Performance in the process of producing vegetable seeds locally

Report No : PER/A/2019/SEEDS

National Audit Office

Content

01. Executive Summary

Local production and imports of seeds have increased rapidly, when the private sector has begun to contribute to seed production and imports in Sri Lanka since 1984. The Seed Act No. 22 of 2003 was enacted with the objective of alleviating various problems that arose in the production and import of seeds. Even though "the State Policy on Seeds and Planting Materials" has been mentioned as the Seed Policy in 1997, it has not been gazetted as of 1 January 2021.

Accordingly, the Seed and Planting Material Development Center established under the Department of Agriculture, is the leading institute operating in Sri Lanka for seed-related activities and its objective is to provide quality seeds and planting materials to farmers at reasonable prices and convenient locations on time. The Horticultural Crops Research and Development Institute conducts research on the production of breeder seeds required for local cultivation and the introduction of new vegetable varieties.

Although the Government has spent a large amount of money annually on the promotion of the local seed industry, according to the research report published in 2018 by Hector Kobbekaduwa Agrarian Research and Training Institute, there is a 70 percent probability to choose imported hybride verieties by local vegetable farmers. Various media have reported that farmers are not getting an adequate supply of local vegetable seeds, problems with their quality, and problems faced by farmers in using imported seeds. The National Seed Council, established to carry out the functions specified in the Seed Act, met for the first time on 29 November 2017 elapsed 14 years after the Seed Act Enactment, and then met only three times during the period up to 31 December 2019. Accordingly, the evaluation of the progress of local seed production, other relevant policy formulation, and necessary decision-making process had not been carried out actively.

Against such a background, this performance audit was conducted to evaluate the involvement of government agencies in providing farmers with quality vegetable seeds for cultivation at reasonable prices at right time.

The audit evaluated the seed production, storage, distribution and marketing carried out by the Seed and Planting Material Development Center and also evaluated the role played by the Seed Certification Service for the production of quality seeds.

Insufficient research on vegetable seeds, inaccurate forecasts of seed quantity required annually, failure to produce seeds as required, problems in seed storage procedures resulting in a loss of Rs.38 million worth of vegetable seeds during the period from the year 2014 to the year 2019 were to be discarded on weakening the germination were among the major observations made during this audit.

When seeds were sold, no computerized programs were used to quickly track the stock available in the company's entire sales network and the stores in the warehouse. There was no formal system for contacting Agrarian Service Centers for selling seeds. It was observed that only a small number of Agrarian Service Centers purchased seeds, from the Seeds and Planting Materials Development Center.

In such a situation a large number of vegetable seeds that can be locally produced as well as other vegetable seeds have to be imported. The cost of importing vegetable seeds which were Rs. 962.7 million in 2015 had increased by 35% to Rs. 1491.6 million in 2019 as compared to that year. Although it was expected to reduce the import of vegetables and other crops by 1/3, according to the budget estimates of the Ministry of Agriculture for the years 2016 and 2017, that objective was not achieved. Also, the Department of Agriculture had imposed maximum import restrictions only on bean seeds when issuing vegetable seed import licenses and in fact, the Sri Lanka Customs and the Department of Agriculture did not have data on the number of seeds imported from each vegetable.

To increase the amount of research being conducted on the introduction of local vegetable seeds that can compete with imported seeds, to determine and maintain seed stock levels keeping the minimum safe seed stocks on demand in the country by the Seed and Planting Material Development Center, to take action for the development of the unused land area in the 27 seed production farms belonging to the Seeds and Planting Material Development Center and use for seed production, to provide trained labour in a long term manner for the maintenance of the seed farms, to provide solutions to water problems, to expand the facilities available in the seed farm and to contact government agencies including Agrarian Service Centers in addition to the outlets at the Seed and Planting Material Center for seed sale are recommended in order to alleviate these problems.

2. Introduction

2.1 Background

Due to the favorable climatic and geographical conditions of Sri Lanka for agriculture, it is possible to grow many local vegetables for consumption throughout the year. The vegetables grown in this way are broadly classified as up country vegetables and low country vegetables. Upcountry vegetables include cabbage, carrots, leeks, beetroot, beans, tomatoes, capsicum, cauliflower, knol khol and potatoes, while low country vegetables include pumpkin, cucumber, okra, brinjal, leafy vegetables, and long beans. When considering the seed production required for these vegetable crops, most of the seeds of up country vegetables are imported. Although the required low country vegetable seeds can be produced locally, a large quantity of them is also imported.

Vegetable seeds are produced in three stages, and the seed varieties identified at the research level are the Breeder Seed, and the seeds obtained by multiplication are the Basic Seed. Standard seeds are the seeds obtained by multiplying the basic seeds for large scale cultivation. Of these seeds, the Department of Agriculture has the monopoly power to produce breeder seeds identified at the research level.

From the colonial period onwards, the production of seeds required for local cultivation was done locally by the farmers. After the establishment of the Department of Agriculture under British Law in 1912, botanists working at the Central Agricultural Research Institute became involved in the breeding and production of important seeds as food crops. An organized seed field was established under the Department of Agriculture around 1950 and until about 1980 the Department of Agriculture was the main supplier of seeds in Sri Lanka. The contribution of the private sector to the production and import of seeds in Sri Lanka began in 1984.

2.1.1 National Policy on Seeds

Production and distribution of high quality seeds and planting material in a competitive environment with the participation of the public and private sectors, enforcement of strict regulations on seed and planting material quarantine and state certification, ensuring the safety of seeds by keeping certified recommended safe seed stock, enforcing regulations to maintain the quality of seeds and planting materials available in the market, and

discouraging the import of genetically modified crops are include in the National Policy on seeds and planting materials.

Since 1984, the private sector has entered into seed import and production. As a result, the Seed Act No. 22 of 2003 was promulgated for the successful implementation of the "State Policy on Seeds and Planting Materials" formulated under the Ministry of Agriculture, Lands and Forests in March 1997 with the objective of mitigating the problems caused by the rapid increase in seed production and imports as mentioned by the Director General Agriculture.

2.1.2 Related Institutions

The line ministry and department dealing with vegetable seeds are the Ministry of Agriculture and the Department of Agriculture. The Seed Certification and Plant Protection Center, Seed and Plant Material Development Center and the Horticultural Crops Research and Development Institute under the Department of Agriculture are active in vegetable seeds.

The main role of the Seed Certification and Plant Protection Center is to protect the country's agriculture in every possible way, to prevent the entry of foreign pests into the country, to ensure the quality of the seeds and to promote the seed industry and to conserve genetic resources for future use.

The role of the Seed and Planting Material Development Center is to provide quality seeds and planting material to growers in a timely manner, at convenient locations and at reasonable prices, and the role of the Horticultural Crops Research and Development Institute is to breed high quality high yielding vegetable and root and tuber crops, dealing with crop management and cultivation technology, including crop installation, crop pruning, training, etc., and improving the technology of cultivation in safe houses, and hydro conic systems and the technology of organic vegetable production.

2.1.3 Seed Classes

(a) Breeder seeds

Breeders' seeds are the initial seed generation in the seed multiplication process. The breeding seeds are obtained from the nuclear seeds safely maintained by the breeder in the research institutes of the Department of Agriculture and only a small quantity of high-quality seeds is produced. The breeders responsible for the breeding of each crop variety carry out these activities under their special supervision in the fields of their research institute or the existing Utility Research Institute. It is expected to maintain 100% purity of variety. To this end, seeds are obtained from healthy, vigorous plants that have confirmed varietal characteristics through regular field inspections. All necessary steps will be taken to provide the necessary background for the optimal growth of the crop for which seed is expected to be obtained. At the same time, special attention will be paid to seed borne diseases, maintaining segregation gaps and history of the field. Production of breeders' seeds for local vegetable seeds is carried out by the Horticultural Crops Research and Development Institute under the Department of Agriculture.

After the Seed and Planting Material Development Center informs the research centers of the need for breeder seeds for the next season, the research institutes carry out the installation of breeder seeds in the field using nuclear seeds as per the above requirement. Sending applications (Green card) for certification to the Deputy Director of the Seed Certification Service after the seed cultivation is established in the field (02 weeks after establishment). Once the cultivation is established, at least three field inspections should be carried out.

(i) First field inspection

During the growing stage before flowering - Registration of the field and conducting basic field tests and submitting reports.

(ii) Second field inspection

At the time of flowering,

(iii) Third field inspection

It is done about two weeks before harvest.

(b) Basic seeds

The seed generation obtained through the cultivation of breeder seeds is known as basic seeds and the basic seeds are produced only by the government seed production farms belonging to the Seed and Planting Material Center. Institutions that produce seeds locally should procure the basic seeds from the Seed and Planting Material Center.

(c) Standard seeds

The seed generation obtained through basic seed cultivation is called standard seed. Standard seed is produced by the Seed Production Farms owned by the Seed and Plant Material Center, Contract Seed Production Program and seed producers and individuals in private sector.

2.1.4 Recent Trends in Seed Production and Seed Imports

(a) The Government has spent money as follows on the functions of the Horticultural Crops Research and Development Institute, Seed Certification Service, Seed and Plant Material Development Center exist under the Department of Agriculture which deals with the production of local seeds.

Name of the Institution	**2017**		**2018**		**2019**	
	Provisions	**cost**	**provisions**	**cost**	**provisions**	**cost**
I. Horticultural Crops Research and Development Institute	Rs.M	Rs.M	Rs.M	Rs.M	Rs.M	Rs.M
Recurrent	35	23	52	43	32	26
Capital	28	29	66	48	44	32
II. Seed Certification Services						
Recurrent	21	19	34	34	11	10
Capital	17	19	23	16	28	12
III. Seed and Plant Material Development Center						
Recurrent	25	24	157	27	32	31
Capital	52	51	75	73	96	96

Source - Performance Reports of Department of Agriculture, (2017, 2018,2019)

In addition to purchase seeds under the Seed Production and Purchasing Program of the Seed and Plant Material Development Center Rs.M 295, Rs.M 494, Rs.M 355 and Rs.M 358 were spent in 2017, 2018 and 2019 respectively.

(b) The quantity of vegetable seeds imported during the period from the years 2015 to 2019 and the cost of importation(CIF price) for that are as follows.

