light microscopes and image processing microscope etc.

Using these facilities, NIPHM has commenced to outsource the laboratory facilities and also taking accreditation for some of its laboratory analyses. Fumigation of grain warehouses is another promising facility given through laboratory services to the stake holders. During the year 2021, 351 laboratory reports were issued to the stakeholders after analysing their food samples. Further, 5 fumigations were conducted.



Laboratory facilities

CAPACITY BUILDING AND PRODUCTIVITY DEVELOPMENT

Institute takes a keen interest to enhance the knowledge of its employees. The following officers of the Institute underwent postgraduate study and training in the fields pertaining to Post Harvest Technology during the year 2021.

Postgraduate Degree Programmes

Completed Programmes

Mr. B.A.M.S.Kumara
M.Sc. in Horticulture
Post Graduate Institute of Agriculture (PGIA)
University of Peradeniya

Mrs.R.M.R.N. K. Rathnayake
Ph.D. in Postharvest Technology
Post Graduate Institute of Science (PGIS)
University of Peradeniya

Eng. (Mrs.) D.M.S.P. Bandara
Ph.D. in Bio System Engineering
Post Graduate Institute of Agriculture (PGIA)
University of Peradeniya

Continued programmes

Mr. W.M.C.B. Wasala
Ph.D. in Postharvest Technology
Post Graduate Institute of Agriculture (PGIA)
University of Peradeniya

Eng. (Mr.) B.D.M.P. Bandara
Ph.D. in Bio System Engineering
Post Graduate Institute of Agriculture (PGIA),
University of Peradeniya

Mrs. C.K.Marasinghe
Ph.D. in Engineering
Center for Engineering Research and Postgraduate Studies
Faculty of Engineering, University of Peradeniya

Miss. S.S.K.Weerasinghe
M.Sc. in Horticulture
Post Graduate Institute of Agriculture (PGIA)
University of Peradeniya

Mrs. W.B.W.M.R.C.P. Aluvihare
M.Sc. in Horticulture
Post Graduate Institute of Agriculture (PGIA)
University of Peradeniya

Short term training/ Meetings/Conferences

Research and development staff participated in training programs/workshops conducted on a virtual platform since they were unable to attend overseas trainings under the COVID pandemic situation. Details are listed below.

Name of the programme	No. of participnat	Duration of the programmes
Internal auditing on quality management systems of laboratories	02	02 days
Identification of standards related to laboratory quality control	03	3 hours
Quality control of microbiology laboratories	03	2 hours
Assessment of unsertanity in laboratory measurements	03	2 days
Assessment of unsertanity in microbiological readings	03	2 days
Calibration certification for sample testing laboratories	03	3 hours
Training programme on Microbiology	03	2 hours
Identification of control samples for sample testing laboratories	03	1 day
Waste Management in a Laboratory	2	1 days
Value addition for underutilised crops	03	03 hours
Food packaging	16	02 days
Value addition for fruits and vegetables and novel trends in postharvest technologies	12	1.5 hours
Awareness of how to win your career	16	2 hours
International Training Program on “Innovative Marketing Models for Small Scale entrepreneurs”	1	5 days

AWARDS AND RECOGNITIONS

Eng. H.M.A.P. Rathnayake

- Member of Faculty Board, Faculty of Agriculture, Rajarata University of Sri Lanka
- Member of Board of study of Master of agriculture degree programme, Rajarata University of Sri Lanka

Dr. Nilanthi Wijewardana

- Steering Committee Member of the Sri Lanka Association for Advancement of Sciences (SLAAS), Sri Lanka
- Member of the working committee of the Sri Lanka Standard Institution for Formulation of standards for papaya
- Chairman, environmental committee of SLAAS
- Consultation on Agriculture and Livestock Sector for Review and Update of Nationally Determined Contributions (NDCs) of the Climate Change Secretariat of the Ministry of Environment, Sri Lanka.

Mr.W.M.C.B.Wasala

- Member, National Committee in Postharvest Technology coordinated by Sri Lanka Council for Agriculture Research Policy
- Member, Working Group for Storage of Paddy and Rice, Sri Lanka Standard Institute

Dr. R.M.R.N.K. Ratnayake

- Secretary, Sri Lanka association for mycology and plant pathology

PUBLICATIONS

- Aluwihare, W.B.W.M.R.C.P., Wijewardana R.M.N.A. (2021) Development of ready to use formulation for enhance the shelf life and quality of cut flowers, paper presented in National Symposium on Floriculture Research (NaSFLOr) on 16th December 2021 via zoom
- De Zoysa, P.N.T., H.P.S., Senarath, and Wijewardhana, R.M.N.A.. Utilization of Embul Banana (*Musa spp.*) Variety for Preparation of Flour as a Food Ingredient. (2021). Proceedings of Peradeniya University International Research Sessions 2021, Sri Lanka, Vol. 23, 11th & 12th November 2021.
- Gunawardane, E., Ratnayake, R.M.R.N. Jayathunga, K.G.L.R. and Illeperuma, C.K. (2021), Impact of pre-harvest soil application of rice husk ash on post-harvest quality of green chili (*Capsicum annuum* L.). Proceedings of the international conference on innovation and immerging technologies. 25-26 November 2021, University of Sri Jayawardanapura, Sri Lanka.
- Herath, H.M.B.H., Bandara, D.M.S.P., Weerasooriya, G.V.T.V., Kosgollegedara, E.J. Karthigayini, S., Wijethunga, G.A.M.A.. and Marasinghe, C.K. (2021), Performance Evaluation of a Power Operated Groundnut Decorticator. Proceedings of the National Engineering Research Symposium (NERS_2021)
- Hettige K.D.T. Development of soursop incorporated probiotic frozen yogurt fermented by *Lactobacillus acidophilus*. (2021). Publication on 5th International Research Conference, Uwa Wellassa University 2021

- Jayarathne, G.E.D.A.M, Navarathne, S.B., Wickramasinghe, I. (2021). Improvement of lycopene content in locally available tomatoes by adapting post harvest storage practices. Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka;
- Jayasinghe, J.A.S.T., Kumara, B.A.M.S. and Jayathunge, K.G.L.R.. (2021). Optimization of Ethylene Concentration and Exposure Time to Enhance the Ripening Rate of Avocado Fruits. Proceedings of the 7th International Conference on Dry Zone Agriculture, 3rd and 4th December 2021, Faculty of Agriculture, University of Jaffna, Kilinochchi, Sri Lanka
- Kumara, B.A.M.S., Wijewardane, R.M.N.A. and Samarasinghe, Y.M.P. (2021). Evaluation of the effectiveness of freeze drying and vacuum packing technology for preservation of fresh fruits – (Papaya, Guava, Pineapple). Journal of Agricultural Sciences – University of Sabaragamuwa Sri Lanka
- Kumara, B.A.M.S., Menike, G.D.N. and Samarasinghe, Y.M.P. (2021). Quality improvement of fresh leafy vegetables by controlling undesirable postharvest physiological activities International Conference on dry zone agriculture – University of Jaffna Sri Lanka
- Kumara, B.A.M.S., Wijewardane, R.M.N.A. and Samarasinghe, Y.M.P. (2021). The Effect of Anti-Browning Treatments for Fresh-Cut Guava Slices in Prevention of Browning during Dehydration. *Journal of Agricultural Sciences - Sri Lanka*. 16(1):28-36. <http://doi.org/10.4038/jas.v16i1.9181>
- Kumara, B.A.M.S., Menike, G.D.N. and Samarasinghe, Y.M.P. (2021). Modified Atmospheric Packaging (MAP) Extends the Postharvest Life of *Sesbania grandiflora* (L.) Pers Fresh Leaves. Proceedings of the 7th International Conference on Dry Zone Agriculture, 3rd and 4th December 2021, Faculty of Agriculture, University of Jaffna, Kilinochchi, Sri Lanka
- Lionel, U.P.L.M., Wijewardana, R.M.N.A., Arachchi, M.P.M. and N.E. Wedamulla.(2021) Development and Quality Evaluation of Avocado (*Persea americana*) Based Nutritious Supplement Food. 5 th International Research Conference of Uva Wellassa University, IRCUWU2021 “Exploring Potentials in Challenging Periods” 1 st - 2 nd July 2021@ Uva Wellassa University, Badulla, Sri Lanka. Paper ID: IRCUWU2021-488
- Wijewardane, R.M.N.A., . Jayaweera, J.A.S. and Prera, G.A.A.R.. (2021). Formulation and quality valuation of fruit and vegetable based energy drink. International Conference on Applied and pure Science 2021, Faculty of Science, University of Kalaniya, Sri Lanka

2021 patent application

Name: G.E.D.A.M. Jayarathna

Topic: Development of a food additive to preserve food by incorporating of oil extractions of nutmeg (*Myristica sp.*) and cinnamon (*Cinnamon zeylanicum*)

Applied on: 31.07.2020 (still processing)

SOCIAL, WELFARE AND RELIGIOUS ACTIVITIES

The institute was unable to conduct social, welfare and religious activities due to Covid 19 pandemic in 2021.

