

National Agriculture Research System in Sri Lanka

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National Agriculture Research System (NARS) in Sri Lanka is largely under two different ministries

1. Ministry of Agriculture
2. Ministry of Plantation Industries

- ❖ Ministry of Agriculture covers a range of functions and powers related with the domestic non-plantation agricultural sector which includes crops such as Rice, Fruits and Vegetables, Legumes, Other field crops, Spices and ornamental plants. It is mainly responsible in Implementation of policies, plans and programs in respect of agricultural development, Implementation of policies, plans and programs in respect of agricultural production improvement, Agricultural activities including insurance and other agrarian services, Agricultural education, Agriculture research and extension, development of export agricultural crops, Plant Quarantine, Post harvest technology and research, Implementation of policies, plans and programs in respect to agriculture marketing and other related activities in relation to Agriculture and Agrarian development in the country (Fig 1).
- ❖ Ministry of Plantation Industries function as a apex body for the plantation industry which includes crops such as Coconut, Rubber, Sugar cane, Tea, Cashew, Palmyra and Oil palm. Under this ministry, following research institute were established to cater to the research and development needs of the plantation crops.
 - Tea Research Institute
 - Rubber Research Institute
 - Sugar Research Institute
 - Coconut Research Institute (coconut & oil palm)

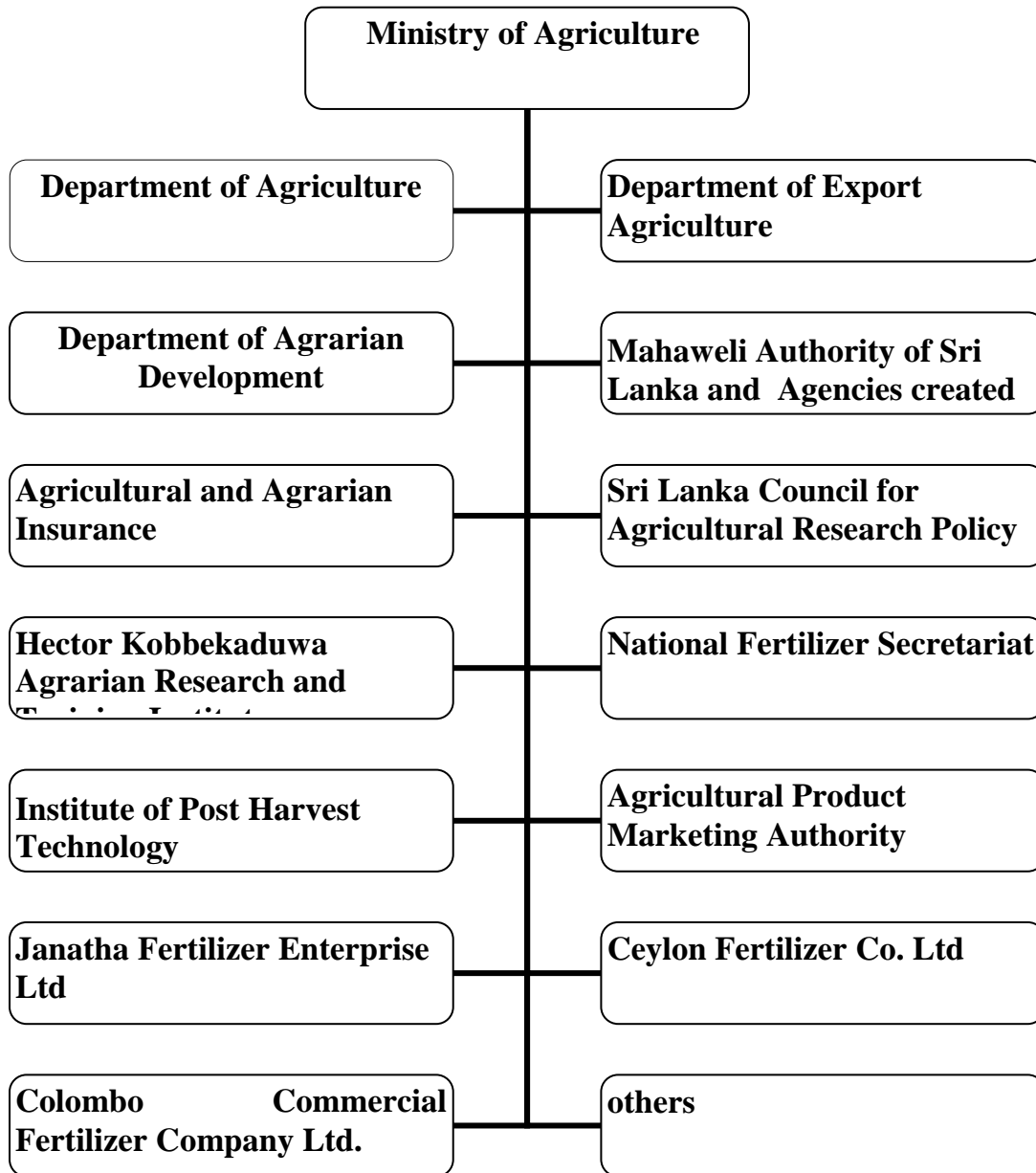


Fig 1. Institutions and Departments under the Ministry of Agricultural

Source: <http://www.gov.lk> 2007-2008

Among the above institutions Sri Lanka Council for Agricultural Research Policy (CARP) functions as the apex body of the agriculture research system.

Sri Lanka Council for Agriculture Research Policy (CARP)

Vision

To develop a vibrant, effective and sustainable system of agricultural research promoting socio-economic development in Sri Lanka

Mission

To strengthen and mobilize research capabilities of the National Agricultural Research System (NARS), Universities, Private Sector and other stakeholders in Partnership in the generation and dissemination of appropriate technologies and information for the development of Agricultural sector

Mandated functions of CARP

- Formulation of a National Agricultural Research Policy
- Organization, Coordination, Planning and execution of agricultural research