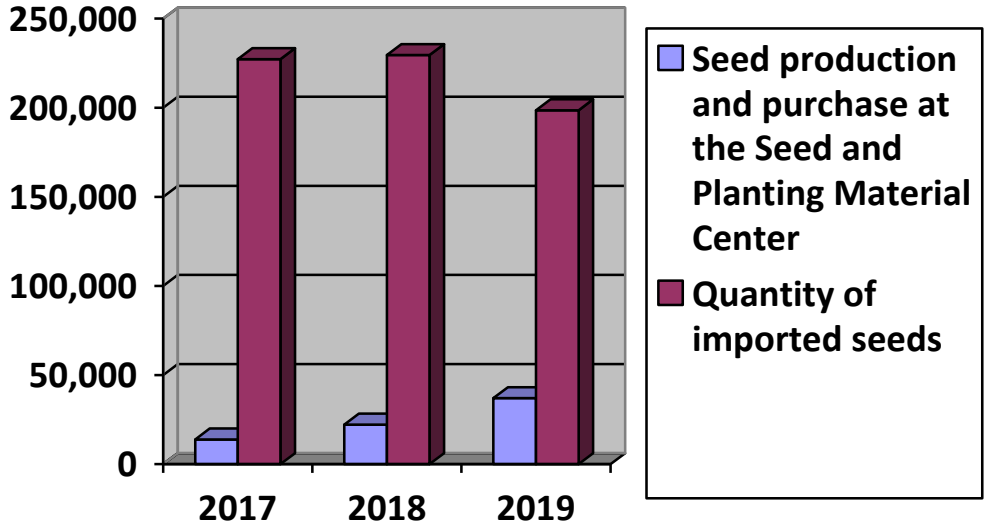
year	**Quantity of imported seeds Kg.**	**Import value Rs.M**
2015	226,152	963
2016	312,246	1,400
2017	227,255	1,195
2018	229,559	1,519
2019	198,595	1,491
	1,193,807	6,567

Source - Sri Lanka Customs

According to the above data, compared to the year 2015, the quantity in kilograms of seeds imported by the year 2019 had fell by 13 percent, while the cost of seed imports increased by 55 percent.

(c) The quantity of seeds produced by the Seed and Plant Materials Development Center and the quantity of vegetable seeds imported at high expense as mentioned above are as follows.

year	Seed production and purchase at the Seed and Planting Material Center	Quantity of seeds imported
	Kg.	Kg.
2017	13,856	227,255
2018	22,189	229,559
2019	37,042	198,595



Sources - Seed and Plant Material Center and Sri Lanka Customs

In the analysis of the above data, from the years 2017 to 2019, domestic vegetable seed domestic production is in the range of 5 to 16 percent, but it is increasing relatively. It is a good trend, but local farmer's dependence on imported seeds ranges from 84 to 95 percent.

2.2 Authority for Auditing

This audit was conducted under my direction in accordance with the provisions contained in Article 154 (1) of the Constitution of the Democratic Socialist Republic of Sri Lanka and Sections 3 (1)d 5 (2), 12 (h) of the National Audit Act No. 19 of 2018.

2.3 Audit Approach

According to research reports and various media outlets, about 70 percent of current local vegetable farming is based on imported hybrid seeds. The annual expenditure based on the year 2018 for that was Rs.1,519 million. Therefore, the Government has imported 1,193,807 kg of seeds spending a cost of Rs. 6,567 million. Problems have arisen regarding the sale of the seeds in the same stock obtained, at different prices and their quality such as resulting the cultivation of different varieties other than the varieties mentioned in the seed package, lack of seedlings, lack of expected yield, and presence of pathogens, etc. A Performance Audit has been carried out under this topic due to the problem of increasing the inclination towards imported seeds instead of expanding to locally produced seeds adapted to the local climate, and locality especially to back out the bad effect of imported seeds having the low cost and high yields in the agriculture with commercial purpose.

2.4 Audit Objective and Criteria

2.4.1 Main Audit Objective

Evaluating the supply of seeds required for cultivation to the local farmer at the right price, on time, at the right quality, at convenient locations and the performance of the government agencies responsible for the local seed production process.

2.4.2 Sub Audit Objectives

(a) To identify the activities of the institutions established for seed production activities and whether they are operating in accordance with the objectives of establishing those institutions.

(b) To study the applicable laws and regulations relating to local seed production and seed imports and evaluate the extent to which the relevant agencies comply with them.

(c) To evaluate the impact of dependence on imported seeds for local agriculture.

(d) To evaluate the adequacy of contribution for local seed production and for agriculture in Sri Lanka.

2.4.3 Audit Criteria

(a) Objectives of corporate and action plans of the Department of Agriculture

(b) Plans and targets of institutions involved in seed production and quality control

(c) National Seed Policy

(d) Seed Act No. 22 of 2003

(e) Plant Protection Act No. 35 of 1924

(f) Consumer Affairs Authority Act No. 9 of 2003

(g) Budget Estimate Targets Relating to Seed Production and Purchase for 2016-2018, Seed Production Programs

(h) Expected contribution of the Seed Council

(i) General standards for cultivable seeds

(j) Number of researches done for seeds relative to local seed requirement

(k) Seed research reports and seed production according to those reports

(l) Expected Breeder Seed Production Targets

(m) Percentage of average seed removed during production

(n) Capacity and standard conditions of seed storage

(o) Maximum Seed Import Limits

(p) Price variations of local and imported seeds

(q) Seed Production Guidelines

2.5 Audit Methodologies

(a) Reference to Websites / Annual Reports / Progress Reports / Annual Accounts / Research Reports of the relevant Institutions

(b) Calling for information through questionnaires / forms

(c) Conducting interviews with the officers engaged in the field

(d) Visiting seed production farms and obtaining observations.

(e) Analysis of the trend for imported seeds.

2.6 Scope of Audit

In evaluating the contribution of locally produced vegetable seeds to 12 locally grown vegetable varieties in this performance audit, researches and breeder seed production of the Horticultural Crops Research and Development Center established by the Department of Agriculture to conduct research on the production of local seeds and planting material and to maintain relevant services, and seed certification carried out by the Plant Development Center and basic and standard seed production, storage and distribution done by the Seed and Plant Material Development Center were considered. The facts such as minimum stock required to be maintained from each vegetable seeds, seed quality standards and life of seed have not been discussed scientifically. Whereas, operational status of the relevant institutions, seed market situation, tendency to shift to imported seeds instead of encouraging local seed production from 2016 to 2019 are discussed here.

3. Detailed Audit Findings

3.1 Fulfilling Legal Provisions and Related Functions

3.1.1 Implementation of the Seed Act No. 22 of 2003

A National Seed Council shall be established in terms of Section 4 of Part II of the Seed Act No. 22 of 2003 and the Council shall perform the following functions in terms of Section 06 of the Act.

(a) To establish guidelines and principles to ensure the production and distribution of seed and planting materials of the highest quality.

(b) To undertake periodic review of the progress of seed and planting materials production.

(c) To advise the Minister and other relevant authorities on all matters regarding the production of quality seeds and planting materials and the supplying of seed and planting material to farmers.

(d) To review the quality standards of seed and planting materials, periodically, with a view to developing the seed and planting material industry.

(e) To establish appropriate minimum limits for germination, viability, genetic purity, physical purity and appearance of seeds and planting materials and limits for genetic impurities of damaged seeds, water content and pests (including weed seeds) allowed in seeds available in the market.

(f) To legalize the minimum labeling requirements for seed containers and for planting materials available in the market.

(g) To determine the quality and minimum size of the seed containers for each specie, kind or variety of seed available in the market and to take appropriate action with regard to the protection of new plant breeders.

The following paragraphs describe the impact of the Seed Council's failure to actively contribute to other functions of the Seed Act, including evaluating the progress of local seed production.

3.1.2 Operations of the National Seed Council

The National Seed Council established to perform the legal requirements and for the performance of relevant functions in terms of Section 04 of the Seed Act No. 22 of 2003, met for the first time on 29 November 2017 and had met in 3 occasions during the period from 2017 to 31 December 2019. Although the National Seed Council had decided to meet as necessary or per every three months, meetings were not held accordingly. Hence, the National Seed Council had met for the first time elapsed 14 years after the enactment of the National Seed Act. The process of required decision making and preparation of other relevant policies including evaluation of the progress of local seed production had not been taken place actively as the Council had met only on three occasions as of 31 December 2019. Though the guidelines and policies for certification of best quality production and distribution of seeds and planting materials shall be made as per Section 6(a) of the Seed Act, the seed policy which has been gramulated has not been gazette as of 1 January 2021.

3.2 Determination of Seed Production Requirement and Research for New Seeds

3.2.1 Determination of the Seed Requirement

(a) The quantity of vegetables required annually for consumption in Sri Lanka has not been calculated and although the average per capita consumption of vegetables has been calculated in the Household Income and Expenditure Survey Report, 2016 of the Department of Census and Statistics, it does not include the quantity of vegetables purchased from institutions. Therefore, the total requirement for vegetable consumption had not been calculated.

(b) Under the Crop Forecasting Program of the Department of Agriculture, the monthly requirement of each vegetable has been identified and a price signal has been given for cultivation but no calculation of the seed requirement has been made.

(c) The Seed and Planting Material Center produces the basic seeds and standard seeds required for seed production locally. Although it was carried out in accordance with the seed production programs, it was not specified how much it represents the entire vegetable seed requirement. According to the information of Ministry of Agriculture, the maximum import restrictions were imposed only on bean seeds when licenses were issued for the importation of 11 varieties of vegetable seeds. However, the possibility of importing other seeds was allowed according to market behaviour.

(d) With the assistance of the Agricultural Research Production Assistants, the nearest public officer appointed by the Department of Agrarian Development to deal with farmers, no methodology had been created to obtain information on vegetable seed requirements of the farmers or to coordinate with them to determine the vegetable seed requirement. It was observed that the Department of Agrarian Development has the ability to obtain information to determine the need for seeds as it is the duty of the Department to provide the institutional, legal, assist and management services required by other agencies in the implementation of government agricultural and timely development projects.

3.2.2 Researches on Local Vegetable Seeds

(a) Researches conducted by the Horticultural Crops Research Institute

Researches on vegetable seeds should be done by the Horticultural Crops Research and Development Center exists under the Department of Agriculture. This institute has introduced 20 varieties of 08 types of vegetables under the new hybrid and open pollened varieties development and basic seed production project implemented during the period from 2016 to 2019 with a total cost of Rs. 56.7 million. Accordingly, 17 varieties including 12 varieties of 8 vegetables introduced under the above project were introduced during the period from 2011 to 2019. These varieties were mentioned as high quality, high yielding as well as resistant to pests. Annexure 1 shows the 12 types of vegetables such as Tomato, Bean, Pumpkin, Capsicum, Bitter gourd, long been, Cucumber, Thampala, Luffa, Brinjal, Okra and Carrot.

The observations in this regard are as follows.

I. Although the Carrot(Lanka Carrot) variety was introduced by the Horticultural Crops Research and Development Institute in 2011, its consumer demand was low due to lack of the characteristic orange color as found in the market, being an annual variety, flowering at delayed harvesting and greening the middle xylem of the taproot as mentioned by the Department of Agriculture. As a result, local carrot growers had to continue to rely on imported carrot seeds.

II. The Department of Agriculture stated that 'Prarthana', the capsicum variety introduced in 2015 will also be used for seed production after re-cleaning the varied traits as it has varied defects.

III. The Bandarawela Green Bean variety introduced by the Horticultural Crops Research and Development Center in 2012 was removed from use in 2018 due to poor germination of 1,329.7 kg seeds and its value was Rs.2 Million. It was observed that since the production of this variety is high compared to the existing demand, it is suitable to formulate the production plan considering the demand in the production of this variety as well as the reasons for its unpopularity among the farmers.

(b) The Horticultural Crops Research and Development Institute had failed to supply 55 percent of the quantity requested for breeder seeds of 9 varieties of 04 vegetable types requested by the Seed and Plant Material Development Center in the year 2016. Details are below.

