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Report of a Workshop

# IMPROVING AGRICULTURAL RESEARCH ORGANIZATION AND MANAGEMENT: IMPLICATIONS FOR THE FUTURE

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**ISNAR**

International Service for National Agricultural Research

Report of a Workshop

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# IMPROVING AGRICULTURAL RESEARCH ORGANIZATION AND MANAGEMENT: IMPLICATIONS FOR THE FUTURE

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***ISNAR***

International Service for National Agricultural Research

# ORGANIZATION AND STRUCTURE IN SRI LANKA

**S. D. I. E. Gunawardena**

## INTRODUCTION

Agricultural research in Sri Lanka dates back to 1822 with the establishment of the Botanical Gardens when, during the British colonial era, it was used for the introduction of tea, rubber, cocoa, citronella, and other plantation crops. Research activities on these crops led to the establishment of the Department of Agriculture in 1911, with the research division being one of the main units. Research in the Department of Agriculture was guided by the Central Board of Agriculture appointed by the Minister of Agriculture, until the 1950s, when the Ministry of Agriculture was established. Over time, numerous changes have taken place in the responsibilities of this ministry, and today its primary mandate is food crops.

## STRUCTURE OF THE AGRICULTURAL RESEARCH COMPLEX

At present, agricultural research is carried out in at least 15 separate research institutes and departments which function under seven ministries and the Office of the President. All research units come under the auspices of their respective ministries. However, some are semi-autonomous, being controlled by boards. These units have greater flexibility of operation than those coming under line ministries.

Ministries responsible for research in agriculture, forestry, and fisheries are the Ministry of Agricultural Development and Research (MADR), Ministry of Lands and Land Development (MLLD), Ministry of Rural Industrial Development (MRID), Ministry of Plantation Industries (MPI), Ministry of Coconut Industry (MCI), Ministry of Fisheries (MF), and Ministry of Higher Education (MHE).

In addition, the Natural Resources, Energy, and Science

Authority (NARESA), under the Office of the President, supports agricultural research in areas deemed to be of high national priority.

## MINISTRY OF AGRICULTURAL DEVELOPMENT AND RESEARCH

This ministry is responsible for research and development of all crops except rubber, tea, coconut, and cashew; and has four separate research units: Department of Agriculture (DA), Department of Minor Export Crops (DMEC), Agrarian Research and Training Institute (ARTI), and Sugarcane Research Institute (SRI).

## DEPARTMENT OF AGRICULTURE (DA)

This department, headed by a director, has ten divisions, each headed by a deputy director: Research, Extension, Education and Training, Economics and Projects, Farms and Planting Material, Engineering, Seed Certification, Botanic Gardens, Administration, and Finance.

Directors and heads of divisions meet to formulate work programs and prepare budgets. The director reports to the secretary of the Ministry of Agricultural Development and Research and through him to the minister.

The Director of Agriculture is responsible for the development and dissemination of new technology for the farm sector and is specifically responsible for food crops. Improved technology generation is the responsibility of the Research Division. Because of the diverse agro-ecological conditions of the country, many crops can be grown successfully, but the area suitable for a particular crop is often small. Crops on which research is being carried out are rice, which is the staple food, coarse grains (maize, millets, wheat, and triticale); roots

and tubers (potato, cassava, sweet potato, yams, and taro); grain legumes (mung, cowpea, blackgram, soybean, pigeon pea, chickpea; condiments (chili, onions, turmeric, fenugreek, cummin, fennel); agro-industrial crops (cotton, kenaf, groundnuts, sesame, castor, sunflower, safflower); and horticultural crops (vegetables, fruits, and cutflowers).

The Research Division is responsible for the formulation of the national research strategy for these crops, including the establishment of priorities, facilities, and staff.

Research is organized on a regional basis. Three main climatic zones have been divided into eight agro-ecological regions on the basis of climate, relief and soil. The main irrigated and irrigable areas of the Mahaweli System 'C' are included as an additional region. There are nine regional research centers (RRCC), and two additional research centers are devoted to special crops or situations. Some RRCCs have smaller satellite experiment stations under their control.