HUMAN RESOURCES

The total permanent staff of the Institute was 155. Filled cadre positions as at end of December 2020 was 118. This total comprised of 52% in the technical divisions and 48% in the supporting divisions.

As at 31st December 2021

Position	Total Cadre Positions	Filled Cadre Positions
Higher Management Positions		
Director	01	-
Additional .Director (Administration & Finance)	01	01
Additional Director (Research & technology Transfer)	01	01
Total	03	02
Research & Development Staff		
Principal/ Chief Mechanical Engineer	01	01
Principal Research Officer	02	02
Principal Extension Officer	01	-
Senior Research Officer	03	02
Senior Mechanical Engineer	02	02
Senior Extension Officer	01	-
Research Officer	14	11
Mechanical Engineer	06	03
Extension Officer	05	05
Economist	01	01
Total	36	27

Supportive staff

Staff	Total Cadre Positions	Filled Cadre Positions
Internal Auditor / Senior Internal Auditor	01	01
Accountant / Senior Accountant	01	01
Technological Officer (lab)	01	01
Administration Officer	02	02

Librarian/ Publication Officer	01	01
Extension Assistant	10	10
Draughtsman	01	01
Technical Assistant	03	02
Technical Assistant (Civil)	01	01
Management Assistant (cashier)	01	01
Management Assistant	27	26
Laboratory Assistant.	04	02
Equipment Operator	02	01
Driver	13	12
Electrician	01	-
Welder/ Forman	01	01
Mechanic / Technician	02	02
Mill / Machine Operator	03	03
Boiler Operator	02	-
Cook	01	01
Office Aide	18	20
Boiler Assistant	01	01
Labourer (Sanitary)	03	03
Labourer (Canteen)	02	02
Security Guard	06	06
Maintenance Helper	08	08
Total	116	109

Expertise areas of Research and Development staff

In the area of post-harvest technology, the institute has good expertise in rice processing, grain storage and considerable expertise in fruit and vegetable, spice. The research and technology staff consists of engineers, agriculturists, chemist, microbiologists, food scientists etc. This help to analyses problems in different areas.

Distribution of Research and Development staff

No.	Area	Male	Female	Total
01	Agriculture	07	11	18
02	Engineering	03	03	06
03	Science	01	01	02
04	Food Science	-	01	01
05	Total	11	16	27

EXECUTIVE STAFFAs at 31st December 2021**DIRECTOR/CHIEF EXECUTIVE OFFICER (Acting)**

Eng. H.M.A.P. Rathnayake
BSc. Eng, MEng. CEng.MIE (SL)

ADDITIONAL DIRECTOR (RESEARCH AND TECHNOLOGY TRANSFER)

Eng. H.M.A.P. Rathnayake
BSc. Eng, MEng. CEng.MIE (SL)

ADDITIONAL DIRECTOR (ADMINISTRATION AND FINANCE)

Mr. R.K.A.P. Ramanayake
BSc. Mgt. Licentiate Certificate, ICA, MIPFDA

RESEARCH DIVISION**HOD | Principal Research Officer**

Dr. (Mrs.) Nilanthi Wijewardana
BSc. Agric, MSc. Agric, MPhil, PhD

Research Officers

Mrs. Y.M.P. Samarasinghe
B.Sc. Agric. MSc in Geo Informatics

Mr. B. A. M. S. Kumara
B.Sc. Agric. M.Sc.(Organizational Management)

Miss. T. M.A. N. Weerasinghe
B.Sc. in Export Agriculture (special), M.Sc. in Food Science & Technology

Miss G. E. D. A. M. Jayarathna
B.Sc. Food Science & Tech. (special), M.Sc. in Food Science and Nutrition

Miss W. M. S. S. K. Weerasinghe
B.Sc. Agric. M.Sc. in Organizational Management

Mrs. W. B. W. M.R. C. P. Aluwihare
B.Sc. Agric. MSc in Horticulture (Reading)

Mr K. D. T. Hettige
B.Sc. Agric., M.Sc. in Food and Nutrition

Mrs G. D. N. Menike
B.Sc. Agric. M.Phil. in Molecular and Applied Microbiology(Plant Protection)

ENGINEERING DIVISION

HOD | Senior Mechanical Engineer (Acting)

Eng. B.D.M.P. Bandara
BSc. Eng, MEng. CEng. MIE (SL)

Chief Mechanical Engineer

Mrs. D. P. Senanayake
BSc. Eng, MPhil. CEng. MIE (SL)

Mechanical Engineers

Mrs. C. K. Marasinghe
B.Sc. Eng., M.Phil.(Eng.), AMIE (SL), Ph.D.(Reading)

Mr. V.G.K.Maduranga
B.Sc. Eng.

EXTENSION DIVISION

HOD | Senior Research Officer

Mr. W.M.C.B.Wasala
BSc. Agric, MSc. Agric, MPhil.

Extension Officer

Mr. P.G. Lalith Wasantha
B.Sc. Agric., MSc Agric.

Mr. M.M. Herath
*B.Sc Agric., Dip. in Counseling
 Ph.D.(Reading)*

Mr. N. Somakanthan
B.Sc Agric., MSc Agric.

Ms. Lakmini Senavirathne
B.Sc Agric.,

PROJECT MANAGEMENT DIVISION

HOD | Senior Research Officer
 Mr. W.M.C.B. Wasala
BSc. Agric, MSc. Agric, MPhil. Ph.D. (Reading)

LABORATORY SERVICE DIVISION

HOD | Senior Research Officer (Acting)
 Mr. Chaminda Gunawardhane
BSc (Chemistry) special.

Technological Officer
 Mr. Champika Kumara
NCT (Electrical)

PLANNING AND MONITORING DIVISION

HOD | Senior Research Officer
 Dr. (Mrs.) Ruwanka Rathnayake
BSc.Sp. (Botany), MSc., PhD (Reading)

Economist
 Ms. K.A.T.S. Kumari
BSc. Agric, MSc (Reading)

ADMINISTRATION DIVISION

HOD | Additional Director (Admin & Finance)
 Mr. R.K.A.P. Ramanayake
BSc. Mgt.Licentiate Certificate, ICA, MIPFDA

Administrative Officer
 Mr. Janaka Subasinghe
BSc.

Administrative Officer
 Mrs. D.N. Munasinghe

FINANCE DIVISION

HOD | Accountant

Mr. I.M.N.P. Illangasinghe
B.Com (Sp.), APFA, ACPM, MBA (Reading)

ACADEMIC DIVISION

Senior Mechanical Engineer (Acting)

Dr. (Mrs). D.M.S.P.Bandara
BSc. Eng, MPhil. CEng.MIE (SL) Ph.D. (Reading)

INTERNAL AUDIT Division

HOD | Internal Auditor

Mr. R.M.D.Rathnayake
BSc (Accounting)

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED
31ST DECEMBER, 2021

		2021	2020
	NOTES	RS.	RS.
REVENUE			
General Treasury Fund - Recurrent	6	125,035,378.13	114,547,000.00
Transfers from other agencies	7	44,696,747.14	64,663,686.89
Amortization of Capital Grants	8	30,123,943.36	28,091,119.27
Self Generated Income	9	3,621,980.33	4,488,107.96
Other Income	10	4,058,156.03	3,564,412.48
TOTAL REVENUE		207,536,204.99	215,354,326.60
EXPENSES			
Wages, salaries and employee benefits	11	94,067,518.11	94,820,653.63
Supplies and consumables used	12	14,425,984.46	9,676,817.39
Depreciation and amortization expenses	13	44,655,476.02	37,761,161.39
Other expenses	14	11,245,445.60	13,134,397.54
Project Expenses	15	45,366,229.59	64,663,686.89
Finance costs	16	27,520.00	16,950.00
TOTAL EXPENSES		209,788,173.78	220,073,666.84
SURPLUS / (DEFICIT) FOR THE PERIOD		(2,251,968.79)	(4,719,340.24)

The accounting policies and notes from page 05 To 22 an integral part of these Financial Statements.


NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
STATEMENT OF FINANCIAL POSITION AS AT 31ST DECEMBER, 2021

	NOTES	2021 RS.	2020 RS.
ASSETS			
NON - CURRENT ASSETS			
Property, Plant and Equipment	17	271,581,026.34	191,950,823.36
Investments	18	20,000,000.00	20,000,000.00
Other non-current assets	19	14,663,482.14	14,441,123.42
TOTAL NON CURRENT ASSETS		306,244,508.48	226,391,946.78
CURRENT ASSETS			
Cash and cash equivalents	20	37,603,650.50	30,842,892.58
Receivables	21	2,213,426.65	11,004,053.98
Inventories	22	27,303,398.25	4,863,366.55
Advances	23	105,695.50	183,945.50
Other current assets	24	192,000.00	5,675.00
TOTAL CURRENT ASSETS		67,418,170.90	46,899,933.61
TOTAL ASSETS		373,662,679.38	273,291,880.39
EQUITY AND LIABILITIES			
EQUITY	25		
Initiate Capital		69,907,594.42	69,907,594.42
General Capital Fund		70,083,506.65	96,136,703.14
Assets Revaluation Surplus - Vehicle		34,702,988.00	34,702,988.00
Assets Revaluation Surplus - Plant & Machinery		11,316,204.17	11,316,204.17
Assets Revaluation Surplus - Computer		938,717.46	938,717.46
Assets Revaluation Surplus - Office Furniture		2,175,824.67	2,175,824.67
Assets Revaluation Surplus - Building		118,184,856.80	
Accumulated Surplus / (Deficit)		(13,488,369.32)	(13,291,772.25)
TOTAL EQUITY		293,821,322.85	201,886,259.61
LIABILITIES			
NON-CURRENT LIABILITIES			
Provision for Gratuity Fund	26	40,245,992.00	37,976,744.50
TOTAL NON-CURRENT LIABILITIES		40,245,992.00	37,976,744.50
CURRENT LIABILITIES			
Payables	27	39,595,364.53	33,428,876.28
TOTAL CURRENT LIABILITIES		39,595,364.53	33,428,876.28
TOTAL LIABILITIES		79,841,356.53	71,405,620.78
TOTAL EQUITY AND LIABILITIES		373,662,679.38	273,291,880.39


The accounting policies and notes from page 05 To 22 an integral part of these Financial Statements.


These Financial Statements are in compliance with the requirements of the Sri Lanka Public Sector Accounting Standards (SLPSAS).


 I.M.N.P. Mangasinghe
 Accountant/HOD - Finance


 R.K.A.P. Ramanayake
 Additional Director (Admin & Finance)

The Board of Directors is responsible for the preparation and presentation of these financial Statements. These Financial Statements were approved by the Board of Directors and Signed on their behalf.


 H.M.A.P. Rathnayake
 Director /CEO(Actg)


 Prof. W.A. P. Weerakkody
 Chairman

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
CASH FLOW STATEMENT FOR THE YEAR ENDED 31ST DECEMBER, 2021

	NOTES	2021 RS.	2020 RS.
CASH FLOWS FROM OPERATING ACTIVITIES			
Surplus /(Deficit)		(2,251,968.79)	(4,719,340.24)
Non - Cash Movements			
Depreciation		44,655,476.02	37,761,161.39
Amortization of Capital Grants		(30,123,943.36)	(28,091,119.27)
Interest Income	10.1	(1,987,695.99)	(2,437,414.71)
Increase/(Decrease) in payables (Operating)	28	14,662,458.18	(27,043,843.76)
(Increase)/Decrease in other current assets (Receivables-Operating)	29	(22,253,449.30)	29,344,108.69
Net cash flows from operating activities		2,700,876.76	4,813,552.10
CASH FLOWS FROM INVESTING ACTIVITIES			
Purchase of Property, Plant and Equipment	30	(5,030,422.20)	(12,579,049.62)
(Increase)/Decrease non current assets	31	(222,358.72)	(98,456.11)
Net interest Received	10.1	1,987,695.99	2,437,414.71
Net cash from investing activities		(3,265,084.93)	(10,240,091.02)
CASH FLOWS FROM FINANCING ACTIVITIES			
Capital Grants	32	4,070,746.87	3,314,000.00
Increase/(Decrease) in Provisions for Gratuity Fund	33	2,269,247.50	4,994,280.16
Effect to Cash flow from Adjustments of Accumulated Surplus	34	984,971.72	1,154,260.41
Net cash flows from financing activities		7,324,966.09	9,462,540.57
Net increase/(decrease) in cash equivalents		6,760,757.92	4,036,001.65
Cash and cash equivalents at beginning of period	35	30,842,892.58	26,806,890.93
Cash and cash equivalents at end of period	36	37,603,650.50	30,842,892.58

The accounting policies and notes from page 05 To 22 an integral part of these Financial Statements.

STATEMENT OF CHANGES IN EQUITY FOR THE YEAR ENDED 31ST DECEMBER, 2021

Attributable to owners of the controlling entity													
	Initiate capital	Funds from Gen. Trea.	Assets Revaluation Surplus - Vehicle	Assets Revaluation Surplus - Plant & Machinery	Assets Revaluation Surplus - Computer	Assets Revaluation Surplus - Office Furniture	Assets Revaluation Surplus - Building	Accumulated surpluses/(deficit ts)		Total net assets			
	Rs.	Rs.	Rs.					Rs.		Rs.			
B/B/F as at Dec.31, 2020	69,907,594.42	96,136,703.14	34,702,988.00	11,316,204.17	938,717.46	2,175,824.67	-	(13,291,772.25)		201,886,259.61			
										-			
Adjustments to the Opening Balance								(268,039.55)		(268,039.55)			
								2,323,411.27		2,323,411.27			
Change in net assets for 2021	69,907,594.42	96,136,703.14	34,702,988.00	11,316,204.17	938,717.46	2,175,824.67	-	(11,236,400.53)		203,941,631.33			
Capital Grants		4,070,746.87											
Amotization of Deffered Income		(30,123,943.36)								4,070,746.87			
Assets Revaluation Surplus							118,184,856.80			(30,123,943.36)			
Surplus / (Deficit) for the period								(2,251,968.79)		118,184,856.80			
Balance as at Dec. 31, 2021	69,907,594.42	70,083,506.65	34,702,988.00	11,316,204.17	938,717.46	2,175,824.67	118,184,856.80	(13,488,369.32)		293,821,322.85			

The accounting policies and notes from page 05 To 22 an integral part of these Financial Statements.

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT

NOTES TO THE FINANCIAL STATEMENTS

Accounting Policies

1 Reporting Entity

1.1 Corporate Information

Institute of Post Harvest Technology is a body corporate, established on 19th June 2000 by the Extraordinary Gazette of the Democratic Socialist Republic of Sri Lanka No.1137/10 under the provisions of the State Agricultural Corporations Act. No. 11 of 1972. And, Institute's name has been revised as " National Institute of Post Harvest Management" on 17th October 2018 by the Extraordinary Gazette of the Democratic Socialist Republic of Sri Lanka No.2093/26

1.2 Principal Activities and Nature of Operations

The Institute carrying out post harvest research and development activities pertaining to cereals, pulses, oil seeds, other field crops, fruits, vegetables and spice crops.

1.3 Approval of Financial Statements by the Board of Directors

The Financial Statements of the Institute have been authorized for issue by the Board of Directors

2. Basis of Preparation

2.1 Statement of Compliance

The Financial Statements of the Institute have been prepared and presented in accordance with Sri Lanka Public Sector Accounting Standards (SLPSAS).

2.2 Responsibility of Financial Statements

The Board of Directors is responsible for the preparation and fair presentation of the Financial Statements of the Institute as per the Sri Lanka Public Sector Accounting Standards.

The Board of Directors acknowledges this responsibility in the Statement of Financial Position of the Institute.

2.3 Basis of Measurement

The Financial Statements have been prepared on the historical cost basis.

2.4 Functional and Presentation of Currency

The Financial Statements are presented in Sri Lankan Rupees which is the Institute's functional and presentation currency except when otherwise indicated.

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

2.5 Presentation of Financial Statements

The assets and liabilities of the Institute presents in its Statement of Financial Position are grouped by nature and listed in an order that reflects their relative liquidity and maturity pattern. No adjustments have been made for inflationary factors affecting the Financial Statements.