- Allocating/generating funds for contract research, monitoring and evaluation, technology dissemination.
- Develop human resources (scientific & Technical) in the agricultural sector
- Foster regional/international linkages to access modern technology, information, exchange of scientific staff, germplasm, etc.
- Disseminate technology and scientific information for agricultural scientists, farmers, private sector and other stakeholders.
- Periodic review performance on agricultural research projects, institutions and divisions
- Repository of scientific information on agriculture and related fields

There are 7 research departments / Institutes under the National Agricultural Research System in Sri Lanka

They are

1. Department of Agriculture (DOA)
2. Department of Export Agriculture (DEA)
3. Hector Kobbakaduwe Agrarian Research Institute (HARTI)
4. Tea Research Institute
5. Coconut Research Institute
6. Sugar Research Institute
7. Rubber Research Institute

Apart from this the Forest Department and the Animal Production and Health which comes under CARP also conduct research programs related to forestry and Animal husbandry.

Country Profile

Total extent	- 65,610 km ²
Total Land extent	- 62,705 km ²
Extent of inland water bodies	- 2905 km ²
Total population	- 20,450,000

Population distribution based on Age

0 – 14 yrs	- 5,378,000
15 – 64 yrs	- 13,784,000
>65yrs	- 1,288,000

Contribution to GDP by various sectors in Sri Lanka

Agriculture plays a vital role in contributing a fair share to the GDP in Sri Lanka. It was around 12% and Agriculture, livestock and fisheries alone covers 10.9%. Highest contributor to GDP in Sri Lanka is services followed by industry (Table 1).

Table 1. Contribution to GDP by different sectors in 2008 and 2009

Sector	Value Rs million		As a share of GDP, %	
	2008	2009	2008	2009
Agriculture	285,897	294,921	12.1	12.0
Agric, livestock & Forestry	258,881	266,033	10.9	10.9
Fisheries	27,016	28,888	1.1	1.2
Industry	672,791	701,129	28.4	28.6
Services	1,406,813	1,453,254	59.5	59.3
GDP	2,365,501	2,449,304	100	100

Within the agriculture crop sector, contribution from paddy sector as a single crop contribute the most followed by coconut and tea sectors. Other field crop sector covers a large number of food crops which accounts to about 3.9% share of the GDP (Table 2). Among these crops, food crops such as Paddy, Other field crops and other agricultural crops are handled by the Department of Agriculture under the Ministry of Agriculture. Minor export crops such as cloves, cardamom, cinnamon, pepper etc are also handled by the Export Crops Department under the Ministry of Agriculture.