The Land and Water Use Unit and the Soil Conservation Unit, together with the headquarters administration and technical staff located at Peradeniya, constitute the rest of the Research Division.

Research programs are being formulated at the regional level within broadly defined operational objectives. Close linkages have been established with extension services and farmers through the formation of regional technical working groups which meet twice a year. These groups consist of staff drawn from the following divisions within the Department of Agriculture: Research, Extension, Education and Training, Farms and Planting Material. Officers and representatives from other organizations and university faculty of agriculture are invited to these meetings. These meetings, together with work in the agricultural extension and adaptive research program, ensure interaction between research, extension, and farmers. The overall program of the research division is considered by divisional committees and later as a part of the departmental program at meetings of division heads which are chaired by the director of agriculture.

There are lead stations for particular commodities and nationally coordinated programs for the major crops. The lead stations or the program coordinators establish or develop linkages with international research institutes or project agencies through the divisional headquarters in Peradeniya.

At present there are linkages with IRRI, CIMMYT,

CIP, CIAT, ICRISAT, and AVRDC. Staff from the Division of Agricultural Economics and projects are posted to the RRCC under the respective station directors. They are concerned with data collection of agricultural statistics and are required to interact with the regional research and extension staff in the study of production economics and farming systems and in planning of research programs.

An in-service training center for dissemination of information forms part of the regional research complex. There are also 24 adaptive research units, one in each district, for on-farm testing of new technology.

For funding research programs, a consolidated budget is forwarded through the secretary of MADR to the Ministry of Finance and Planning. Allocations are made to MADR under object-codes, where each covers a range of activities such as research, extension, and education and training.

## **DEPARTMENT OF MINOR EXPORT CROPS (DMEC)**

This department was started in 1972 and is responsible for a large number of mainly non-food crops which have local and potential export markets. From these a few crops have been selected for initial attention: cocoa, coffee, cloves, nutmeg, cinnamon, cardamon. The director of DMEC is responsible to the secretary of MADR. There are two divisions: the Research Division and the Technical Division, dealing with extension and training and related activities. Each is headed by an assistant director. Administration and accountancy units complete the department. Although the main research station is at Matale, substations have been established at Delpitiya for multidisciplinary cropping of mid-country tea areas under the national Agricultural Diversification Authority, Kundasale for work on cocoa, Wariyagala for work on cinnamon and cocoa, and Gammaduwa for work on cardamon.

Research programs are formulated within the Research Division for submission to the director of Minor Export Crops and then to the secretary of MADR. Due to lack of staff, some research work has been contracted to the Coconut Research Institute (CRI), Tea Research Institute (TRI), and the Postgraduate Institute of Agriculture (PGIA). Research programs are devoted to germplasm collection and evaluation, agronomic and crop protection studies in monoculture and in mixed culture.

## **AGRARIAN RESEARCH AND TRAINING INSTITUTE (ARTI)**

This is an autonomous unit established by an act of Parliament and is governed by a board nominated by the Minister of Agricultural Development and Research. There is wide representation on the board. Board members are the secretary of MADR (chairman) and representatives from the following ministries: Lands and Land Development, Mahaweli Development, Rural Industrial Development, Trade and Shipping, Finance and Planning, Rural Industrial Development, Plantation Industries, and Higher Education.

Ex-officio members are the Director of Agriculture, the Land Commissioner, the Commissioner of Agrarian Services, the Director of Irrigation, the Commissioner of Cooperative Development, and the Director of Rural Development. The other members are the Director of Agrarian Research and Training Institute, a representative of the Central Bank, a representative of the Faculty of Agriculture, University of Peradeniya, and the country representative of the Food and Agriculture Organization of the United Nations (FAO). The composition of this board reflects ARTI's mandate to work on research and training, socio-economics, and institutional aspects of agriculture. ARTI is the only major state organization in this area and has the largest group of socio-economists in the country. It is organized into four research divisions – Agricultural Planning and Evaluation, Production Economics and Extension Irrigation, Water Management and Agrarian Relations, and Market and Food Policies. The director is assisted by two deputy directors, and each division is headed by a research and training officer.