2.6 Materiality and Aggregation

Each material class of similar items is presented separately in the Financial Statements. Items of dissimilar nature or function are presented separately unless they are immaterial as permitted by Sri Lanka Public Sector Accounting Standards SLPSAS 1 ‘Presentation of Financial Statements’.

2.7 Offsetting

Assets and liabilities and income and expenses are not set-off unless permitted by the Sri Lanka Public Sector Accounting Standards.

2.8 Significant Accounting Judgements, Estimates and Assumptions

2.8.1 Going Concern

The Institute’s management has made an assessment of its ability to continue as a going concern and is satisfied that it has the resources to continue in operations for the foreseeable future. Furthermore, management is not aware of any material uncertainties that may cast significant doubt upon the Institute’s ability to continue as a going concern. Therefore, the Financial Statements continue to be prepared on the going concern basis.

2.8.2 Useful Lifetime of the Property Plant and Equipment

Useful economic lives of Property, Plant and Equipment are estimated as disclosed in Note 3.1 to the Financial Statements.

3. Significant Accounting Policies - Recognition of Asset and Liabilities

Accounting policies set out below have been applied consistently to all periods presented in the Financial Statements of the Institute unless otherwise indicated. Further, comparative year’s information has been presented.

3.1 Property Plant & Equipment

Property, plant and equipment are tangible items that are held for use in the production or supply of goods or services, for rental to others or for administrative purposes and are expected to be used during more than one period. The Institute applies the requirements of Sri Lanka PublicSector Accounting Standard – SLPSAS 7 - ‘Property, Plant and Equipment’ in accounting for these assets.

Basis of Recognition

Property, Plant and Equipment are recognised if it is probable that future economic benefits service potential associated with the asset will flow to the Institute and the cost of the asset can be reliably measured. The institute policy recognition of property, plant and equipment is the value higher than Rs.5000. But Library books are recognised even less than Rs.5000.

Measurement

An item of Property, Plant and Equipment that qualifies for recognition as an asset is initially measured at its cost. Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the asset to a working condition for its intended use and the costs of dismantling and removing the items and restoring the site on which they are located. Purchased software that is integral to the functionality of the related equipment is capitalised as part of computer equipment. When parts of an item of property or equipment have different useful lives, they are accounted for as separate items (major components) of property and equipment.

Cost Model

The Institute applies cost model to all Property, Plant and Equipment, and records at cost of purchase or construction together with any incidental expenses there on less accumulated depreciation and any accumulated impairment losses. Such cost includes the cost of replacing part of the equipment when that cost is incurred, if the recognition criteria are met.

Subsequent Cost

The subsequent cost of replacing a component of an item of Property, Plant and Equipment is recognised in the carrying amount of an item, if it is probable that the future economic benefits embodied within that part will flow to the Institute and it can be reliably measured. The costs of the day-to-day servicing of Property, Plant and Equipment are charged to the statement of Financial Performance as incurred. Costs incurred in using or redeploying an item is not included under carrying amount of an item.

Depreciation

Depreciation is recognised in profit or loss on a straight-line basis over the estimated useful lives each part of an item of Property and Equipment since this method most closely reflects the of expected pattern of consumption of the future economic benefits embodied in the asset.

Freehold land is not depreciated. Depreciations are calculated according to the days assets are used in purchasing year. GRN date is considered as purchasing date. The new estimated useful life time are as follows:

<u>Asset Category</u>	<u>Period</u>	
	<u>Purchased</u>	<u>Revalued</u>
Building	40 Years	20 Years
Plant & Machinery	10 Years	05 Years
Office Equipment	10 Years	05 Years
Lab & Research Equipment	10 Years	05 Years
Other Equipment	10 Years	05 Years

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

<u>Asset Category</u>	<u>Period</u>	
	<u>Purchased</u>	<u>Revalued</u>
Furniture	10 Years	05 Years
Electrical & Other Fittings	10 Years	05 Years
Library Books	10 Years	05 Years
Computer & Accessories	4 Years	4 Years
Vehicles	5 Years	5 Years
Software	5 Years	5 Years

Assets Revaluation

Class of building was revalued based on 2020 year and it was considered as at 31/12/2020. Revalued amount of building is shown in the books. Revaluation surplus was credited to building revaluation gain A/C. And accounted as at 31/12/2021. The adjustments for depreciations were done as well.

Assets Disposal

Tollaly depreciated assets which were not physically, sold and can not be identified were removed from the books.

3.2 Events after the Reporting Period

Events after the Reporting period are those events, favorable and unfavorable, that occur between the Reporting date and the date when the Financial Statements are authorized for issue. In this regard, all material and important events that occurred after the Reporting period have been considered and appropriate disclosures are made in the the Financial Statements where necessary.

3.3 Inventories

Inventories are valued at lower of cost and net realizable value. Cost is dertermined on the FIFObasis and includes expenses incurred in acquiring the inventories and bringing them to their existing location and condition.

3.4 Employee benefits

Defined contribution plans - Employees' Provident Fund and Employees' Trust Fund

All employees who are eligible for Employees' Provident Fund contribution and Employees' Trust Fund contribution are covered by relevent contribution funds in the line with respective statutes and regulations. Employees contribute 10% and, Institute contributes 12% and 3% of gross emoluments of employees to Employees' Provident Fund and Employees' Trust Fund respectively.

Defined Benefits Plan - Gratuity

A Defined Benefit Plan is a post-employment benefit plan other than a Defined Contribution planas defined in Sri Lanka Accounting Standard LKAS19 on"Employee Benefits".The Institute is liableto pay retirement benefits under the Payment of Gratuity Act, No.12 of 1983. Provision has been made in the Financial Statements for retirement gratuity as Employee benefit liability after the oneyear of service for all employees. Gratuity plan defines an amount of benefit that an employee will receive on retirement, usually dependant on one or more factors such as years of service andcompensation. The liability recognised in respect of employee benefit liability in the Statement of

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

Financial position is the present value of the defined benefit obligation at the reporting date together with adjustments for unrecognized past service costs. The employee benefit liability is calculated annually.

3.5 Provisions

Provisions are recognised if, as a result of a past event the institute has a present legal or constructive obligation that can be estimated reliably and it is probable that an outflow of economic benefit will be required to settle the obligation. Provisions and liabilities are recognised in the Statement of Financial Position.

4. Significant Accounting Policies - Income and expense

4.1 Revenue Recognition

Revenue is recognised to the extent that it is probable that the economic benefits will flow to the Institute and such revenue can be reliably measured. All Government and other grants are recognised initially as Recurrent Grant and are then transferred into the Capital Grant which used for Capital needs. The Capital Grants are recognised initially as deferred income and are then recognised in profit or loss as Amortization of deferred income on a systematic basis over the useful life of the assets. Average useful life time is considered as 7 years.

4.2 Borrowing Cost

All borrowing costs are expensed in the period in which they occur. Borrowing costs consist of interest and other costs that an entity incurs in connection with the borrowing of funds.

4.3 Tax Expense

As per the Sri Lanka Accounting Standard-LKAS 12 on 'Income Taxes', tax expense (tax income) is the aggregate amount included in determination of profit or loss for the period in respect of current and deferred taxes. Income tax expense is recognized in the Statement of Financial Performance except to the extent it relates to items recognised directly in equity or in Other Comprehensive Income (OCI), in which case it is recognised in equity or in OCI.

4.4 Research and Development Expenses

Research and Development expenses are allocated from capital budget. But Capital nature expenses are only recognised as assets. Recurrent nature expenses are charged to income statement. Salary arrears & arrears research allowances payments are considered expenses for the relevant year.

5. Statement of Cash Flow

The Statement of Cash Flow has been prepared by using the 'Indirect Method', in accordance with Sri Lanka Public Sector Accounting Standards – SLPSAS 2 on 'Cash Flow Statements'.