Vegetables	Variety	Quantity applied for Kg.	Quantity supplied Kg.	Deficiency Kg.
Beans	Gannoruwa Bill	75	37.7	(37.3)
	Bandarawela Green	50	27.2	(22.8)
	Sanjaya	50	21.5	(28.5)
	Top Crop	100	42	(58)
	Lanka Butter	50	19.5	(30.5)
Cucumber	Kalpitiya White	02	1.9	(0.1)
Winged Beans	SLS - 44	20	8.2	(11.8)
	Krishna	20	6.2	(13.8)
Carrots	Lanka Carrot	2	0.225	(1.775)
Total		369	164.425	204.575

Source - Horticultural Crops Research and Development Center

(c) The Seed and Planting Material Center had requested only the vegetable seed variety without specifying the quantity of seeds required from the Horticultural Crops Research and Development Center, and the supply of breeder seeds decreased in quantity for the years 2017 and 2018 was 80 percent and 82 percent respectively.

(d) The Seed and Planting Material Center had suspended the sale of seed varieties Winged Bean - (Krishna) and Tomato - (Thilini) in the year 2018 due to changes in the varied characteristics of those varieties which were sold for cultivation by its outlets. Then the Department of Agriculture said that the purity of the variety "Thilini" was re-tested by the research divisions and the farmers were informed about the stocks of seeds in the genetically problematic varieties of Winged Bean (Krishna) and Tomato (Thilini) and the stocks were sold with their consent.

(e) Research conducted by Hector Kobbekaduwa Agrarian Research Institute

Hector Kobbekaduwa Agrarian Research and Training Institute conducted only two researches on "Contract Seed Production Program" in 2013 and "Hybrid Seed Production and Vegetable Cultivation Relative to Seed Requirement in Sri Lanka" in 2018. It was observed that the amount of research conducted on vegetable seed

production is in minimum level compared to the seed requirement as the role of this institute includes nurture, encourage and support agricultural researches.

3.3 Import of Seeds

3.3.1 Issuing Licenses for Import of Seeds

The Director General of Agriculture has the power to issue licenses for the importation of seeds as per Gazette Notification No. 165/2 issued on 02 November 1981 amending Section 447 of the Plant Protection Act, 1924. Accordingly, following are the details of seed quantities approved for import by import licenses regarding 11 types of vegetables during the period from 2017 to 2019.

Vegetable Type	2017			2018			2019		
	Were Licenses issued?	Maximum import limit (MT)	Quantity approved by the license (MT)	Were Licenses issued?	Maximum import limit (MT)	Quantity approved by the license (MT)	Were Licenses issued?	Maximum import limit (MT)	Quantity approved by the license (MT)
Snake gourd	Yes	-	0.475	Yes	-	0.35	Yes	-	0.4
Pumpkin	Yes	-	92.0115	Yes	-	62.305	Yes	-	96.644
Bean	Yes	187.10	187.100	Yes	108.6	108.6	Yes	163.000	163
Cucumber	Yes	-	37.423	Yes	-	30.7533	Yes	-	39.172
Bitter gourd	Yes	-	42.669	Yes	-	38.7555	Yes	-	44.06
Tomatoes	Yes	-	20.1805	Yes	-	15.5315	Yes	-	20.463
Capsicum	Yes	-	35.592	Yes	-	27.63	Yes	-	32.18
Winged Bean	No	-	-	No	-	-	No	-	-
Long Beans	Yes	-	18.06	Yes	-	31.16	Yes	-	30.2925
Okra	Yes	-	30.049	Yes	-	43.7105	Yes	-	32.727
Chili	Yes	-	0.28	Yes	-	0.2451	Yes	-	0.416
		187.10	463.84		108.6	359.04		163.000	459.35

Source - Department of Agriculture

According to above information, the following were observed.

(a) According to this information, maximum restrictions were imposed only on the import of bean seeds and quantities of 187.1 MT, 108.6 MT and 163 MT were allowed to be imported from 2017 to 2019 respectively.

(b) Although data on the total quantity of vegetable seeds imported could be obtained from the Sri Lanka Customs, there was no separate data on the quantity of seeds imported from each vegetable types. Accordingly, licenses had been issued for the importation of 464 MT, 359 MT and 459 MT of the above 11 types of vegetables in the three years 2017, 2018 and 2019 respectively, and the audit could not verify how many vegetables were actually imported. Accordingly, the absence of such data was an impediment to the satisfactory performance of seed regulation.

3.3.2 Imports of Vegetable Seeds

Although the Ministry of Agriculture had targeted to reduce the import of vegetables and other crops by 1/3 as per the National Seed Production and Purchasing Program in the Annual Budget Estimates for the years 2016 and 2017, it was observed that the imports of relevant vegetable seeds had not decreased according to the data obtained by the Sri Lanka Customs. Compared to the year 2015, the quantity of imported seeds by the year 2019 decreased by 13 percent, but the cost of seed imports increased by 55 percent, according to the following data. Accordingly, the cost of imported vegetable seeds increased by 76 percent per kilogram during the five year period from 2015 to 2019.

Year	Quantity of imported seeds Kg.	Value Rs.M	Average import cost per kilogram of seeds Rs.
2015	226,152	963	4,258
2016	312,246	1,400	4,483
2017	227,255	1,195	5,258
2018	229,559	1,519	6,617
2019	198,595	1,491	7,507
	1,193,807	6,568	

Source – Sri Lanka Customs

3.4 Regulatory Process in the Local Seed Market

3.4.1 Satisfaction of Seed Consumer Needs

In terms of Section 10 (i) of the Consumer Affairs Authority Act No. 09 of 2003, the Authority may issue general orders regarding the labeling, bidding, packaging, selling or manufacturing of any goods for the protection of the consumer. Further, special orders may be issued to manufacturers and traders of a particular class specifying the time at which the goods may be sold and the places where they may be sold, and any other terms of manufacture, import, sale, storage, sale and collection of any goods. At the inspection of the Consumer Affairs Authority's intervention in the purchase of seeds by farmers under these powers the followings were revealed.

(a) Special provisions regarding importation, distribution, pricing, selling and labeling of seeds had not been issued in terms of Section 10 of the Consumer Affairs Authority Act No. 09 of 2003. In terms of Section 18 of the Seeds Act No. 22 of 2003 which is empowered in these matters, the orders regarding these matters have not been prepared and implemented by the date of the audit.

(b) Seed Act No. 22 (2003) 6 (e) stipulates that as a function of the National Seed Council, there should be restrictions on the quality, physical purity, appearance, damaged seeds and limitations for pesticides regarding seeds and planting materials available in the market. Accordingly several farmers had made a complaint to the Consumer Affairs Authority regarding seeds purchased from the market in the years 2017 and 2018 .The Authority had obtained a report on seeds under Seed Act 14 (2) from the Seed Certification Laboratory of the Department of Agriculture and estimated the loss as Rs. 140,792 per hectare / acre and instructed the respondent to pay the relevant amount to the farmers. Although more than two years had elapsed from the date of making the complaint to 25 June 2020, the Consumer Affairs Authority had been unable to recover the losses to the farmers.

(c) Although up country vegetable seeds are imported as they are not produced in Sri Lanka, low country vegetable seeds are produced in Sri Lanka. However, most of these seeds are imported and their prices are higher than the local seeds at several times, according to the research report, "Hybrid Seeds and Vegetable Cultivation in Sri Lanka Local Vs Imported" published by Hector Kobbekaduwa Agrarian Research and Training Institute in the year 2018. According to the research report, the annual retail prices of lowland vegetable seeds in Dambulla in 2015 were as follows.

Annual Retail Prices of Low Country Vegetable Seeds (2015-Dambulla)

Crop	Imported Varieties			Local varieties		
	Type / Name	Quantity g.	price Rs.	Type / Name	Quantity g.	price Rs.
Tomato	Padma(F1)	10	1550	Maheshi (F1)	10	900
	Glori (OP)	10	1600			
Luffa	Naga(F1)	100	1576	LA33 (OP)	100	560
Bitter gourd	Pali (F1)	100	2920	MC43 (OP)	100	410
				Matale Green (OP)	100	465
				Thinnaweli (OP)	100	640
Pumpkin	Abhishek (FI)	100	2300	Ruhunu(OP)	100	475

Thus, it was observed that the price of imported vegetable seeds was higher than that of local vegetable seeds. The reason for farmers to buy imported seeds at higher prices is that there is not enough local seed supply to meet the consumer demand in the local market.

(d) Five farmers had complained to the Consumer Affairs Authority about germination and fruiting due to the poor quality of seeds purchased for cultivation and the sale at high prices on two occasions during the three years from 2017 to 31 December 2019. No final decision on compensation or legal action had been taken against the complainants until December 31, 2019.

(e) At the regional Agriculture Committee Meeting chaired by the Nuwara Eliya Divisional Secretary on 03rd April 2018, the Agricultural Research Production Assistants reported on the increase in the price of agro seeds during every season and the sale of the same seeds in the shops at different prices and the decrease in quality. Although the committee had decided to lodge a complaint with the Consumer Affairs Authority and the Seed Certification Service at the Seetha Eliya office, but no action had been reported.

3.4.2 The Quality of Commercial Seeds

Seed Certification Service of the Department of Agriculture certifies the quality of seeds in two main ways. That is to provide the Seed Certification Service and to implement the Seed Act. The health inspection of all stocks of breeder seeds produced by the Department of Agriculture has been started since 2017 and Seed Certification Service checks the health status of breeder seeds belonging to categories including paddy, supplementary food crops and vegetable crops Seed health inspection of vegetable seeds belonging to other seed classes is carried out by the certifying officers of the Seed Certification Service during field inspections. It is done only for the cultivations which are observed in the field for disease infection and problems. Research conducted by the Department of Agriculture's Socio-Economic Planning Center and Seed Certification Service on "Seed Quality Attention at the Sri Lankan Market Level" in 2017 also concluded that there are problems with the quality of vegetable seeds offered for sale in the market. . The observations in this regard are as follows.

(a) Samples are sent for seed health tests only in case of problems with the seeds provided to the farmers. Seeds produced by farmers under the Contract Seed Program and samples are sent for health testing only when the disease certifying problem conditions of the relevant seed crops are monitored by the seed certifying officers. This is observed below.

(i) When taking seed samples and sending them to the laboratories for testing, the seed samples should be sent to the laboratories without being exposed to any environmental conditions. However, it was reported that adequate transport facilities were not provided for that purpose.

(ii) It was observed that there were no training opportunities for the officers on seed certification, seed testing and evaluation in the field of seeds.

(iii) The Seed Certification Service had inspected about 260 and 220 private sector seed outlets in the years 2018 and 2019, respectively, and observed problems with paddy, vegetables, supplementary food crops and imported seeds.

(iv) Although, the remedies had been taken such as informing the traders who sold low quality seeds to remove the seeds from the market, stopping the sale of seeds, awareness on how to store the seeds, suspending the issuance of seed import licenses and informing the relevant agencies to correct the omission of correct information in the labels, it was observed that instead of such actions being taken, the business community had taken same actions again. However, it was observed that the Department of Agriculture had given the opportunity to field manufacturers, traders, importers and farmers to observe issues regarding the quality of seeds which was a good improvment.