Table 2. Sectoral composition of GDP by the agriculture sector in 2009

Sector	Share of GDP %	
	2008	2009
Agriculture	12.1	12.0
Agriculture livestock and Fisheries	10.9	10.9
Rubber	0.2	0.3
Coconut	1.4	1.4
Minor Export Crops	0.4	0.5
Paddy	1.8	1.7
Livestock	0.9	0.9
Other Food Crops	3.8	3.9
Plantation Development	0.3	0.3
Forestry	0.6	0.6
Other Agricultural Crops	0.4	0.4
Tea	1.2	1.0
Fisheries	1.1	1.2

Research and Development of plantation crops such as Tea, Rubber and Coconut which earns a significant foreign exchange and also Sugar R & D are handled by separate institutes under the ministry of plantation industries. Various other institutes such as HARTI, IPHT also conduct research on various aspect of food crops. This suggest that R & D of agriculture crops are handled by many institutions in the country. However all are under the central government system and practically no Agricultural research is decentralized and no research is being done by the provincial government in Sri Lanka.

National Agriculture Research Systems in Sri Lanka

1. Department of Agriculture

Department of Agriculture (DOA) is the largest organization in the agriculture system in Sri Lanka and also have the largest research network well distributed to cater to the research needs of food crops different agro climatic zones of the country.

Vision.

Achieve excellence in agriculture for national prosperity

Mission:

Achieve an equitable and sustainable agriculture development through development and dissemination of improved agriculture technology

Main Functions of the Department of Agriculture:

- Research
- Extension
- Seed and planting material production
- Regulatory services
- Plant quarantine
- Soil conservation
- Registration of pesticides

To carry out the above functions effectively, following *technical institute were assigned with different functions*

1. Rice Research and Development Institute (RRDI)
2. Horticulture Research & Development Institute (HORDI)
3. Natural Research Management Center (NRMC)
4. Field Crop Research & Development Institute (FCRDI)
5. Seed Certification and Plant Protection Center (SCPPC)
6. Seed and Planting Materials Development Center (SPMDC)
7. Socio-Economics and Planning Center (SEPC)
8. Extension and Training Center (ETC)

The three crop research institutes, namely RRDI, HORDI, and FCRDI are responsible in developing technologies for the improvement of food crops and also responsible for the primary dissemination of proven technologies. SCPPC and SPMDC carryout mainly service functions.

ETC is assigned with the transfer of technologies to the end user and training aspects. NRMC is responsible in research and regulatory functions with regard to natural resources

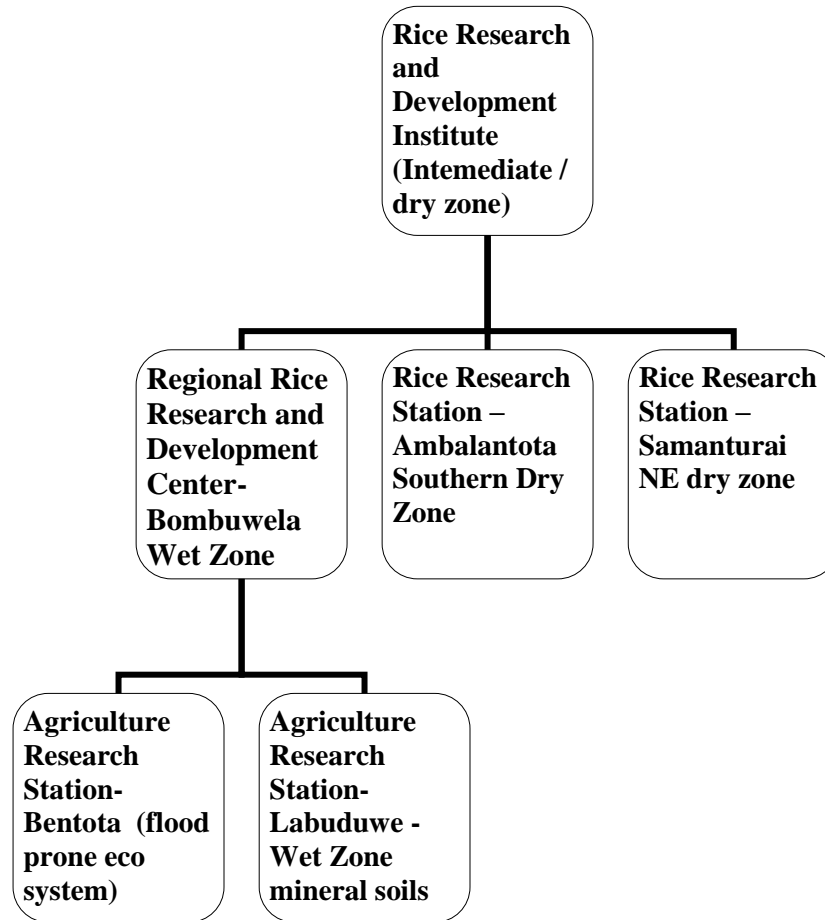
Table 3. Vision and Mission of different research institutes/centers under the DOA