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

	2021 (Rs.)	2020 (Rs.)
6 General Treasury Fund - Recurrent	125,035,378.13	114,547,000.00
7 Transfers from Other Agencies		
MOA - For Research Projects		
Post Harvest Diseases of Mango	-	19,408.05
Oil Extraction of nutmeg & cinn.	-	13,530.85
Low Cost Fruit Matu.Iden.Ins	-	11,200.00
Per. Evaluation of Washing Equi	154,734.25	190,203.30
Quality impro.of fresh leafly ve	-	53,261.14
Mitigating Rice Stickiness	122,928.80	394,554.37
Investigation of Nutritional	9,060.00	143,305.44
Redu. of Post har. Loss Big Oni	-	427,136.50
Dev. of Ready to Use Formulatio	-	26,342.48
Enha. of Quality Characteristic	197,613.38	94,996.30
Dev. of Heat Pump Dryer	-	65,150.00
Eval. of the chemical residue.	-	204,319.40
field Appli. of rice husk silic	-	145,292.42
	484,336.43	1,788,700.25
MOA - Development Projects		
17-2-10 · Introduction of Safe Packaging	28,790,791.24	62,874,986.64
17-2-11 · Dev. a Tec.Sou.Rea.Dis. Network	5,303,933.83	-
17-2-12 · Dev.Cott.le.Rice Proce.Industry	4,205,841.15	-
17-2-13 · Establi.pulse de-hulling units	856,007.58	-
17-2-14 · Dv. of on farm storade faciliti	1,747,423.00	-
17-2-15 · Estab.Seconddry Processing Cent	2,170,488.94	-
17-2-16 · Intro.Spice Proce. micro enterp	1,053,459.97	-
17-2-17 · Establishment of medium scale	28,080.00	-
17-2-18 · Upgrading the Laboratory Facili	56,385.00	-
	44,212,410.71	62,874,986.64
	44,696,747.14	64,663,686.89
8 Amortization of Capital Grants	30,123,943.36	28,091,119.27

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

		2021 (Rs.)	2020 (Rs.)
9 Self Generated Income			
Machinery Sales - Parboiling Vessels - GP		114,559.50	81,950.00
Machinery Sales - Puls dehuler -GP		9,587.00	129,535.00
Hostel Income - Accomodation	9.1	1,441,700.00	2,080,950.00
Hostel Income - Food & Beverage	9.2	407,660.20	155,566.36
Training Program	9.3	226,241.38	495,095.27
Consultancy fees	9.4	567,329.00	237,048.00
Auditorium fees	9.5	333,000.00	602,255.00
Income from Laboratory Services	9.6	518,748.25	649,398.33
Sale of Publications		1,755.00	12,910.00
QC Certification of Fruits		-	35,850.00
Income from Garden		1,400.00	7,550.00
		<u>3,621,980.33</u>	<u>4,488,107.96</u>
10 Other Income			
Interest Income	10.1	1,987,695.99	2,437,414.71
House Rent		428,000.00	420,500.00
General Income		1,394,010.50	482,772.77
No Pay		245,963.85	221,725.00
Fines		-	2,000.00
Foreign Exchange Gain		2,485.69	-
		<u>4,058,156.03</u>	<u>3,564,412.48</u>
9.1 Hostel Income - Accomodation			
Income - External		1,247,800.00	
- Internal		193,900.00	
		<u>1,441,700.00</u>	
Expenditure		-	
		<u>1,441,700.00</u>	
9.2 Hostel Income - Food & Beverage			
Income - External		823,126.00	
- Internal		495,753.00	
		<u>1,318,879.00</u>	
Expenditure - External		594,106.40	
- Internal		317,112.40	
		<u>911,218.80</u>	
		<u>407,660.20</u>	

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

	2021 (Rs.)
9.3 Training Program	
Income	406,680.50
Expenditure	180,439.12
	<u>226,241.38</u>
9.4 Consultancy fees	
Income	1,524,535.00
Expenditure	957,206.00
	<u>567,329.00</u>
9.5 Auditorium Fees	
Income - External	225,000.00
- Internal	108,000.00
	<u>333,000.00</u>
Expenditure	<u>-</u>
	<u>333,000.00</u>
9.6 Income From Lab Services	
Income	620,680.00
Expenditure	101,931.75
	<u>518,748.25</u>
10.1 Interest Income	
NSB Fixed Deposit & Savings	1,423,767.52
Interest Income Other	
Special advance Interest	9,732.84
Distress Loan Interest	508,894.22
Special Loan Interest	45,301.41
	563,928.47
	<u>1,987,695.99</u>

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

EXPENSES			
		2021	2020
		(Rs.)	(Rs.)
11 Wages,salaries and employee benefits			
Salaries & Wages - Permanent staff		59,587,563.54	56,302,590.56
- Casual staff		1,993,786.34	3,266,068.79
Cost of Living		11,990,680.00	11,416,330.00
E.P.F.		8,617,464.12	8,335,624.08
E.T.F.		2,155,128.37	2,083,906.21
Research Allowances		1,536,860.85	2,655,346.75
Professional Allowance		2,534,400.00	2,344,876.75
Overtime and Holiday Pay		2,309,722.39	2,098,097.33
Other allowance		165,000.00	255,000.00
Gratuity		3,176,912.50	6,062,813.16
		94,067,518.11	94,820,653.63
12 Supplies and consumables used			
Printing and Stationery		1,107,603.35	831,544.61
Office Needs & Sundry expenses		979,467.61	1,007,609.67
Consumable for Research projects		60,351.00	112,574.24
Consumable for Laboratory		127,235.50	571,678.09
Lab Equipment Maintenance		1,722,211.48	202,543.79
Safty Measures		-	700.00
Running expenses of Hostel and kitchen		253,430.46	496,322.66
Fuel & Running expenses - vehicles & Other		3,580,001.69	3,187,693.50
Vehicles maintenance		2,506,568.83	2,514,270.11
Buildings Maintenance		2,988,440.40	434,144.75
Machinary Maintanance		1,100,674.14	317,735.97
		14,425,984.46	9,676,817.39
13 Depreciation			
Buildings		10,065,270.99	3,465,695.18
Plant & Machinery		3,217,586.56	3,201,203.00
Office Equipment		553,994.64	546,692.46
Laboratory & Research Equipment		13,825,376.41	13,729,802.30
Other Equipment		5,168,569.15	5,168,569.15
Furniture & Fittings		1,619,175.87	1,619,175.87
Electric & Other Fittings		53,588.71	53,122.68
Computer & Accessories		1,762,496.69	1,635,483.75
Library Books		106,149.83	106,149.83
Vehicles		8,018,100.00	8,018,100.00
Software		265,167.17	217,167.17
		44,655,476.02	37,761,161.39

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

	2021	2020
	(Rs.)	(Rs.)
14 Travelling Expenses - Domestic	425,775.51	447,778.45
Travelling Expenses - Foreign	-	-
Staff Tea	603,226.00	838,750.77
Periodicals, journals and news papers	43,680.00	44,880.00
Seminars	5,160.00	38,360.00
Training Programs	2,710.00	12,644.65
Entertainment	167,560.67	195,453.22
Contract Labour	65,100.00	41,250.00
Welfare	-	-
Insurance and licenses	451,185.95	557,938.11
Telecommunication	2,624,419.50	2,575,666.27
Postal charges	199,100.00	159,860.00
Electricity	1,601,693.13	2,055,705.11
Water,	854,675.84	930,302.27
Rent	711,880.00	1,782,130.00
Lease rental for vehicles	-	-
Rates and Taxes	204,726.10	214,640.17
Exhibition	-	-
Publicity	-	-
Human Resources Development	291,652.90	362,768.52
Audit fees	54,200.00	540,000.00
Legal Charges	-	-
Uniform Allowances	232,000.00	244,000.00
Transport	50,600.00	70,050.00
Cleaning Service	60,600.00	7,620.00
Security Service	2,595,500.00	2,014,600.00
	11,245,445.60	13,134,397.54
15 Project Expenses		
MOA - For Research Projects		
Post Harvest Diseases of Mango		19,408.05
Oil Extraction of nutmeg & cinn.		13,530.85
Low Cost Fruit Matu.Iden.Ins		11,200.00
Per. Evaluation of Washing Equi	154,734.25	190,203.30
Quality impro.of fresh leafly ve		53,261.14
Mitigating Rice Stickiness	122,928.80	394,554.37
Investigation of Nutritional	9,060.00	143,305.44
Redu. of Post har. Loss Big Oni		427,136.50
Dev. of Ready to Use Formulatio		26,342.48
Enha. of Quality Characteristic	197,613.38	94,996.30
Dev. of Heat Pump Dryer		65,150.00
Evalu. of the chemical residue.		204,319.40
field Appli. of rice husk silic		145,292.42
	484,336.43	1,788,700.25