(b) The Seed Certification Service inspects the seeds of seed producers under the Contract Seed Production Program of the Seed and Plant Material Development Center and 114.9 kg of seeds belonging to 22 farmers who had grown tomatoes were rejected in the two years 2018 and 2019 due to the failure of health condition of the seeds be tested. Details are given in Annex 2.

(c) Under the contract seed program, farmers lose the opportunity to earn income by rejecting the seeds after harvesting for seed production. Accordingly, no action had been taken to formulate a system to compensate the farmers or to prevent the harvest from falling victim to such situations.

(d) As per letter No. 02/29/A of the Director General of Agriculture dated 03rd February 2020 states that the farmers had to face the problems such as lack of germination, presence of mixed seeds, poor harvest quality etc. while using the seeds purchased by the farmers for cultivation. The details are given below.

Problems arising from the use of seeds sold to farmers or distributed for cultivation from 2017 to 2019

The nature of the problem	**Number reported**
i. KA $_2$ Chili seeds are heavily mixed with other varieties	2017 – 02 2018 - 01
ii. M1 $_2$ Large number of plants belonging to other varieties of chili seeds.	2019 - 01
iii. Lack of germinations - (Carrots) (Cabbage, cucumber, beans, Brinjal)	2017 – 01 2018 - 05
iv. Lack of proper yield and lack of characteristic features of the variety. (Brinjal, Luffa, knol khol l)	2017 – 01 2018 – 02 2019 - 01
v. Presence of pathogens (Presence of Phytoplasma pathogen transmitted by imported bitter gourd seeds.	2017 - 01
vi. Imported Japanese ball radish tuber blackening, leaf irregularity and pigmentation.	2019 - 01
vii. Germination of long bean crop when the seeds sold as bean seeds	2019 - 01

(e) At present a large number of vegetable seeds are imported and it was reported that the bitter gourd varieties were undergone with diseases within 3 to 4 weeks after planting and tomatoes to be harvested were undergone with diseases and destroyed according to the observations of the Seed Certification Service obtained from the field cultivation of the samples provided from the imported vegetable seeds for the 2016/2017 Maha season by the Plant Quarantine Service at the Bandaranaike International Airport, Katunayake. Luffa cultivation was successful in the first harvest but not in the second due to virus infection. Accordingly, although seeds are imported at a high cost, it is observed that problems with their quality adversely affect local vegetable cultivation

3.5 Local Vegetable Seed Production

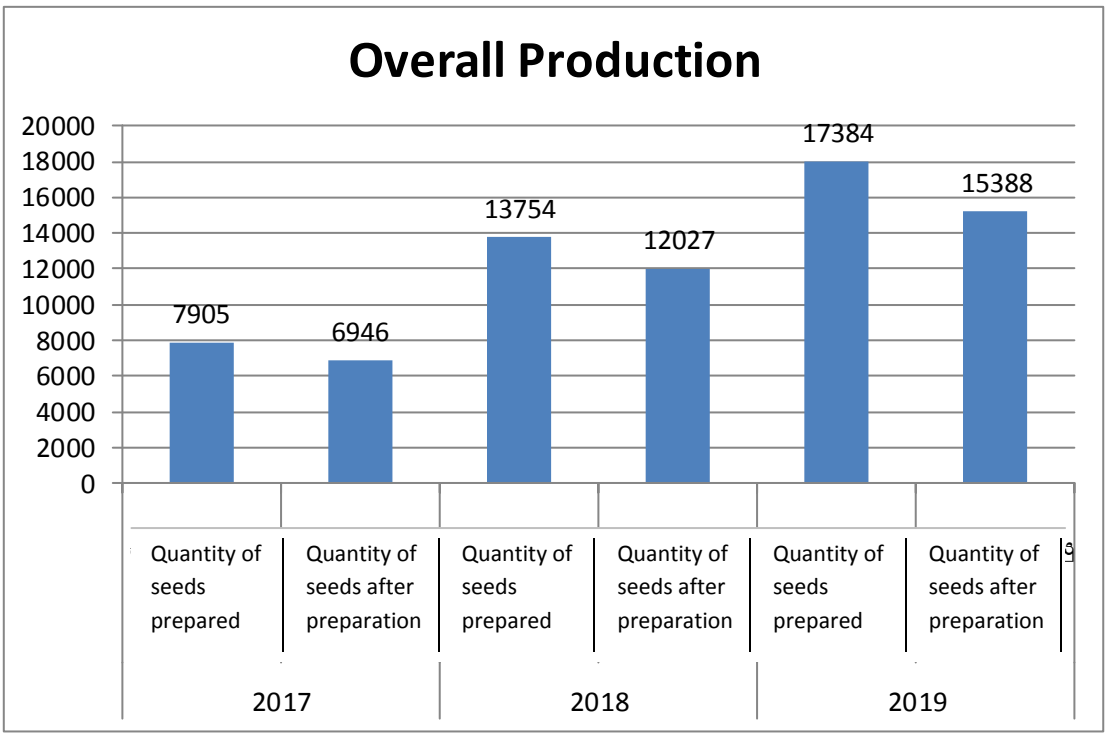
The Seed and Plant Material Development Center has 27 seed production farms which are working to achieve the desired production targets as per the seed production programs. Following are the audit observations on vegetable seed production by the Government Seed Production Farm.

3.5.1 Overall Seed Production at Kundasale Seed Production Center

All vegetable seeds produced by 27 Government Seed Production Farms owned by the Seed and Planting Material Development Center and the Contract Vegetable Seed Production Program, are processed by the Kundasale Seed Processing Center and handed over to the Gannoruwa Vegetable Seed Store. The details of 12 selected varieties of seeds from the years 2017 to 2019 are provided to the Seed Processing Center by the Seed Production Farm and Contract Vegetable Seed Programs and the quantity of seeds produced at the end of the Seed Production Process is given below**.**

	year					
	2017		2018		2019	
	Quantity of seeds to be prepared	Quantity of seeds after preparation	Quantity of seeds to be prepared	Quantity of seeds after preparation	Quantity of seeds to be prepared	Quantity of seeds after preparation
Vegetable type						
Beans	2099.6	2078.5	2125.5	1982.9	1433.7	1361.5
Brinjal	756.97	629.7	656	482.1	780	656
Capsicum	636.65	558.6	323.534	276.9	173.6	140.5
Cucumber	238.4	225.095	305.4	289.4	200	186
Luffa	123.3	112			370	334
Okra	2607.6	2076.4	4473.7	3892.3	3107	2724
Pumpkin	156.05	118	222.6	192.1	143	114
Tomato	140.8	127.7	279.6	254.7	194	165
Vegetable cowpea	748.7	689.1	3598	3109.3	8742	7679
Bitter gourd	397	330.8	1263.7	1125.7	2076.85	1882
Long beans			506.2	421.1		
Radish					164	146
Total	**7905**	**6,946**	**13754**	**12027**	**17384**	**15388**

Source - Vegetable Seed Processing Center (Kundasale)



The relevant observations are as follows.

(a) In the condition of not achieving the expected production targets by the Seed Production Farm, the quantity of seeds received by the Kundasale Seed Processing Center for 12 vegetable types was 7,905 kg, 13,754 kg and 17,384 kg and the quantity of seeds removed during seed processing had been reduced to 12.13 per cent, 12.56 per cent and 11.5 per cent in the years from 2017 to 2019 respectively. However, it was observed that the quantity of seeds removed during seed processing at the Seed Production Center should be further reduced.

(b) The production of bean seeds in the Government Seed Production Farm was reduced by 34 percent in 2019 as compared to 2017 since those production were 2078kg , 1983kg and 1361 kg during the period from 2017 to 2019 respectively. It was mentioned that the seed production has been reduced due to the availability of existing bean seed stocks. However, the reasons for this reduction were not clear for the increase of quantity of imported bean seeds from 108 metric tons in 2018 to 163 metric tons in 2019 as import licenses issued.

(c) Although the total seed production of 12 vegetable seed varieties processed at the Kundasale Seed Processing Center has increased by 6946 kg, 12067 kg and 15388 kg from 2017 to 2019 respectively, the quantity of vegetable cowpea in those stocks is had risen by 10%, 26% and 50% respectively. Thus, it was observed that the increase in seed production was mainly due to the increase in vegetable cowpea production. Although the contribution of sole vegetable seed variety to the overall seed production has increased as above, there has been no significant increase in seed production including brinjal, capsicum, cucumbers, pumpkins and tomatoes.

(d) Capsicum seed production had decreased by 75% in the year 2019 as compared to the year 2017. For these reasons, the audit observes that the declining seed production of capsicum which is a major local vegetable crop, has forced farmers to spend more foreign exchange in a more inclined manner towards imported seeds.

3.5.2 Cost of Seed Production and Achieving Targets

It was observed that the total of recurrent and capital expenditure on administration of the Seed and Plant Material Development Center, Seed Production Farm, seed storage, seed outlets and seed production machinery maintenance and improvements as well as for employee salary incurred by the Institute were Rs. 75, Rs. 115 million and Rs. 127 million from 2017 to 2019 respectively. Although a significant portion of the above expenditure was incurred on the activities of 27 seed production farms related to seed production, the performance of the seed production farms was as follows.

According to the information of 9 seed farms regarding production of vegetable seeds by the Government Seed Production Farms under the Seed Production Program, it was observed that achieving targets on seed production was at weak level. The seed farms in Kundasale, Aluthtarama, Pelwehera, Eluwankulama as a sample could not obtain any expected seed target in 22 occasions of the 6 seasons from the 2016 Yala season to the 2018/2019 Maha season and the failure to achieve the expected targets was in the range of 51 percent to 97 percent. Observations on seed production are as follows.

(a) Kundasale Seed Production Farm

Seed Production Data Analysis in annex 3 depicts that there are instances where the Seed Production Program has not been able to achieve the expected production targets from the 2016 Yala Season to the 2018/19 Maha Season. Relevant observations are made.

(i) According to the seed production program, the hybrid seed production of 3 vegetable types (brinjal, tomato, bitter gourd) was in the minimum range of 13 percent to 38 percent and it was not possible to produce seeds for the Cucumber, Gannoruwa seed variety due to cultivation failure.

(ii) According to the seed production program, 95 percent, 96 percent and 55 percent of the expected seed production target of 03 vegetables (beans, cucumbers, Snake guard) could not be produced respectively and any seeds of brinjal and bushitao could not be obtained due to cultivation failure.

(iii) According to the seed production program, it was not possible to produce standard seeds of beans and cucumbers and the seed production of 04 vegetable types (luffa, okra, snake gourd, brinjal) ranges between 45percent to 17percent.

The audit observed that the failure to achieve the seed production targets in these seed production farms was mainly due to water supply problems.

(b) Aluththarama Government Seed Production Farm

The land area of this seed production farm is 226.5 hectares and the land area used for seed production is 118.5 hectares. The extent of unutilized land is 108 hectares. It produces supplementary food crops as well as vegetable seeds. The followings were observed on the seed production during the three years from Yala season in 2016 to Maha season in 2018/19.

(i) Cucumber hybrid seeds were produced in 4 seasons during the period from 2016 to 2018. Although it was targeted to produce 75 kgs to 78 kgs during the 2018 Yala and 2018/19 Maha season respectively as per the seed production program, the quantity of seeds produced were 18 and 11 in kilograms respectively. Accordingly, it was observed that the expected seed production of 76 per cent and 86 per cent could not be achieved during these two seasons.