Institute	Vision	Mission
RRDI	National prosperity through excellence in rice production.	To be the national center for the development and dissemination of technologies to improve the productivity and profitability of rice farming and quality of rice.
FCRDI	Achieve national prosperity through excellence in field crops sector	To achieve economic revitalization of the farmers in the field crops sector and to assure national food security through generation and facilitating the dissemination of technology necessary for priority field crops to cater for sustainable field crops production in Sri Lanka.
HORDI	Achieve excellence through development of horticultural crops for prosperity of the nation.	Function as the national centre for research and development of sustainable and productive technologies for horticultural crops to ensure economic and social development of the farmers, and other stakeholders.
NRMC	National prosperity through sustainable management of soil and water resources.	To optimize soil and water resources use on scientific basis to improve the agricultural productivity in a sustainable manner while maintaining food security and improved livelihood of the people of Sri Lanka

1. Rice Research and Development Institute,

As mandated this institute has research institutes established in all major climatic zones and has links with all other crop research institutes and faculties of Agriculture of the university system.

Organizational Structure of Rice Research and Development Institute



Regional Rice Research and Development Center-Bombuwela

The Regional Agricultural Research and Development Center, Bombuwela and its satellite research stations at Labuduwa and Bentota cater to the needs of the low country wet zone region. This Centre is responsible for developing new rice varieties, technologies and strategies to improve rice production in the Low Country Wet Zone (LCWZ). Main emphasis is to breed medium and short duration high yielding rice varieties and develop varieties resistant to iron toxicity and major pests and diseases prevailing in the region.

Rice Research Station- Labuduwe and Bentota

The Agriculture Research Station, Labuduwa concentrates on producing medium and short age varieties with special reference to red pericarped and samba grain high yielding varieties having either moderate or short plant height, with tolerance to field problems prevailing in the region.

Rice Research Station – Bentota has the responsibility in evaluating several internationally and locally developed rice varieties to select rice varieties adaptable to flood and salinity affected farmer fields in the LCWZ.