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

	2021 (Rs.)	2020 (Rs.)
General Treasury - For Research Projects		
12-6101 · Dev.scie.based protocol for PH	149,772.08	
12-6103 · Postharvest loss assessment	45,923.53	
12-6105 · Design & deve. of monkey & bat	3,000.00	
12-6106 · Reduction of Postharvest Losses	137,773.00	
12-6107 · Potential of substituting wheat	49,393.04	
12-6108 · Effect of Carbohydrate Profile	19,005.00	
12-6109 · Servay on Rice mills & other ag	19,237.00	
12-6110 · Design & deve.process line for	245,378.80	
	669,482.45	
 MOA- Development Projects		
18-2-10 · Introduction of Safe Packaging	28,790,791.24	62,874,986.64
18-2-11 · Dev. a Tec.Sou.Rea.Dis. Network	5,303,933.83	-
18-2-12 Dev.Cott.le.Rice Proce.Industry	4,205,841.15	-
18-2-13 · Establi.pulse de-hulling units	856,007.58	-
18-2-14 · Dv. of on farm starage faciliti	1,747,423.00	-
18-2-15 · Estab.Secondry processing cente	2,170,488.94	-
18-2-16 · Intro.spice proce.micro enterpr	1,053,459.97	-
18-2-17 · Establishment of medium scale	28,080.00	-
18-2-18 · Upgrading the Laboratory Facili	56,385.00	-
	44,212,410.71	62,874,986.64
	45,366,229.59	64,663,686.89
 16 Finance Costs		
	27,520.00	16,950.00
	27,520.00	16,950.00

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

17. Property Plant and Equipments

Description	Building	Plant & Machinery	Office Equipment	Lab. & Research Equipment	Other Equipment	Furniture	Electric & Other Fittings	Library Books	Computer & Accessories	Vehicles	Software	Total
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Balance at the beginning of the period	143,876,822.01	17,204,159.99	4,343,275.15	83,662,436.82	41,306,950.38	9,699,114.14	407,296.83	2,534,226.81	6,541,935.00	40,090,500.00	1,085,835.84	350,752,552.97
Adjustments to Opening Balance												
Additions during the year	201,568,448.80	650,000.00	318,999.60	3,998,625.00	-	-	6,750.00	-	617,998.80	-	240,000.00	207,400,822.20
Revaluation												
Written off during the year	143,876,822.01											
Balance at the end of the year	201,568,448.80	17,854,159.99	4,662,274.75	87,661,061.82	41,306,950.38	9,699,114.14	414,046.83	2,534,226.81	7,159,933.80	40,090,500.00	1,325,835.84	414,276,553.16
Accumulated depreciation												
Balance at the beginning of the year	60,761,678.81	9,364,139.70	1,437,003.87	37,417,724.42	14,668,060.29	4,630,152.99	145,241.36	1,768,109.75	4,343,351.25	23,944,100.00	322,167.17	158,801,729.61
Adjustments to Opening Balance												
Charge for the year	10,065,270.99	3,217,586.56	553,994.64	13,825,376.41	5,168,569.15	1,619,175.87	53,588.71	106,149.83	1,762,496.69	8,018,100.00	265,167.17	44,655,476.02
written off during the year	60,761,678.81											60,761,678.81
balance at the end of the year	10,065,270.99	12,581,726.26	1,990,998.51	51,243,100.83	19,836,629.44	6,249,328.86	198,830.07	1,874,259.58	6,105,847.94	31,962,200.00	587,334.34	142,695,526.82
Carrying value as at 31st December 2021	191,503,177.81	5,272,433.73	2,671,276.24	36,417,960.99	21,470,320.94	3,449,785.28	215,216.76	659,967.23	1,054,085.86	8,128,300.00	738,501.50	271,581,026.34

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

	2021	2020
	(Rs.)	(Rs.)
18 Investments - Deposits		
National Saving Bank 2- 0001- 21-28195 -H/O	10,000,000.00	10,000,000.00
National Saving Bank 2- 0001- 21-28187 -H/O	10,000,000.00	10,000,000.00
	20,000,000.00	20,000,000.00
19 Other Non - Current Assets		
Distress Loan	13,578,502.51	13,325,588.13
Special Loan	1,084,979.63	1,115,535.29
	14,663,482.14	14,441,123.42
20 Cash & Cash Equivalents		
Bank of Ceylon - Torinton	529,671.51	529,671.51
People's Bank -Anuradhapura	26,860,703.62	21,523,613.22
National Saving Bank 1- 0005- 04-9129-2-Anuradhapura	926,520.89	894,706.34
National Saving Bank 1- 0001- 07-3208-7-H/O	9,286,754.48	7,894,901.51
	37,603,650.50	30,842,892.58
21 Receivables		
Debtors Control Account	488,358.39	489,577.39
Accrued Income	1,725,068.26	10,514,476.59
	2,213,426.65	11,004,053.98
21.1 Debtors Control Account		
Others	488,358.39	488,358.39
Sale -stole	-	1,219.00
	488,358.39	489,577.39
21.2 Receivables		
Accrued Income - General	199,630.00	199,630.00
Accrued Interest Income	322,465.76	322,465.76
Income Receivable	660,762.50	471,021.00
Income Receivable - Before 31/12/2018	37,410.00	37,410.00
Receivables for Mahaweli	504,800.00	504,800.00
- Receivables for Research Projects	-	8,979,149.83
	1,725,068.26	10,514,476.59

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

	2021	2020
	(Rs.)	(Rs.)
22 Inventories		
Stores -Paddy		
Research projects	101,500.00	101,500.00
Machin Fabrication - Raw material	156,416.00	134,316.00
Diesel - Generator	7,072.00	7,072.00
Stationary Stock	506,435.50	474,571.85
Consumable Stock	89,701.75	67,639.00
Chemical Stock	4,119,237.83	3,468,207.70
Parboiling Vessels Stock	266,090.00	610,060.00
Plastic Cr. Stock - Before 2020	164,876.80	
Plactic Crate Stock-From 2020	232,297.20	
Plastic Crate Stock-From 2021	20,483,388.00	
DP Pul dehul. ma. raw ma. Stock	1,176,383.17	
	27,303,398.25	4,863,366.55
23 Advances		
Festival	46,250.00	72,500.00
Traveling	33,138.90	33,138.90
Special Advance	9,200.00	61,200.00
Interim Advance	-	-
Interim Advance - Head Office	17,106.60	17,106.60
	105,695.50	183,945.50
24 Other current assets		
Services	192,000.00	675.00
House Rent Deposit	-	-
Work in Progress	-	-
Prepaid Postal Charges	-	5,000.00
Cash Transfer Control A/C	-	-
	192,000.00	5,675.00
25 Equity		
Initiate Capital	69,907,594.42	69,907,594.42
General Fund - Capital	70,083,506.65	96,136,703.14
Assets Revaluation Surplus - Vehicle	34,702,988.00	34,702,988.00
Assets Revaluation Surplus - Plant & Machinery	11,316,204.17	11,316,204.17
Assets Revaluation Surplus - Computer	938,717.46	938,717.46
Assets Revaluation Surplus - Office Furniture	2,175,824.67	2,175,824.67
Assets Revaluation Surplus - Building	118,184,856.80	
Accumulated Surplus / (Deficit)	(13,488,369.32)	(13,291,772.25)
	293,821,322.85	201,886,259.61
26 Provision For Gratuity Fund		
Gratuity fund	40,245,992.00	37,976,744.50
	40,245,992.00	37,976,744.50

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

		2021 (Rs.)	2020 (Rs.)
Current Liabilities			
27 Payables			
Advances	27.1	1,784,706.02	2,129,228.04
Accrued Expenses	27.2	4,175,559.21	13,666,518.58
Deposits	27.3	108,500.00	81,000.00
Retention	27.4	358,398.13	692,459.03
Creditors Control Account	27.5	33,168,201.17	16,473,045.00
Receipts in advance	27.6	-	386,625.63
		39,595,364.53	33,428,876.28
27.1 Advances - Suspense Account - General		-	201,090.56
- EPF		1,337,236.31	1,387,033.58
- ETF		182,350.42	189,140.97
- Stamp Fees		9,825.00	8,850.00
- Payee		1,200.00	6,600.00
Special Salary Advance		-	9,409.18
Salary Control A/C		254,094.29	327,103.75
		1,784,706.02	2,129,228.04
27.2 Accrued Expenses - Accrued Tax for Interest		-	-
-Accrued Expenses- General		2,921,359.21	3,498,280.25
-Provisions for Audit Expenses		1,254,200.00	1,200,000.00
-Head Office creditor		-	130.00
- Payables for Research Projects		-	8,968,108.33
		4,175,559.21	13,666,518.58
27.3 Deposits			
Tender - R&D		108,500.00	81,000.00
		108,500.00	81,000.00
27.4 Retention			
Contract Works		358,398.13	553,187.03
Regional Economic Advancement Project 2 -Matale		-	139,272.00
		358,398.13	692,459.03