(ii) According to the Seed Production Program for the 2018/2019 Maha Season, the expected seed target for Okra only had been achieved through the basic seed production of 5 types of vegetables such as Okra, snake gourd, Long beans, Pumpkin and capsicum. Achieving other seed targets ranged from the maximum of 82 percent to 3 percent. Details are below.

Seed type	2018/19 Seed Production Program		
	Quantity of seeds to be produced	Quantity of seeds produced	Production percentage
	Kg.	Kg.	%
Okra	600	720.1	120
Snakegourd	300	63.1	21
Long beans	200	158.3	79
Pumpkin	75	61.5	82
Capsicum	37	1	2.7

Source - Seed Production Farm (Aluththarama)

(iii) The achievement of standard seed production targets for snakegourd, Long beans, brinjal and capsicum during the 2018 Yala season were 49 percent, 14 percent, 223 percent and 6 percent respectively. Achieving the desired targets was only for brinjal seeds. Details are as follows.

Seed type	Quantity of seeds produced	Production percentage
	kg	%
snakegourd	147.8	49
Long Beans	87.8	14
brinjal	44.6	223
capsicum	2.2	6

(iv) It was observed that only 2.2 kg of seeds could be obtained out of the expected seed production target of 38 kg due to non-germination of seeds provided for the production of standard capsicum seeds for the 2018 Yala season at Aluththarama seed production farm.

Thus, it was observed that the local vegetable seed production was not as expected and it affected to increase the quantity of imported seeds.

(c) Pelwehera Government Seed Production Farm

Basic production was not done on the farm and standard seeds for bitter gourd, cucumber and capsicum varieties were produced. The following observations are made on the production of vegetable seeds during the period of 3 years from the 2016 Yala season to the 2018/2019 Maha season.

(i) It is a good trend that 82 kilograms of bitter gourd seeds have been produced during the last season out of the period from 2016 Yala season to 2018/2019 Maha season with the target of producing 80 kilograms.

(ii) Although it was targeted to produce 10 kg during the 2018 Yala season, only 1.1 kg had been produced. Accordingly, 89 percent of the expected cultivation target had not been achieved.

(iii) The expected seed targets for brinjal and chili varieties in the 2018 Maha season were 80 kg and 20 kg respectively and the actual production were 31.8 kg and 17.4 kg respectively. Thus, 60 percent and 17 percent of the expected seed targets had not been met.

(iv) Although the target for hybrid seed production for chilies and brinjal was targeted as 60 kg and 2 kg in the year 2017 and 2018 respectively, the actual seed production was 28.270 kg and 800 g respectively. Accordingly, 53 percent and 60 percent of the expected seed production targets had not been met.

(d) Eluwankulama Government Seed Production Farm

(i) Although the basic seed production for the two varieties of tomatoes and brinjal in the farm had been started from the Maha season 2017, the seed production targets expected for brinjal only had been achieved. The expected seed production target for tomatoes had not been met by 75 per cent.

(ii) Although targets have been set to produce 20 kg of standard bitter gourd seeds in the 2018/2019 Maha season, seeds could not be produced.

(iii) Although 20 kg of standard seeds of cucumber were expected during the 2018 Yala season, only 800 g were produced.

3.5.3 Weaknesses in Seed Production Farms

(a) Ownership of lands

According to the information obtained from 10 seed production farms owned by the Seed and Planting Material Development Center, no legal action had been taken to acquire the legal ownership of the lands belonging to 05 farms and it was observed that most of the land available in these farms was not utilized to the maximum for seed production activities. Details are below.

Name of the farm	Land area (ht)	Extent of land used for cultivation (ht)	Extent of land not used for cultivation	Legal right
Ambalanthota	22	18.8	3.2	No
Ambepussa	60	10	50	No
Bata-atha Hungama	172	90	82	No
Mahailluppallama	195.69	159.91	35.78	Yes
Polonnaruwa	200.75	146	54.75	Yes
Piduruthalagala	133	59	74	Yes
Eluwankulama	20.05	18	2.05	Yes
Kundasale	49	14	35	No
Pelwehera	5	13.5	1.5	No
Aluththarama	226.5	118.5	108	Yes

Source - Department of Agriculture

(b) Labourers service

(i) Labor is required to be used extensively in seed production by the Government Seed Production Farm. Labor is essential for land preparation, seed planting, planting, crop maintenance, harvesting and seed processing. However, information obtained from seed production farms at Maha Illuppallama, Polonnaruwa, Kundasale, Eluwankulama and Pelwehera showed that production was hampered due to the inability to employ adequate workers. Accordingly, the staff details of these 5 farms are as follows.

Name of the farm	Position	Approved number	Actual number	Vacancies
Mahailluppallama	Labour - permanent	-	147	-
	Labour- Contract	44	39	05
Polonnaruwa	Labour - Permanent	97	76	21
Kundasale	Labour - Permanent	15	06	09
	Labour (25/2014 Permanent)	38	29	09
Eluwankulama	Labour - Permanent	25	15	10
Pelwehera	Labour- Contract	25	21	04

Source - Seed Production Farms of Seed and Planting Material Development Center

ii. It was observed that the inability to hire the required contract labour on time for seed cultivation and harvesting was an impediment to achieve the seed production targets. The seed farm managers stated that it was difficult to employ physically fit workers for cultivation due to the less salary paid to a contract worker in the seed farm as compared to the private sector.

(c) Wildlife damages

It was observed that a large yield was destroyed by wild animals such as wild boars, deer, parrots and peacocks due to non- preparation of a specific method to protect the cultivation during vegetable seed production at the Kundasale Farm. The crop destructions had been done even by wild elephants at Seed Production Farm, Eluwankulama due to non receipt of instruments used to protect the cultivation, although the Heads of the institutions were informed and requested thereof.

(d) Physical facilities

(i) It was possible to use two Delta seed Extraction Units which was idle worth Rs. 1,940,000. However, no action had been taken to transfer those machines to another farm as a new machine was available to use for primary processing of tomato seeds in the Kundasale Seed Production Farm.

(ii) It was observed that Pelvehera Government Seed Production Farm did not have a permanent water supply system required for cultivation and did not have the machinery required to separate the seeds. Although, no of 3 two wheel tractors and no of 2 four wheel tractors were used to prepare land for cultivation, it was reported that they were in a poor operating conditions.

(e) Kundasale Seed Production Farm

i. The land area of Kundasale Seed Production Farm is 49 hectares and at present the land area used for seed production is 14 hectares. Due to the lack of adequate water facilities, it is not possible to use about 06 hectares of land for cultivation.

ii. There are small tanks in the seed farm to collect rain water and it was observed that the volume of water that can be collected had decreased due to siltation and weed in those tanks at the physical inspection of the tanks in the B section of the Kundasale Seed Farm done on 23 December 2019. Accordingly, the inability to meet the adequate water requirement for seed production adversely affects seed production.

iii. The extent of the land belonging to the farm is not situated in a single area and the land represents the total land area in parts. The farm manager had reported that there was a risk of encroachment on the farm land as no separate land survey had been carried out to protect the entire land.

iv. The area where the Government Seed Production Farm is located receives 238 - 271 mm of rainfall during the months of October, November and December of the year, according to the farm's rainfall records. Accordingly, since rain water is the main method of obtaining water for the farm and there should have been a proper water management system based on the availability of that rain water only for three months of the year. Therefore, the seed production target could not be achieved.

v. The drip irrigation system was established in the year 2000 to provide water for cultivation in the Kundasale Seed Production Farm and it was observed during the physical inspection carried out on 23 December 2019 that more water is wasted in supplying water for cultivation as this system is inefficient.

(f) Eluwankulama Seed Production Farm

Although a cost of Rs. 2,369,000 had been spent for establishment of a water supply system which consist of 3 water pumps and buy to solar pumps in 2017 and 2018, due to salinity of the water expected harvest could not be obtained and no action had be taken to reduce salinity till 31 December 2019.

3.5.4 Contract Seed Production Program

This program is implemented by the Seed and Plant Material Developmen Center under the Department of Agriculture. After selecting, registering and training the farmers for the program, the Regional Offices of the Seed and Planting Material Center issue seeds to the farmers for cultivation on a cash basis. Farmers' cultivations are subjected to field inspections and seeds are procured by the regional offices after harvesting.

The details of the quantity of vegetable seeds purchased from farmers from 2017 to 2019 under the Contract Vegetable Seed Program are given below.

Crop	2017 Seed Quantity (Kg.)	2017 value	2018 Seed Quantity (Kg.)	2018 value	2019 Seed Quantity (Kg.)	2019 value
		Rs.		Rs.		Rs.
i.Beans	3010.5	3,360,450	7108.55	7,959,630	14701.25	16,818,325
ii.Bitter gourd	41.17	126,599	472.4	1,500,270	1126.6	3,494,975
iii.Luffa	73	211,700	11.7	33,930	263.9	765,310
iv.Okra	283	367,900	2016.3	1,674,640	1967.7	2,341,760
v.Snake gourd	149.5	373750	171.2	428,000	293.2	733,000
vi.Tomatoes	2.3	27,370	2	27,000	33	441,980
vii.Winged-Been	209.1	292,740	251.6	352,240	463.7	649,180
viii.Spinach	431.7	1,273,515	418.4	1,234,280	247	728,650
ix.Long beans	187.6	487,760	1,293.5	3,363,100	4111.2	1,0689,120
x.Capsicum	2	15,600			7.3	56940
xi.Cucumber	103.7	305,915	-	-	59	174,050
xii. Batu	2.5	10,250	-	-	-	-
xiii.Bushita	-	-	-	-	2380.85	2618,935
Total	**4496.07**	**6,853,549**	**11745.65**	**16,573,090**	**25654.7**	**39,512,225**

Source - Seed and Planting Material Development Center

The following observations are made in this regard.

(a) In the years 2017, 2018 and 2019 bean seeds had been purchased by the entire program as 67 percent, 60 percent and 57 percent respectively. An expenditure of Rs.28, 138,405 had been spent during these three years and it was 45 percent of the total expenditure.

(b) After a survey, the need for local vegetable seeds was identified and only the quantity that could not be produced by the government seed farm should be produced under the contract program to meet that demand, but the audit did not observe whether it was compliant.

(c) It was observed at the field inspections done by officers of the seed certification service that cultivations of 11 farmers had failed during the period from the 2016 Yala season to the 2018 Yala season due to non-maintenance of the minimum isolation gap that should be maintained between cultivations by the farmers

owned by the office of the Deputy Director of Agriculture, Kundasale. Accordingly, it was observed that the cultivations of those farmers could not contribute to the production of seeds.

Season	Number of farmers	Name of the crop	Extent of cultivated land (ha)
2016 Yala	02	Tomato	0.1
		Capsicum	0.2
2016/17 Yala	08	Tomato	0.1
		Capsicum	0.3
		Chili	0.1
2018 Yala	01	Tomato	0.1

Source - Seed Certification Service (Kundasale)

(d) The Seed and Planting Material Development Center will not be able to achieve the desired targets of seed production due to the failure of the farmers selected under the contract program for seed production to maintain their minimum isolation gap. Also, the farmers were not able to get the expected income. It was observed that as this situation sometimes occurs in situations beyond the control of the farmers, it is important to provide relief to the seed producing farmers as well as to formulate a contract seed program to prevent and minimize such a situation.