Rice Research Station- Ambalanthota

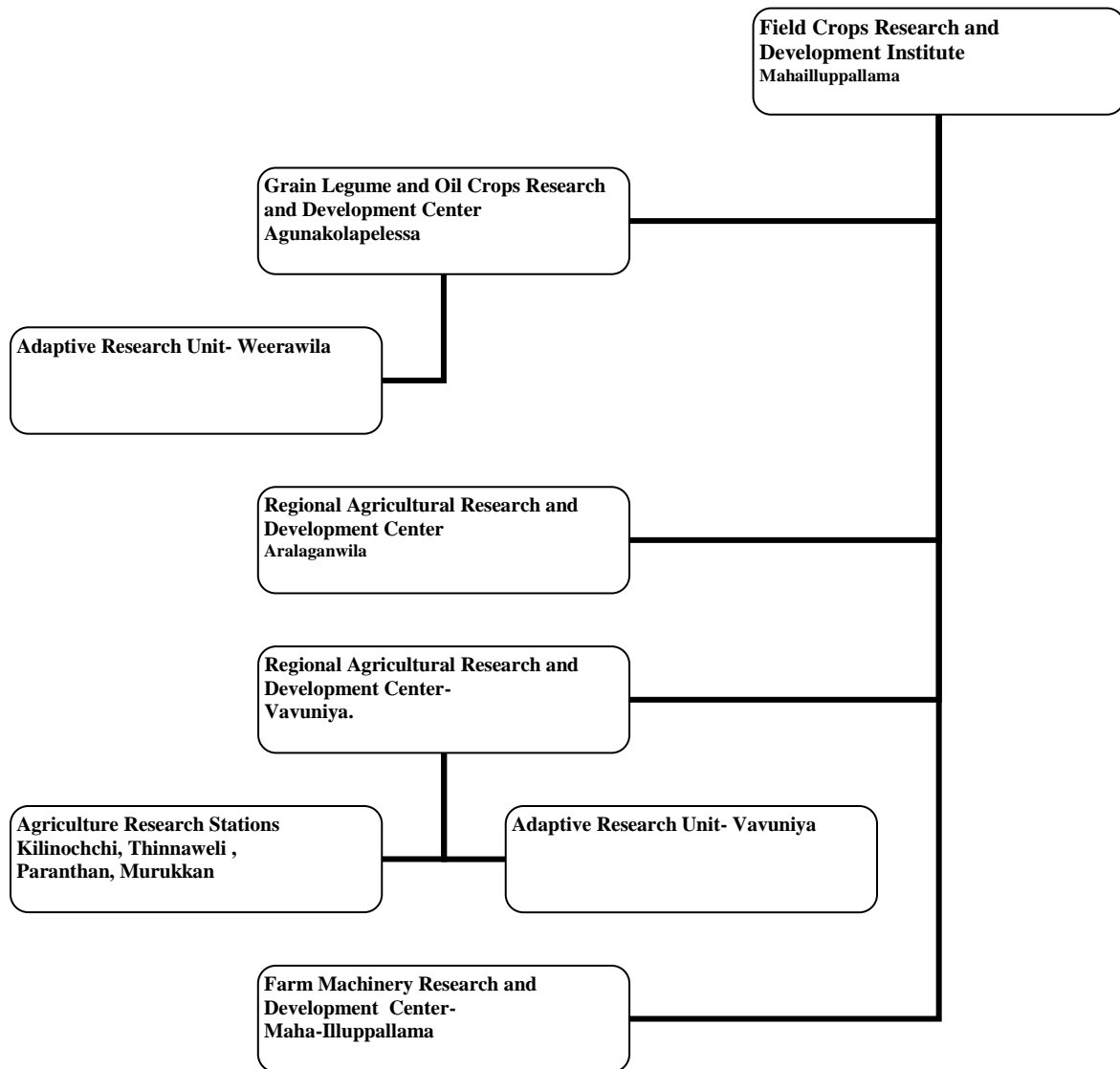
Rice Research Station, Ambalantota holds the responsibility for the development of rice for the southern rice belt. Main objectives of the station are development of improved red pericarped rice varieties and salinity tolerant varieties.

Rice Research Station- Samanthurei

Main objective of this station is to identify knowledge gaps encountered with the rice cultivation in the Eastern Province, especially in the Ampara district and to propose suitable remedial measures.

2. Field Crops Research and Development Institute, Mahailuppallama

Organizational Structure of Field Crops Research and Development Institute



Grain Legume and Oil Crops Research and Development Center, Agunakolapelessa

Be the centre for achieving economic re-vitalization of the farmers in the grain legume and oil crop sector through generation, development and primary dissemination of technology for the southern dry zone

Farm Mechanization Research Centre (FMRC), Mahailupallama

Mission of this institute is develop and promote cost effective, efficient and appropriate agricultural engineering and machinery among stake holders.