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

	2021 (Rs.)	2020 (Rs.)
27.5 Creditors Control Acc. Other creditors - Various products	-	329,295.00
Plastic crates-Fund - Before 31/12/2018	3,900.00	-
New Plastic Crates Fund	11,130,530.00	16,143,750.00
50% Contribution of DP	374,000.00	-
Re. Fund for Non-Distributed PC	20,483,388.00	
Re.Fund for Pul. Dehulr Project	1,176,383.17	
	33,168,201.17	16,473,045.00
27.6 Receipts in Advance		
Receipts in advance - Deyata kirula	-	285,486.80
Receipts in advance - Saarc	-	101,138.83
	-	386,625.63

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

		2021 (Rs.)	2020 (Rs.)
28 Payables			
Advances	27.1	1,784,706.02	2,129,228.04
Accrued Expenses	28.1	4,175,559.21	5,170,548.65
Deposits	27.3	108,500.00	81,000.00
Retention	27.4	358,398.13	692,459.03
Creditors Control Account	27.5	33,168,201.17	16,473,045.00
Receipts in advance	27.6	-	386,625.63
		39,595,364.53	24,932,906.35
Balance as at 1.1.2021		24,932,906.35	51,976,750.11
Less : Balance as at 31.12.2021		39,595,364.53	24,932,906.35
Increase / (Decrease) Liabilities		14,662,458.18	(27,043,843.76)
28.1 Accrued Expenses	27.2	4,175,559.21	13,666,518.58
Less :- Non-trade creditors		-	(8,495,969.93)
Trade Creditors		4,175,559.21	5,170,548.65
29 Current Assets			
Stocks	22	27,303,398.25	4,863,366.55
Advances	23	105,695.50	183,945.50
Other Current Assets	24	192,000.00	5,675.00
Debtors Control Account	21.1	488,358.39	489,577.39
Accrued Income	29.1	1,725,068.26	2,018,506.66
		29,814,520.40	7,561,071.10
Balance as at 1.1.2021		7,561,071.10	36,905,179.79
Less : Balance as at 31.12.2021		29,814,520.40	7,561,071.10
Increase / Decrease Current Assets		22,253,449.30	(29,344,108.69)
29.1 Accrued Income	21.2	1,725,068.26	10,514,476.59
Less :- Non-trade Receivables		-	(8,495,969.93)
Trade Receivables		1,725,068.26	2,018,506.66
30 Property, Plant and Equipment			
Additions during the year		207,400,822.20	21,561,119.55
Less :- Assets acquired on credit basis		-	(8,495,969.93)
Less :- Assets Received as a grant		(1,070,400.00)	(486,100.00)
Less :- Assets Revalued		(201,300,000.00)	
Assets acquired on cash basis		5,030,422.20	12,579,049.62
31 Investment - Deposits			
National Saving Bank 2- 0001- 21-28195 -H/O		10,000,000.00	10,000,000.00
National Saving Bank 2- 0001- 21-28187 -H/O		10,000,000.00	10,000,000.00
		20,000,000.00	20,000,000.00
Distress Loan		13,578,502.51	13,325,588.13
Special Loan		1,084,979.63	1,115,535.29
		14,663,482.14	14,441,123.42
Total Non - Current Assets		34,663,482.14	34,441,123.42
Balance as at 1.1.2021		34,441,123.42	34,342,667.31
Less : Balance as at 31.12.2021		34,663,482.14	34,441,123.42
Increase / Decrease Non Current Assets		222,358.72	98,456.11

NATIONAL INSTITUTE OF POST HARVEST MANAGEMENT
NOTES TO THE FINANCIAL STATEMENTS

		2021 (Rs.)	2020 (Rs.)
32	Capital Nature Funds Received	4,070,746.87	3,314,000.00
	Less :- Fund Receivables	-	-
		<u>4,070,746.87</u>	<u>3,314,000.00</u>
33	Non- Current Liabilities		
	Provision For Gratuity Fund		
	Balance as at 1.1.2021	37,976,744.50	32,982,464.34
	Less : Balance as at 31.12.2021	40,245,992.00	37,976,744.50
	Increase / (Decrease) Liabilities	<u>2,269,247.50</u>	<u>4,994,280.16</u>
34	Effect to Cash flow from Adjustments of Accumulated Surplus		
	Cash flow increase due to adjustments to Accumulated Surplus	<u>984,971.72</u>	<u>1,154,260.41</u>
35	Cash & Cash equivalents at the beginning of period		
	Cash at Bank		
	Bank of Ceylon - Torinton	529,671.51	9,030,171.51
	People's Bank -Anuradhapura	21,523,613.22	11,225,879.21
	National Saving Bank 1- 0005- 04-9129-2-Anuradhapura	894,706.34	861,466.61
	National Saving Bank 1- 0001- 07-3208-7-H/O	7,894,901.51	5,689,373.60
	Cash & Cash equivalents as at 01.01.2021	<u>30,842,892.58</u>	<u>26,806,890.93</u>
36	Cash & Cash equivalents at the ending of period		
	Cash at Bank		
	Bank of Ceylon - Torinton	529,671.51	529,671.51
	People's Bank -Anuradhapura	26,860,703.62	21,523,613.22
	National Saving Bank 1- 0005- 04-9129-2-Anuradhapura	926,520.89	894,706.34
	National Saving Bank 1- 0001- 07-3208-7-H/O	9,286,754.48	7,894,901.51
	Cash & Cash equivalents as at 31.12.2021	<u>37,603,650.50</u>	<u>30,842,892.58</u>
37	Machinery stock for the demonstration purpose is at Cost		<u>2,149,740.00</u>
38	The initiate Capitals of the INSTITUTE OF POST HARVEST TECHNOLOGY shown Rs 500,000,000.00		
39	Capital Grants recognised as amotization of deffered income on sytematic basis over 7 years . Previous years adjustments were done through accumulated surplus account. Current year adjustment was done against profit or loss.		

The Chairman

National Institute of Post Harvest Management

Report of the Auditor General on the Financial Statements and Other Legal and Regulatory Requirements of the National Institute of Post Harvest Management for the year ended 31 December 2021 in terms of Section 12 of the National Audit Act, No. 19 of 2018.

The above Report is sent herewith.

W.P.C. Wickramaratne

Auditor General

Copy: 1. Secretary - State Ministry of Promotion of Organic Fertilizer Products , Supply Regulation , Paddy and Cereals, Organic Food, Vegetables, Fruits, Chillies, and Potatoes, Seed Production and High Tech Agriculture

2. Secretary - Ministry of Finance

The Chairman

National Institute of Post Harvest Management

Report of the Auditor General on the Financial Statements and Other Legal and Regulatory Requirements of the National Institute of Post Harvest Management for the year ended 31 December 2021 in terms of Section 12 of the National Audit Act, No. 19 of 2018.

1. Financial Statements

1.1 Qualified Opinion

The audit of the financial statements of the National Institute of Post Harvest Management for the year ended 31 December 2021 comprising the statement of financial position as at 31 December 2021 and the statement of financial performance, statement of changes in equity and the cash flow statement for the year then ended, and the notes in relation with the financial statements, including a summary of significant accounting policies was carried out under my direction in pursuance of provisions in Article 154 (1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with provisions of the National Audit Act No. 19 of 2018 and Finance Act No. 38 of 1971. My report to Parliament in pursuance of provisions in Article 154 (6) of the Constitution will be tabled in due course.

In my opinion, except for the effects of the matters described in the basis for Qualified Opinion section of my report, the accompanying financial statements give a true and fair

view of the financial position of the National Institute of Post Harvest Management as at 31 December 2021 and of its financial performance and its cash flows for the year then ended in accordance with Sri Lanka Public Sector Accounting Standards .

1.2 Basis for Qualified Opinion

- (a) Although an intangible asset should be shown as a separate item in the statement of financial position that does not shown under property, plant and equipment, in terms of to Paragraph 117 (d) of Public Sector Accounting Standards of Sri Lanka No. 20, the value of computer software value cost at Rs.1,325,836 had been shown under property, plant and equipment in the statement of financial position.
- (b) The value of 06 different stock items held in storage as at 31 December 2021 cost at Rs.2,210,815 and stock items cost at Rs.884,883 belonging to 03 sections had not been adjusted in the financial statements. Therefore, the deficit of the year under review had been overstated by Rs.3,095,758 and the current assets had been understated by the same amount in the financial statements.
- (c) As a result of the expenses totalled to Rs. 2,733,795 pertaining to future years as per the preceding years had been adjusted against the operating income of the year under review, the deficit for the year under review had been overstated by Rs. 3,894,996 in the financial statements.