(e) The Seed and Plant Material Development Center registers farmers for the Contract Seed Production Program and provides them with the required vegetable seeds. The contract vegetable seed production program implemented by the Kundasale Deputy Director of Agriculture in 2016 and 2017 had completely failed due to the dry weather. It is observed that this condition is caused by heavy rains dry weather during some seasons and as a solution a program is required to produce vegetable seeds in greenhouses or to provide water supply for cultivation.

(f) Due to the presence of heavy rains and dry weather during some seasons, vegetable seeds can be produced in greenhouses as a remedy. There are large number of greenhouses of 500-1000 square feet in Kandy, Matale and Kegalle areas. Although the Agriculture Instructor Kundasale has requested approval in the year 2018 to prepare a suitable program for seed production with the assistance of seed certification in collaboration with the owners of those greenhouses, it was observed that no necessary action was taken.

(g) Although it is expected to purchase 6,000 kg of bean seeds from 6 hectares of cultivable land under the Contract Seed Production Program prepared by the Seed and Planting Material Development Center for the 2019 Yala season, 12,439 kilogrames of bean seeds were procured. Accordingly, 6,439 kilograms of bean seeds were procured in excess of the expected quantity. Details are below.

Bean Type	**Quantity of Bean seeds purchased by the Farm**	**The quantity of seeds to be purchased according to the programme**	**Excess seed quantity**
	(kg.)	**(kg.**	**(kg.)**
Lanka butter	4,740	2,500	2,240
Balangoda blue	7,699	2,000	5,699
TC	-	1,500	(1,500)
Total	12,439	6,000	6,439

(h) According to the information obtained by the audit on the Contract Seed Production Program implemented in 6 Cultivation Seasons from the 2017 Yala Season to the 2019 Yala Season by the Office of the Deputy Director of Agriculture, Kundasale,the seeds given by 82 farmers were not multiplied and returned back thereto. Details of the vegetable seed variety given to the farmers for cultivation during the season, the class of seeds belonging to that variety, the quantity of seeds given and the quantity of seeds recovered from the farmers at the end of the cultivation are given in Annexure No. 04.

Accordingly, it was observed that at the purchase of seeds from farmers under the Contract Seed Production Program, it was focused only on the purchase of bean seeds. It was not focused sufficiently to purchase the quantity that could not be produced by the Government Seed Farm in an economical manner based on the relevant criteria.

3.5.5 Emphasis on the Need for a Database

Seeds purchased under the Contract Seed Production Program and seeds produced by the farms belonging to the Seed and Planting Material Centre are processed by the Kundasale Seeds Processing Centre and handed over to the Vegetable Seed Store. Seeds are sold through these seed outlets as well as by the private sector. Future seeds production programs will be required to obtain prompt information on the sale of vegetable seeds categories sold by outlets. It took a long time to get the data related to the above areas required for this audit, and the data on sales in seed outlets could not be obtained till 10, June 2020. Although the Department of Agriculture is primarily responsible for the production and supply of seeds for vegetable cultivation, it is highlighted that the need for a computerized information system to obtain the required data expeditiously was not established.

3.6 Maintaining Seed Stocks

The time period of the seeds storable in quality depends on the moisture content, temperature and humidity before storing the seeds. Accordingly, the storage temperature for vegetables and supplementary crops is 15 degrees Celsius and the humidity is 40 percent. The Seed Certification and Plant Protection Centre estimate that the maximum storage life of seeds is 2-5 years. Accordingly, it is advisable to use polysack packaging for short term storage of seeds, triple aluminum packaging and polysex packaging with polythene bags for medium seed packaging and triple aluminium packaging for long term seed packaging. Good ventilation when storing seeds, keeping the store clean without diseases and pests, storing seeds not contacted with the floor and walls, maintaining roof and walls to prevent rain water leakage, and maintaining low temperature and dry

conditions directly affect to the quality of seeds. But it was not considered in the followings some cases.

3.6.1 Gannoruwa Main Vegetable Seed Store

Seeds produced should be stored securely in accordance with the prescribed standards to provide farmers with quality seeds required for cultivation. The following observations were made during the inspection of seed stores at Gannoruwa and Kundasale belonging to the Seed and Planting Material Center.

(a) The Gannoruwa Seed Depot, built before 1977, has a volume of 119 cubic meters and its storage capacity is approximately 30,000 Kgs. Rejected seeds were stored in a warehouse. As at 31 December 2018, 32,295 kg of seeds belonging to the basic, breeder, standard and commercial seed classes had been stored in these warehouses and 44,375 kg of seeds belonging to those classes had been stored as at 1st December 2019. It was observed that keeping a large number of seeds in the warehouse beyond the storage capacity adversely affects the quality of the seeds.


(b) It is observed that seeds belonging to different classes of seeds were stored in the same premises due to insufficient storage facilities. However, the seeds can be identified by the description was given on the label and they were stored in such a way that the seeds of different classes could be mixed in case of any change.

(c) Due to the insufficient space in Gannoruwa Main Vegetable Seed Storage, it can be observed that seeds are stored in 02 container boxes on the right side entrance of the office and at the office premises. Even though quality seeds were stored in one container box, expired seeds were stored in another container near thereof.

(d) The Department of Agriculture also produces basic seeds by Government farms and standard seeds under Government contract seed program, government farm and private institutions. The role of the Seed and Planting Material Center is to release these seeds as required which are produced at a high cost. The vegetable seeds produced during the period from 2014 to 2019 which were approximately 15,000 kilograms and valued at Rs. 38,338,200, were to be disposed of due to

the weak germination. Accordingly, it was observed that management should pay attention on accurately predicting seed production targets, producing and releasing seeds as required.

(e) Standard seeds belonging to 08 varieties of vegetables produced of 13556 kg under the Government Seed Production Farm and Contract Seed Production Program were received by the Gannoruwa Main Vegetable Store in the year 2018 and the quantity of seeds issued for cultivation during the year was 10,867 kilograms. Details are below.

Vegetable variety	**Receipts**	**Issues**	**Balance as at 31st December 2018**
Tomatoes	66	195	1343
Okra	2480	1593	2014
Bitter gourd	929	874	4390
Long beans	1287	2507	2322
Wing bean	421	711	3134
Cucumber	158	3	727
Pumpkin	182	133	50
Beans	8033	4851	13567
Total	**13,556**	**10,867**	**27552**

Source - Vegetable Seed Center (Department of Agriculture)

(i) According to the above information, 8033 kg of bean seeds were received in storage in the year 2018 and 4,851 kg of seeds were issued during the year. The stock of bean seeds in store was 13,568 kilograms as at 31st December 2018. It was observed that the quantity of seeds purchased was very high as compared to the sale of bean seeds and the representation of bean seeds in the stock of expired seeds was very high.

(ii) In the year 2018, 66.8 kilograms of standard tomato seeds belonging to Rashmi, Thilina, Bathiya, Maheshi and KCI varieties were received to stores and 195 kilogrames of seeds were issued. Sometimes the tomatoes are wasted because of the large harvest. Therefore, the Institute of Industrial Technology has conducted research on the potential of producing tomato pulp (tomato sauce) using tomato varieties introduced by the Department of Agriculture and identified the tomato variety "Tharidhu" as the most suitable variety for tomato sauce pulp. Although the Institute of Industrial Technology had recommended that the varieties have to be further developed, no production or issue of "Tharidhu" tomato seeds had taken place in 2018.

(iii) Due to the large harvest of pumpkins in the year 2018, the farmers who could not sell them were in great difficulty. The farmers had resorted to cultivate a large number of imported pumpkin seeds but during the year it was observed that the variety of standard pumpkin seed "Pathma" production, issue and seeds quantity in store were at minimum level.

(g) Although the minimum quantity required for each type of seed is specified in order to provide quality seeds required by the farmers for cultivation in Sri Lanka, the minimum stock required for 10 varieties has not been maintained at minimum stock level as at 31 December 2018. Details are below.

Seed type	Minimum seed quantity to be maintained	Quantity of seeds stored as at 31.12.2018	Deficit period
Bean T.C.	300	0	03 Years
Brinjal Padagoda	150	0	01 ½ Years
Brinjal S.M 164	200	0	
Luffa L A 33	300	0	
Brinjal Thinnaweli	100	0	
Okra MI5	300	127.850	
Snake gourd TA2	500	51.700	
Cucumber LY58	150	0	
Okra MI7	200	0	
Bitter Gourd Thinnaweli	100	5.400	
Snake gourd Thinnaweli	100	0	02 Years
Brinjal Amanda (Hybrid)	25	8.700	
Brinjal Lenairi (Hybrid)	25	0	
Bean Sanjaya	200	0	01 Year

Source - Vegetable Seed Centre (Department of Agriculture)

Although the minimum quantity of seeds required for 4 varieties was 925kg, it was observed that the quantity of seeds in storage was 193.650kg as at 31 December 2018.

(h) The Seed and Planting Material Centre had suspended the sale of seeds in 2018 due to changes in the distinctive features of the Winged bean-Krishna and Tomato-Thilini varieties sold for cultivation by those outlets. 373kg of seeds worth Rs.7,530,037 belonging to the Krishna-Winged bean and Tomato-Thilina varieties had been stored as at 01 December 2019.

Seed stock as at 2019.12.01

Seeds type	Basic Seed kg	Standard Seed kg	Breeder Seed kg	Total kg	Price per 1 kg
Winged bean-Krishna	6.860	-	37.790	44.650	3,000
Tomatoes -Thilini	135.055	192.850	0.810	328.715	22,500

(i) Although the Seed and Planting Material Center has requested a minimum quantity of breeder seeds from the Horticultural Crops Research and Development Institute, the vegetable seed center should maintain a minimum stock of beans (Sanjaya), bitter gourd (Tirunaveli) at 200kg and 150kg respectively. There were no stocks of beans and brinjal seeds and only 5.4kg of bitter gourd remained as at 31 December 2018.

(j) The following are the details of the stocks held as at 01 December 2019 in the main vegetable seed warehouse of the Seed and Planting Material Center in respect of 14 vegetable varieties introduced by the Horticultural Crops Research and Development Institute.

Following are the audit observations in this regard.

(i) The Gannoruwa Seed Store does not have any quantity of seeds pertaining to the basic, breeding and standard seed classes of the vegetable cultivar (Healthy F1 Hybrid) introduced as a result of long term research conducted by the Horticultural Crops Research and Development Institute; brinjal (Hordi Lenair) standard seeds were found to contain only a small amount of 25 kg.

Therefore, it is observed that there is no definite program to produce and distribute this variety among the growers.

(ii) According to the information on breeder seeds held at Gannoruwa Main Vegetable Seed Depot belonging to the Seed and Planting Material Center as at 01 December 2019, breeder stock for 65 vegetable varieties range between the maximum stock of 216kg and the minimum stock of 15g. The minimum stock to be maintained in the seed store was not determined for those seed varieties and the breeder seed quantity of the following 17 vegetable varieties were less than 01 kg.