Regional Agriculture Research and Development Center- Aralaganwila & Vavuniya

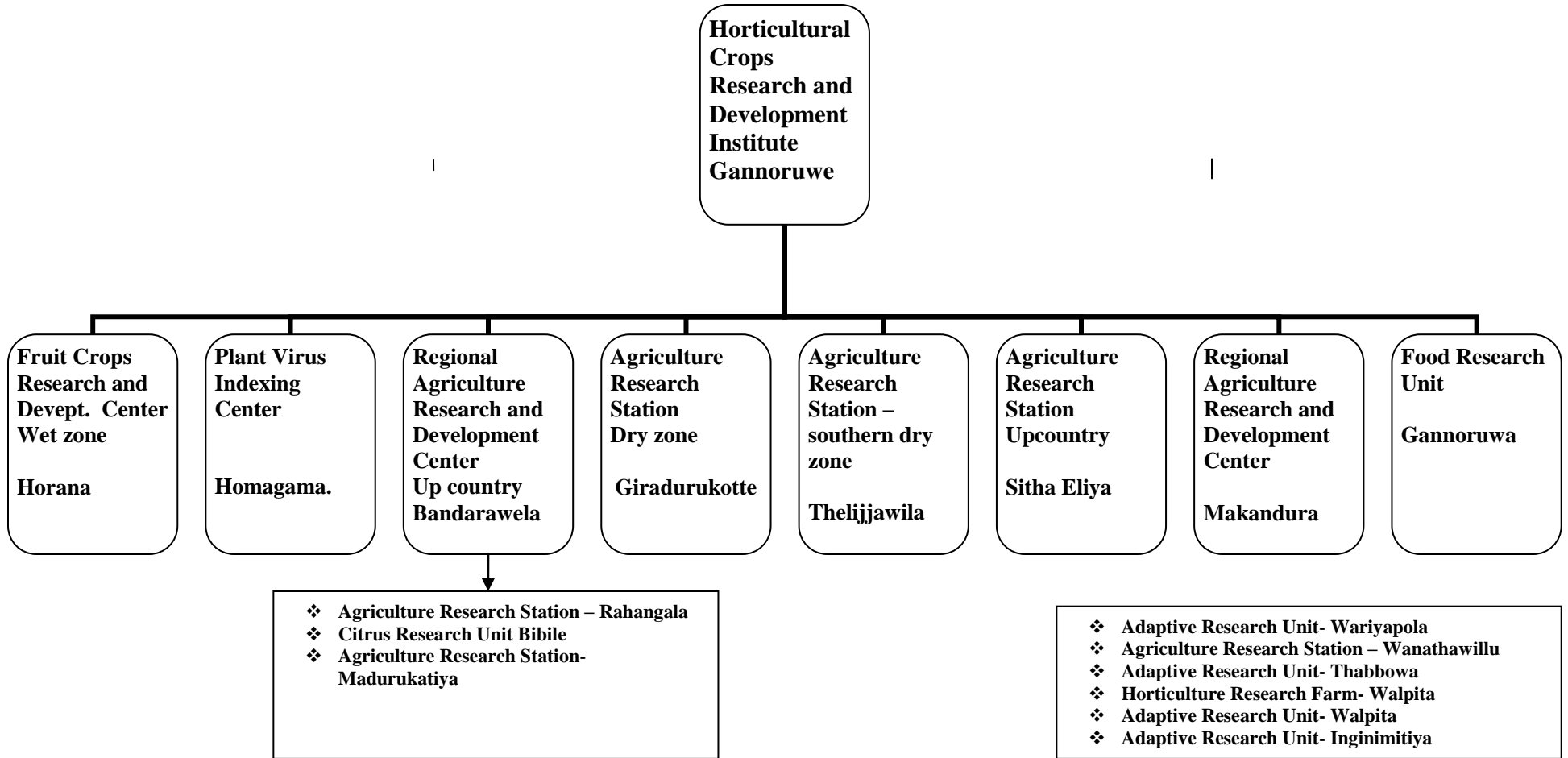
Center for the development of technologies for all food crops for the northern and estern dry zone.

3. Horticultural Crops Research and Development Institute, Gannoruwa,

This institute is responsible in developing technologies and primary dissemination of mandated horticultural crops for the island. Mandated horticultural crops are:

This institute is the largest agricultural research institute under the department of agriculture which is mandated to covers a wide range of fruit and vegetable crops as well as foliage and flowers.

Organizational chart of HORDI



Regional Agriculture Research and Development Center- Bandarawela

The RARDC, Bandarawela, caters the research and development needs of potato, up country vegetables (beans, carrot, cabbage, beet, tomato, capsicum, radish, leeks etc.), fruits (mandarin, pears, strawberry etc.) and flowers.

Plant Virus Indexing Center- Homagama

Function as the National Centre for plant virological research and utilize modern virus diagnostic techniques to ensure healthy status in plants.