I conducted my audit in accordance with Sri Lanka Auditing Standards (SLAuSs). My responsibilities, under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of my report. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my qualified opinion.

1.3 Other Information Included in the Annual Report 2021 of the Institute

The other information comprises the information included in the Annual Report 2021 of the Institute, but does not include the financial statements and my auditor's report thereon, which I have obtained prior to the date of this auditor's report. The Management is responsible for the other information.

My opinion on the financial statements does not cover the other information and I do not express any form of assurance conclusion thereon.

In connection with my audit of the financial statements, my responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or my knowledge obtained in the audit or otherwise appears to be materially misstated.

If I conclude that there is a material misstatement in reviewing the Annual Report 2021 of the Institute, I am required to report that fact to those charged with governance for the correction purpose. If there are further uncorrected errors, they will be included in the report that I will table in Parliament in due course in accordance with Article 154 (6) of the Constitution

1.4 Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation of financial statements that give a true and fair view in accordance with Sri Lanka Public Sector Accounting Standards, and for such internal control as Management determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, Management is responsible for assessing the Institute's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless Management either intends to liquidate the Institute or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Institute's financial reporting process.

As per Section 16(1) of the National Audit Act No. 19 of 2018, it is required to maintain proper books and records of all its income, expenditure, assets and liabilities, to enable annual and periodic financial statements to be prepared of the Institute.

1.5 Auditor's Responsibilities for the Audit of the Financial Statements

My objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Sri Lanka Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Sri Lanka Auditing Standards, I exercise professional judgment and maintain professional scepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is

higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the management.
- Concluded on the appropriateness of the Management's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Institute's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Institute to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with those charged with governance regarding, among other matters, significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

2. Report on Other Legal and Regulatory Requirements

2.1 Specific provisions for following requirements are included in the National Audit Act, No. 19 of 2018 .

2.1.1 Except for the effects of the matters described in the basis for Qualified Opinion section of my report, I have obtained all the information and explanation that required for the audit and as far as appears from my examination, proper accounting records have been kept by the Institute as per the section 12 (a) of the National Audit Act, No. 19 of 2018 .

2.1.2 The financial statements presented is consistent with the preceding year as per the requirement of section 6 (1) (d) (iii) of the National Audit Act, No. 19 of 2018 .

2.1.3 The financial statements presented includes all the recommendations made by me in the previous year except the audit matters described in the basis for Qualified Opinion section of my report as per the requirement of section 6 (1) (d) (iv) of the National Audit Act, No. 19 of 2018 .

2.2 Based on the procedures performed and evidence obtained were limited to matters that are material, nothing has come to my attention;

2.2.1 To state that any member of the governing body of the Institute has any direct or indirect interest in any direct or indirect interest in any contract entered into by the Institute which are out of the normal cause of business as per the requirement of Section 12 (d) of the National Audit Act, No. 19 of 2018 .

2.2.2 To state that the Institute has not complied with any applicable written law, general and special directions issued by the governing body of the Institute as per the requirement of Section 12 (f) of the National Audit Act, No. 19 of 2018 except for the observations appear below;

Reference to Laws , Rules Directives	Observation
(a) Financial Regulation of Democratic Socialist Republic of Sri Lanka	As a result of the works being done without specifically identifying the tasks, the advances of 12 occasions provided in the year 2021 with a total value of Rs.194,720 had been settled by cash without incurring costs / by incurring less than 50 per cent of value. Similarly, in paying the relevant amount to the office, the payments had been made with a significant time delay.
i. F.R.371 (2) (a)	
ii. F.R. 880 (1) and F.R. 881	Actions had not been taken to get securities from any officer who had to give securities in terms of the Security Ordinance.
(b) Public Administration Circular No. 05/2008 dated 06 February 2008	Although all government agencies should introduce the Citizen Client Charter, the Institute had not prepared the Citizen Client Charter as at 28 January 2022, the date of audit.
(c) Paragraph 4.2.6 of the Public Enterprises Department Circular No. PED/12 dated 02 June 2003 regarding the Good Governance of Public Enterprises	Although the audit reports issued by the National Audit Office should be reviewed by the Board of Directors and necessary actions should be taken, actions had not been taken to review the matters included in those audit reports

and make solutions with regard to them during the 14 Board Meetings held from January 2019 to December 2021 .

- (d) Circular No. 03/2015 dated 14 July 2015
- Although the ad hoc sub-imprest should be issued only to the officers in Staff Grade, ad hoc sub-imprest had been granted to 08 officers belonging to the Secondary and Primary Grades during the year under review.

2.2.3 To state that the Institute had not performed according to its powers, functions and duties as per the requirement of Section 12 (g) of the National Audit Act, No. 19 of 2018 .

2.2.4 To state that the resources of the Institute had not been procured and utilized economically, efficiently and effectively within the time frames and in compliance with the applicable laws as per the requirement of Section 12 (h) of the National Audit Act, No. 19 of 2018 except for the observation appear below;

A sum of Rs. 53,357,400 had been spent during the year under review for the purchase of 22,350 large plastic baskets and 10,990 jumbo baskets from 02 suppliers. Nevertheless, these procurements had not been properly evaluated by the Technical Evaluation Committee continuously and the appropriate bidder has not been recommended to the Procurement Committee and due to the fact that 02 organizations that had submitted the quotations made purchases equally, the company had lost the opportunity to maintain an advantageous price through market competition.

2.3 Other Matters

- (a) Although conducting research and socializing its results is a major task of the Institute, the final reports of 16 researches conducted during the period from 2015 to 2020 had not been presented in a recognized journal or conference. Similarly, the final reports of 05 researches whose research period has ended, had not been submitted as at the date of this report and the matters such as failure to take appropriate actions to socialize the results of 04 research projects which have been started after the year 2015 and had been completed so far were observed in audit.
- (b) Gas Chromatograph Mass Spectrometer (GCMS) Machines which had been purchased for Rs. 15,216,575 for laboratory research activities in the year 2015 and maintain in a fully air-conditioned atmosphere incurring a maintenance cost of Rs . 275,000 annually had remained unused and idle even by the end of April 2022 . As the regular maintenance of this machine requires a high cost, the attention of the top management had not been drawn about the possibility of giving it to a useful government agency as well.
- (c) To produce and socialize the innovations after every research process carried out by the National Institute of Postharvest Management is a major objective. But, according to the Register of Manufactured Machines and Equipment maintained in the mechanical workshop during the period of 21 years from 2000 to 2021 , it was observed during the audit that, out of the 19 types of innovations that have been unveiled, only 02 types of machines have been socialized.
- (d) Even though a sum of Rs. 9,572,715, had been spent to obtain the patent rights for the findings of the Induction Of Fruit Ripening By Organic method research that was implemented between 2016 and August 2019 and to popularize the results of the research at the commercial level, the project was not at an operational level even by 30 April 2022 .

- (e) A number of 500 sample tests had been carried out at an expense of Rs. 1,956,120 in the year 2017 for the project to be implemented to examine whether the 04 types of heavy metals are contained in 07 types of food imported under the National Food Production Programme using the provisions of the Ministry of Agriculture. According to the related project report, it was confirmed that certain food items contain heavy metals such as Cadmium, Arsenic and Lead up to the maximum safety level. Nevertheless, as per the conclusions and suggestions of the report the amount spent on research had been fruitless due to the fact that the Institute did not carry out further inspection on the food items which contains heavy metals and did not provide information to all the parties responsible for taking proper action in this regard.
- (f) A 100 units of Gps Trackers for a Rs. 1,290,000 on 05 April 2018 and 130 units of Tempered Data Loggers for a Rs. 4,680,000 on 22 March 2018 had been purchased for the Supply and Value Chain Management Project of Agricultural Crops in Sri Lanka which was planned to be implemented during the period from 2017 to 2019 . Out of these, 72 GPS Trackers Units and 09 Tempered Data Loggers had remained unused in the warehouse even by 28 January 2022 . Due to the fact that the relevant equipment is not being used effectively the amount of Rs. 7,292,332 that had been spent for that Project had become a fruitless expense.

W.P.C. Wickramaratne
Auditor General .