Seed type	Seed Variety	Seed Stock as at 01 December 2019 (g)
Capsicum	L.Y.W.	570
Luffa	Asiri	105
Long beans	Havari	970
Bushita	B.S. 1	800
Okra	M.I. 5	350
Snake gourd	Thinnaveli	260
Spinach	Yodha	20
Tomato	T. 146	315
Tomato	Thilina	810
Tomato	K.C. – 1	915
Tomato	Ravi	600
Tomato	Rashmi	775
Tomato	Lanka shower	475
Winged bean	S. L. S. 44	50
Okra	OK – 2	150
Capsicum	Prarthana Hyw.F1	0.015
Pumpkin	Padma	0.710

Source - Vegetable Seed Center - Department of Agriculture

3.6.2 Government Seed Storage at Kundasale

(a) Kundasale seed storage built in the year 2004 in the premises of the Government Seed Production Farm has a volume of 225 cubic meters and the approximately 40,000kg of seeds can be stored. However, the quantity of seeds that can be stored may vary depending on the type of seed being stored. The amount of seeds stored as at 31st December 2018 was 29,726 kg and 30,785 kg was as on 1st December 2019. 74 per cent of the standard seeds for 16 types of vegetables in the seed store represented the seeds of two types of vegetables as of 01 December 2019. The details are as follows.

Serial Number	Vegetable type	Quantity Kg	Percentage
i.	Beans	15,318.700	49.76
ii.	Long beans	7,412.700	24.08
iii.	Okra	2,812.775	9.14
iv.	Bitter gourd	1,763.200	5.73
v.	Cowpea	1,007.700	3.27
vi.	Radish	848.200	2.76
vii.	Winged bean	438.700	1.43
viii.	Spinach	355.400	1.15
ix.	Snake gourd	337.300	1.10
x.	Thampala	140.690	0.46
xi.	Batu	93.300	0.30
xii.	Cucumbers	81.950	0.27
xiii.	Honey melon	70.300	0.23
xiv.	Capsicum	50.000	0.16
xv.	Tomato-Thilini	33.600	0.11
xvi.	Thibbatu -Bindu	20.800	0.07
		30,785.315	

Source - Vegetable Seed Center (Department of Agriculture)

(b) The following observations were made regarding the stock condition of the Government Seed Depot in Kundasale as at 31 December 2019.

(i) The stock of bean seeds was 50 per cent of the total standard seed stock in the stores as at 01 December 2019.

(ii) The seeds of the varieties such as Long beans, bitter gourd and snake gourd which are more than 5 years old, were 3,783g out of the stock of standard seeds in the warehouse, and it was observed that the said stock represents 12 per cent of the total seed stock.

(iii) It was observed that the seed stock level of 5 vegetable types was less than 100 kg due to the inability of the production programs to achieve the desired vegetable seed production targets.

(iv) During seed storage, it was observed that the seeds were stored in such a way that they were not well ventilated and collided with the walls. In addition, it was observed that expired seeds were still in stores at physical examination carried out on 23 December 2019.

(v) There were 609.9kg of expired bitter gourd seeds in the Kundasale Seed Stores and the value as per the price in the year 2018 was Rs.3,354,450 thereof. Although it was stated that the stock of seeds had been given for a research purpose, it was observed that the stock of seeds had been stored along with the stock of live seeds as it had not been removed from the store premises.

In a good stock control system, the minimum stock levels to be maintained should be determined and the required stock quantities should be maintained, the relevant stocks should be used before the expiration date and the expired seeds should be separated from the stock of seeds that can be used for cultivation and placed elsewhere. However, according to the above observations, that the stock control of the Kundasale seed warehouse was in poor condition.

3.7 Sales of Seeds

3.7.1 Determination of Seed Prices

The vegetable seeds sold by the outlets owned by the Seed and Plant Material Development Center consist of vegetable seeds produced in the Government Seed Production Farm and seeds purchased under contract seed programs. The selling price of these seeds is determined by the Pricing Committee of the Department of Agriculture, which adds a percentage of the profit to the cost of seed production or purchase. It is observed that not only profit but also socio-economic impact is taken into consideration in determining the price of seeds. The private institutions sell local seeds as well as imported seeds and it was observed that no price was prescribed thereto.

3.7.2 Selling seeds through seed outlets belonging to the Seed and Planting Material Center

(a) The Seed and Planting Material Center of the Department of Agriculture produces seeds through its own seed farms as well as the contract program and sells the seeds through 30 seed and planting material outlets including the Gannoruwa Vegetable Seed Center. The details of seed sales are given below.

Months	**Seed sales revenue**		
		Rs.	
	2017	**2018**	**2019**
January	6,914,396	5,397,696	5,928,669
February	5,055,952	2,860,729	4,319,827
March	5,409,303	7,729,935	5,444,467
April	2,428,986	3,450,199	4,489,528
May	3,540,110	3,333,740	5,096,566
June	3,112,632	436,352	5,607,677
July	3,405,144	2,751,426	4,685,399
August	5,865,924	5,728,412	6,001,679
September	17,156,780	5,236,821	5,472,514
October	14,328,965	11,316,323	6,127,608
November	6,227,246	8,260,611	5,623,303
December	5,832,785	16,248,750	1,531,916
The income to be collected according to the answer on 10/6/2020			2,069,620
Total	**79,278,223**	**76,680,996**	**62,398,777**

Source - Vegetable Seed Centre (Department of Agriculture)

These data are further analysed in Annexure 5 and the relevant observations are as follows.

The total seed sales revenue of the Gannoruwa Main Vegetable Seed Store associated sales outlet from the year 2017 to 2019 declines gradually as Rs. 79,278,223, Rs. 76,680,996 and Rs.62,398,777 respectively, while seed sales revenue in 2019 was down 21 per cent compared to 2017. The Department of Agriculture had not reported the reasons for this to the audit.

(b) Problems of farmers in purchasing local seeds

(i) According to the information obtained from the farmers who come to the Dambulla and Thambuththegama Economic Centers to sell vegetables, it was stated that the local seeds were not available at the market when required to purchase for cultivation activities.

(ii) According to the information obtained from the Agrarian Service Centers, it was stated that seeds could not be provided to the farmers at the beginning of the cultivation season due to the inability to purchase seeds when required.

(iii) In the letter submitted to the Badulla District Secretary by the Badulla District Agrarian Federation on 18 July 2017, it was proposed to provide local seeds to the farmer organizations to protect the endangered local varieties. Thus, it is observed that there is a high demand for local seeds from farmers.

3.7.3 Seed Marketing Process by Agrarian Service Centers

Information on the mechanism of distribution of these vegetable seeds through Agrarian Service Centers, the nearest government agencies dealing with farmers, was obtained from 15 Agrarian Service Centers islandwide on the purchase of seeds from 2017 to 2019.

The following observations were made in this regard.

(a) Only 04 out of 15 Agrarian Centers had purchased seeds worth Rs. 188,240, Rs. 227,732 and Rs.79,205 and remaining 11 centers had purchased seeds worth Rs. 1,126,106, Rs. 1,234,375 and Rs. 1,045,344 from private sector institutions respectively.

(b) It was observed that the Agrarian Service Centers are consider the facilities provided by the Seed Marketing Institutions when purchasing vegetable seeds. It was observed that some of the facilities provided by external agencies were not provided by government agencies and they were tempted to purchase seeds from outside agencies.

The facilities provided by external agencies are as follows.

- Providing seeds on loan basis.
- Re-acquisition of unsold and expired seeds
- Transporting seeds to Agrarian Service Centers.
- Providing seeds when required.
- Offering discounts on purchase of seeds.
- Seed germination is not in poor condition.

The Agrarian Services Center had reported to the audit that these facilities were not provided for seeds distributed by the Seed and Planting Material Center of the Department of Agriculture, so market surveys did not identify problems and address the necessary remedies.

3.7.4 Purchase of Seeds for Programs from the Extension and Training Division

In purchasing seeds for seed distribution programs implemented by the project and Training Division of the Department of Agriculture, in 2017 and 2019, number of 3 seed varieties such as capsicum, winged beans and okra seeds of 65.3 kilograms had been purchased at Rs.27, 800 from private outlets

3.7.5 Reasons identified by the Department of Agriculture for not being popular local seeds among farmers

According to the letter dated 13 February 2020 No. A.D/2/29/A of Director General of Agriculture the following are the reasons for the non-popularity of local seeds among the farmers. Accordingly, it had not been focused to initiate a suitable long-term program to address these issues.

(a) To organize seed production programs and determine the quantity of seeds purchased based on the annual allocation.

(b) Lack of suitable places to set up shops covering Jaffna and Ratnapura districts. At present, there are 34 outlets island wide that have difficulty in distributing seeds in the proper season due to lack of adequate outlets, transport facilities, and officers for marketing promotion.

(c) Existence of more demand for the imported hybrid seeds with quantitatively higher yields than for high-quality local seed varieties and to provide attractive packages through the private sector for them.

(d) Lack of adequate cool and general storage facilities.

(e) Inability to produce and process seeds for the season due to shortage of manpower and machinery for the farms.

(f) Low priority given to the sale of seeds by the Department of Agriculture due to higher discount given by the private sector and the high preference for the sale of seeds produced by the private sector through their outlets although Agrarian Service Centers have been set up throughout the country.

(g) Inadequate awareness of farmers about local seeds.

(h) Inadequacy of existing mobile service vehicles.

(i) Reduction in the number of training of field demonstrations conducted for encouraging farmers in vegetable cultivation on the basis of allocated provisions, and decline in the inclination to promote vegetable cultivation under projects and reduction of implementation of free seed distribution programs.

(j) Lack of supply of seeds for the required period and quantity and reduction of germination percentage due to problems in storage and processing at the village level and in local varieties.

(k) Decrease in contribution of the private sector to produce the seeds of local hybrid vegetable varieties made by the Department of Agriculture.

04. Recommendations

(a) To take necessary action to minimize the cost of supplying those seeds to the farmers after confirming the appropriate seed tests in accordance with the Government Seed Policy, in consultation with the Private Sector.

(b) The Seed Production Material Center should prepare a seed production program based on the season of cultivation to supply sufficient seeds to meet the needs of the country. Action should be taken to reduce the variations by campaing the seed production programme with actual information.

(c) To conduct research on local seeds for the frequent use of local seeds for vegetable cultivation in Sri Lanka, to formulate a methodology for obtaining information on farmers' seed requirements, to conduct research related to the introduction of local vegetable seeds that can compete with imported seeds, and to establish proper coordination among the institutions under the Department of Agriculture in order to provide seeds introduced through research results to the farmers.

(d) After identifying problematic seed varieties, to develop and to implement a specific methodology for resolving those problems by the Horticultural Crops Research and Development Center, to identify potential seed varieties, to develop and to improve varieties for vegetables such as carrots which are in high consumer demand and to provide them to farmers.

(e) To determine and to manage seed stock levels to maintain minimum safe seed stocks as required by the Seed and Planting Material Center.

(f) To develop the unused land area in the 27 seed production farms belonging to the Seed and Planting Material Center and to use it for seed production and to prepare the necessary methods in order to solve the existing water problem in the farms.