Fruit Crop Research and Development Center- Horana

Conduct fruit crop research for the low country wet zone of Sri Lanka

Agriculture Research Station –Thelijjawila

Responsible to cater to the needs of the farming community in the southern Districts.

Agriculture Research Station- Girandurukotte

Research and development activities on dry zone horticultural crops.

Agriculture Research Station- Sita Eliya

Mainly responsible in quality seed potato production under the national seed potato production programme and perform research and development activities primarily on up country vegetables, fruits and floricultural crops.

Regional Agriculture Research Station- Makandura

Responsible for developing technology for coconut based inter cropping systems with crops such as pineapple, banana, papaya, pomegranate, red onion, capsicum, and sweet potato in the North Western Province, which is situated within the coconut triangle.

Food Research Unit- Gannoruwa

Responsible for research and development on post harvest and processing technologies giving due consideration to food security, quality, nutrition and food safety.

4. Natural Resource Management Center- Peradeniya

Responsible in conducting research on land and land management and function as an agency to oversee soil conservation act.

Non Research Centers

5 Seed Certification and Plant Protection Center (SCPPC)

Mandate of SCPPC is to ensure plant protection, seed quality and the management and conservation of Plant Genetic Resources in Sri Lanka. The center has to ensure high quality locally produced and imported seeds and planting materials, evaluating, characterizing and conserving plant genetic resources, conducting seed technology research to produce and maintain good quality of seeds and planting materials, conducting National Plant Protection activities and ensuring the strict implementation of the Plant Protection and Pesticide Acts.

Plant Quarantine Service

Facilitate the international movement of healthy plants and plant products for the development of national agriculture and related industries.

Plant Genetic Resource Center

Plant Genetic Resources Centre is responsible for planning, implementing and co-ordination activities related to conservation of plant genetic resources.

Registrar of Pesticides

The office of the Registrar of Pesticides has the national responsibility to ensure high quality pesticides those are least hazardous to human health and environment enter the market in Sri Lanka. Main function of this office is enforcement of the Control of Pesticides Act No. 33 of 1980, its amendments and regulations.

6. Seeds and Planting Material Development Center (SPMDC)

This center is responsible in ensuring timely availability of quality seed & planting material to the stake holders at competitive price.

7. Extension and Training Center (ETC)

To center is to ensure economic and social rejuvenation of clients, specially farmers and contribute to a sustainable agricultural development by identifying and dissamination of technologies pertaining to crops contributing mainly towards local food production , food security and develop relevant human resources.

Activities of the division are focused on four main areas:

- ❖ Extension (including research)
- ❖ Training
- ❖ Communication
- ❖ Agricultural education & examination.

Under the Ministry of Agriculture extension activities are vested on both central government and Provincial councils.

8. Socio-Economics and Planning Center (SEPC)

Vision of the SEPC is to help DOA and Ministry of Agriculture (M/A) to achieve the excellence of Agriculture in Sri Lanka by ensuring the adoption of new technologies, which are economically feasible, socially or culturally acceptable and environmentally friendly.

SEPC has a broad mission to conduct socio-economic research and agricultural policy analysis needed by the DOA and M/A. It also assists the Ministry of Agriculture in analysis and drafting of agricultural policies.

Research planning and management in the DOA

As stated above there are three main crop research institutes namely RRDI, HORDI and FCRDI and NRMC to conduct agriculture research on food crops in the island. These institutes are empowered to formulate and conduct research programs of their mandated crops. However, research planned by these institutes must be approved by the disciplinary working groups of the DOA.

Disciplinary working groups of the DOA

The total research program of the DOA was divided into disciplinary working groups with the objective of compiling all related research to avoid duplication and to improve quality of research. All scientists of DOA who handles similar research projects are members of that group. As such each year, each disciplinary working group members collectively discuss their program and results of the previous year and formulate future research directions.