(g) To improve the quality of the existing stores for storage of seeds and planting material to the required standards and to take steps in order to increase the storage capacity and to improve the required cool storage facilities.

(h) To maintain long term skilled labor required for the maintenance of seed farms, to formulate and implement a program to solve the water problem.

(i) Expansion and modernization of existing facilities to increase efficiency in seed farms.

(j) Preparation of an extensive program to involve government agencies including Agrarian Service Centers in addition to the outlets at the Seed and Planting Material Center for the sale of seeds.

(k) To provide necessary facilities to the farmers who produce seeds on contract basis under the contract seed production program with proper supervision. (To encourage seed production in safe houses.)

(l) To provide physical facilities required to maintain the seed certification process conducted by the Seed Certification and Plant Conservation Center for confirming the quality of the seeds.

Sgd./W.P.C. Wickramaratne
Auditor General

W.P.C.Wickramaratne
Auditor General
01 February 2021

Annex 01

New vegetable varieties introduced by the Horticultural crops Research and Development center

vegetable	variety	Introduced year	Yield per hectare (Tons)
Tomato	Hordi Tomato- hybrid 03	2019	53
Beans	PB 161 (Keklu)	2017	23-25
	Gannoruwa bill	2013	30
	Hordi Green	2012	28
	Bandarawela Green	2012	18-20
Pumpkin	Padma	2016	15-20
Capsicum	F1 Prarthana	2015	20-25
Bitter guard (healthy)	F1 Hybrid	2015	15-20
Long beans	A(9)-Gannoruwa	2015	21-24
	Gannoruwa -Hawari	2012	35
Cucumber	HORDI Green HORDI White	2012 2013	40-45
Thampala	HORDI Thampala	2013	25
Luffa	Gannoruwa Ari	2013	30
Brinjal	Hordi Lenairi	2011	35-40
Okra	OKH-1-F	2011	30
Carrot	Lanka Carrot	2011	30-35

Annex 02

Details of seeds rejected due to health failure under contract seed production program

Year 2019

Office of the Deputy Director of Agriculture	Rejected seed type	Quantity of Rejected seed (kg)
Kundasale	Tomato	8
Bean seeds Production unit - Rikillagaswewa	Tomato	3
Kundasale	Tomato	3
Kundasale	Tomato	1.8
Bean seeds Production unit - Rikillagaswewa	Tomato	10.1
Bean seeds Production unit - Rikillagaswewa	Tomato	2.7
Bean seeds Production unit - Rikillagaswewa	Tomato	14.3

Year 2018

Office of the Deputy Director of Agriculture	Rejected seed type	Quantity of Rejected seed (kg)
Kundasale	Tomato	5
Kundasale	Tomato	6
Kundasale	Tomato	5
Bean seeds Production unit - Rikillagaswewa	Tomato	5
Kundasale	Tomato	2
Bean seeds Production unit - Rikillagaswewa	Tomato	3
Kundasale	Tomato	5
Bean seeds Production unit - Rikillagaswewa	Tomato	2
Bean seeds Production unit - Rikillagaswewa	Tomato	8
Kundasale	Tomato	7
Kundasale	Tomato	3
Bean seeds Production unit - Rikillagaswewa	Tomato	2
Kundasale	Tomato	3
Kundasale	Tomato	9
Kundasale	Tomato	7

Source – Seed Certification Service- Gannoruw

Annex 03

Vegetable seed production information – Seed Production Farm Kundasale (From 2016 Yala season to 2018/2019 Maha season

Vegetable Type	variety	No of seasons of seed production	Expected total seeds Quantity(kg)	Quantity of seeds produced (kg)	Percentage
Hybrid seeds					
Brinjal	Hordi Lena iri	2016/2017 - 2018/2019 Cultivation season 5	75	10	13
Tomato	Bathiya/Maheshi/Ravi	2016 Yala- 2018 Yala Cultivation season	36	13.7	38
Bitter gourd	Hordi/MI5/Niroga	2016 Yala - 2017 Yala Cultivation season 3	60	13.2	22
cucumber	Gannoruwa green	2016/2017 Maha season	24	-	0
Basic seeds					
Beans	TC/kakulu	2016/2017 Maha - 2018/2019 Maha Cultivation season 3	780	39	5
Bitter gourd	Matale green	2017 Yala - 2018/2019 Maha Cultivation season 3	660	549	83
Bushitawo	BS-1	2017 Yala	300	-	0
cucumber	Gannoruwa green	2017 Yala	24	0.9	4
Tomato	Thilina/Lanka/Cherry/ Ragitha	2017 Yala - 2018 Tala Cultivation season 5	79	73.6	93
Brinjal	Padagoda	2016/2017 Maha - 2018 Yala Cultivation season 3	135	-	0
Snake gourd	TA-2	2016 Yala - 2018 Yala Cultivation season 5	555	253	45

Standard seeds					
Beans	TC/Bandarawela Nil /WET	2016/2017 Maha - 2018/2019 Maha Cultivation season 2	440	-	0
Bitter guard	MC-43/ Matale green	2016/2017 Maha - 2018 Yala Cultivation season 4	1120	584	52
cucumber	LY58	2016/2017 Maha 2018/2019 Maha Cultivation season 3	360	-	0
Luffa	Gannoruwa Ari	2016 Yala - 2016/2017 Maha Cultivation season 2	480	83.8	17
Okra	MI5	2017/2018 Maha season	600	119.8	20
Tomato	Rajitha/Rashmi/ Thilina	2016 Yala - 2018/2019 Maha Cultivation season 6	600	491.7	82
Brinjal	SM164/Padagoda	2016 Yala - 2018/2019 Maha Cultivation season 3	450	203.7	45
Snake gourd	TA2	2017 Yala 2018/2019 Maha Cultivation season 4	1200	403.4	34

Annex 04

Details of seed quantity given to farmers under contract seed production program and seed recovered after multiplication

Crop	variety	No of farmers who provided seeds	Quantity of seeds given (kg)	Quantity of seeds obtained from farmers	Value	Seed class
Snake gourd	TA – 2	04	2400	-	-	Standard
	TA – 2	01	600	-	-	Basic
Tomato	Lanka power	07	175	-	-	Standard
	Rashmi	09	315	-	-	Standard
Capsicum	CA 8	05	500	-	-	Standard
Winged bean	SLS 44	04	3.6	-	-	Basic

Contract vegetable seed production during the 2017/2018 Maha seasons

Crop	variety	Seed class	No of farmers who provided seeds	No of farmers who returned seeds	Quantity of seeds (kg)given to farmers	Quantity of seeds returned by farmers(kg)
Bitter gourd	Matale	Basic	13	05	11.8	141.86
	green	Basic		-		-
Winged bean	SLS 44	Basic	02	-	3.2	-
Snake gourd	TA 2	Basic	01	-	1.6	-
Capsicum	CA 8	Basic	02	-	-	-
Beans	Sanjaya	Basic	03	-	15	-

Contract seeds program – 2018 Yala seasons

Crop	variety	Seed class	No of farmers who provided seeds	No of farmers who returned seeds	Quantity of seeds returned (g)	Value
						Rs.
Capsicum	CA 8	Basic	07	-	-	-
Snake gourd	TA 2	Basic	06	01	10200g	25,500
Long beans	A9	Basic	05	03	21600g	89,960
Tomato	Thilika	Basic	11	01	1100g	14,850
	Rashmi	Basic	11	-	-	-
	Lanka power	Basic	11	-	-	-
Capscicum		Basic	02	-	-	-

Maha season 2018/2019

Crop	variety	Seed class	No of farmers who provided seeds	Quantity of seeds returned (g)	No of farmers who returned seeds	Quantity of seeds recovered (g)	Value Rs.
Tomato	Lanka power	Basic	01	30g	-	-	-
Capsicum	CA 8	Basic	02	50g	-	-	-
Okra	MI7	Basic	01	450g	-	-	-
Luffa	LA33	Basic	09	2700g	06	123500 g	-
Long beans	A9	Basic	01	1500g	-	-	-

Maha season - 2018/2019 (second step)

Crop	variety	Seed class	No of farmers who provided seeds	Quantity of seeds returned (g)	No of farmers who returned seeds	Quantity of seeds recovered (g)	Value
							Rs.
Capsicum	CA 8	Basic	01	20g	01	7300g	56,940
Bitter gourd	ML7	Basic	07	3600g	-	-	-
Ma	A9	Basic	01	1500g	01	25900g	67340
Tomato	Thilina	Basic	35g	-	-	-	-

Yala season 2019

Crop	variety	Seeds class	No of farmers who provided seeds	Quantity of seeds returned (g)	No of farmers who returned seeds	Quantity of seeds recovered (g)	Value Rs.
Luffa	LA33	Basic	02	1200g	-	-	-
Winged beans	SLS 44	Basic	03	4200g	-	-	-
Long Beans	A9	Basic	02	3000g	-	-	-
Tomato	Lanka power	Basic	03	90g	02	6700 g	86,930

Source - Office of the Deputy Director of Agriculture - Kundasale

Annex 05

Details of the income earned from the sales of the seeds by the store at Gannoruwa vegetable seed center for the period 2017 to 2018 are as follows.

Month	2017			2018			2019		
	Cash Income Rs.	Revenue on issuance order Rs.	Total Rs.	Cash Income Rs.	Revenue on issuance order Rs.	Total Rs.	Cash Income Rs.	Revenue on issuance order Rs.	Total Rs.
January	4,280,129	2,634,267	6,914,396	2,257,135	3,140,561	5,397,696	3,215,694	2,712,975	5,928,669
February	3,344,679	1,711,273	5,055,952	832,186	2,028,543	2,860,729	2,191,301	2,128,526	4,319,827
March	1,364,321	4,044,982	5,409,303	1,745,893	5,984,042	7,729,935	2,460,178	2,984,288	5,444,467
April	973,277	1,455,709	2,428,986	1,075,906	2,374,293	3,450,199	1,746,435	2,743,094	4,489,529
May	879,114	2,660,996	3,540,110	1,307,500	2,026,240	3,333,740	1,526,182	3,570,384	5,095,566
June	1,030,691	2,081,941	3,112,632	2,167,254	2,199,098	4,366,352	3,070,132	2,537,545	5,607,677
July	1,349,507	2,055,637	3,405,144	931,920	1,819,505	2,751,426	1,538,978	3,146,421	4,685,399
August	2,794,806	3,071,118	5,865,924	2,000,367	3,728,045	5,728,412	1,489,796	4,511,883	6,001,679
September	1,936,928	15,219,852	17,156,780	1,511,088	3,725,733	5,236,821	1,195,975	4,276,539	5,472,514
October	3,741,141	10,587,824	14,328,965	4,856,331	6,459,992	11,316,323	2,672,438	3,455,170	6,127,608
November	1,837,368	4,389,878	6,227,246	3,671,632	4,588,978	8,260,611	1,413,724	4,209,580	5,623,304
December	2,721,872	3,110,913	5,832,785	8,740,434	7,508,316	16,248,750	1,531,916	-	1,531,916
Total	26,253,833	53,024,390	79,278,223	31,097,646	45,583,346	76,680,994	24,052,752	36,276,405	60,329,155