Table 4. Disciplinary working group and the number of research projects undertaken by each group in 2009

Disciplinary working group	Number of research experiments
Plant breeding & Bio technology	160
Agronomy, plant physiology and farm mechanization	45
Soil fertility	63
Pathology	79
Entomology	79
Soil and water management	26
Weed science	10

Statistics of the research division of the DOA

Table 5. Staff by type of work in the Department of Agriculture, Sri Lanka

Institute	Scientists	Technicians	Junior Scientists	Research administrators
FCRDI	40	42	20	4
HORDI	68	167	70	5
RRDI	27	60	50	4
NRMC	7	23	4	1
Other	26	36	20	3
Total	168	328	164	17

Table 6. Human Resources in the research in the DOA, Sri Lanka (2009) by educational level

Institute	Diploma	Graduate	M Sc	M Phill	PhD
FCRDI	40	29	7	1	3
HORDI	146	72	59	16	18
RRDI	55	27	16	10	6
NRMC	12	6	6	2	3
Other	14	7	10	1	1
Total	267	141	98	30	31

Statistics of all National Research Institute in Sri Lanka (Agriculture + other scientific disciplines)

Table 7. Research Expenditure for different institutes and % allocation of the GDP

Institute	Recurent budget, Rs million	% of the total GDP
Coconut Research Institute	750,656	0.0035
Dept of Export Agric (other crops)	689,861	0.0032
HARTI (market analysis etc)	1,931,593	0.0089
IPHT (post harvest)	174,714	0.0008
Rubber Res Inst	3,050,873	0.0141
Sugar Res Inst	1,039,287	0.0048
Tea Res Inst	4,291,628	0.0199
Department of Agriculture		
FCRDI	244,924	0.0011
HORDI	1,077,581	0.0050
RRDI	626,401	0.0029
Total allocation for all research in Sri Lanka		0.13

Table 8. Scientists highest qualification by discipline in the NARS

Discipline	Untrained scientists		Trained scientists			% trained
	No	%	PhD	M Sc	M phill	
Agric Engineering	21	50	3	5	13	50
Animal Prod & Health	3	19	4		9	81
Aquatic Sci & Fisheries	6	26	3	7	7	74
Agronomy	41	49	11	15	17	51
Food Sci	11	46	1	1	11	54
Forestry	2	33	1		3	67
Natural Resources. Management	6	29	4		11	71
Plant Breeding and Genetics	53	46	18	11	33	54
Plant Physiology	1	13	4	1	2	88
Plant Protection	40	47	16	5	24	53
Support sciences	19	36	8	2	24	64
Socio economics	32	43	13	4	25	57
Soil Sciences	15	31	11	7	16	69

Table 9. Number of scientists by institute including plantation sector, 2006

Institute	Number of Scientists
Coconut Research Institute	37
Department of Export Agriculture	46
Forest Research Institute	7
Hector Kobbakaduwe Agrarian Research and Training Institute	33
Institute of Post Harvest technology	20
Rubber Research Institute	38
Sugar Research Institute	21
Tea Research Institute	37
Department of Agriculture – Research Div	353
Total in Agriculture Research	592

Source – carp inform database 2006

Table 10. National expenditure on R & D by source of funding (million US \$) -

Source of fund	1996		2004		2006	
	R & D Exp	%	R & D Exp	%	R & D Exp	%
Government sector	8.76	69.6	22.96	67.5	29.80	65.2
Private sector	0.19	1.5	0.20	0.6	8.71	19.0
Foreign origin	2.89	23.0	7.70	22.6	2.21	4.8
Other	0.74	5.9	3.15	9.3	4.99	10.9
Total	12.58		34.00		45.71	

Table 11 National R& D expenditure by discipline (million US \$) -

Discipline	1996	2004	2006
Agriculture	5.97	8.95	11.2
Natural Sciences	2.84	5.60	10.25
Engineering and technology	1.46	5.48	9.79
Medical Sciences	1.21	4.74	6.48
Social Sci & Humanities	1.08	8.92	3.51
Total	12.59	33.70	41.29

Table 12. Science and Technology personnel (STP) by category

STP category	2004			2006		
	Total number	% of STP	per million inhabitants	Total number	% of STP	per million inhabitants
S & T scientist	9,746	34.3	502.3	7,907	17.9	399.3
Technicians	12,302	43.3	634.1	9,803	22.2	495.1
Other supporting staff	6,384	22.4	329.1	26,358	59.9	1,331.20
Total	28,432	100	1465.5	44,068	100	2,225.60

Source – www.nsf.lk