The budget is received through the MADR, but is at the disposal of the director for programs agreed upon by its board. The budget covers only staff and institutional costs. All program operating costs must be obtained from other sources. Hence the program consists mainly of contract work for development projects which provide funding.

## **SUGARCANE RESEARCH INSTITUTE (SRI)**

Research on sugarcane was carried out by the Sri Lanka Sugar Corporation prior to 1981, following on the work being done in the mid-1940s by DA. The basic agronomic and disease control practices had been established for two small production areas. Production from these areas amounts to 10 percent of the estimated annual sugarcane consumption of 250,000 tons.

In order to increase sugarcane production and to recognize the need for research support if this industry is to expand into new areas under both irrigated and rainfed conditions, the government has established the autonomous Sugarcane Research Institute by an act of Parliament passed in 1981. SRI is controlled by a board of five members: the Director of the national Institute of Plantation Management (chairman), the Director of Agriculture, representatives of the Faculty of Agriculture, University of Peradeniya, the Chairman of the Sri Lanka Sugar Corporation (ex-officio), and a representative of the Ministry of Finance and Planning. Germplasm has been collected for breeding purposes at several research stations. Linkages have been established with the sugarcane breeding institute at Coimbatore, the sugarcane institute at Mauritius, the United States Department of Agriculture, and the Canal Point Research Station in the United States. A detailed plan for the development of SRI has been drawn up, including provision of facilities for research on sugarcane production and in-mill technology.

It is expected that most research on the crop will be of an adaptive nature because the basic agronomic requirements of cane are known, and Sri Lanka does not have any unusual pest or disease problems. Some breeding work may be needed, but initial emphasis will be on collection of varieties from other countries (subject to adequate quarantine safeguards) for testing under Sri Lankan conditions.

## **MINISTRY OF LANDS AND LAND DEVELOPMENT (MLLD)**

Land-use policy and planning, and settlements, especially in the large irrigation schemes, are the main responsibilities of this line ministry. Two departments under this ministry carry out small research programs in addition to irrigation research on the engineering aspects of water management.

## **FOREST DEPARTMENT**

The Forest Department's main task is to provide services, resource management and planning, and advice. It has a small research unit, which concentrates on studies of botanical characteristics of indigenous species and management of natural forests. Since 1954, the forest cover has been rapidly depleted, and replanting with fast-growing exotic species has been undertaken. Research on silvicultural practices for species grown in pure stands has also been started in recent years. Research staff depend on the cooperation of the conservators of forests in all this work. The activity of

this department includes forest management studies, which range from watershed management practices to preventing siltation of large tanks, provision of fuel wood for new settlements, and community forestry projects to provide local sources of fuel, poles, and timber.

## **IRRIGATION DEPARTMENT**

The Irrigation Department is mainly concerned with the supply of irrigation water for crop production. The Land Use Division of this Department is responsible for the national soil survey. The Irrigation Department carries out research in two areas: designing of water supply structures and land capability surveys, and in land-use, planning, and establishment of a rational land-use policy. The Irrigation Department conducts some research on in-field water management, supported by grants. Linkages have been established with MADR and the Ministry of Mahaweli Development to identify the research problems in some areas.

Strengthening of the research capacity of the Irrigation Department, so that it may interact effectively with the newly formed International Institute of Water Management, is under consideration.

## **MINISTRY OF RURAL INDUSTRIAL DEVELOPMENT (MRID)**

MRID is responsible for the overall development of the livestock and small industries sector. In the livestock sector, its activities are the direction and supervision of the Department of Animal Production and Health, the National Milk Board, the Ceylon Oils and Fats Corporation, the National Livestock Development Board, the Livestock Development Division; formulation of a Livestock Development Policy; preparation, implementation, monitoring, and control of plans for the livestock industry; provision of supporting infrastructure and services, and regulatory activities; and promotion of research and extension on livestock production. These activities, which constitute about 90% of the work of MRID, are under the direct control of the MRID secretary. An additional secretary is responsible for the small industries sector. The need for a strong planning unit has been recognised, and donor support for its development has been secured.

## **DEPARTMENT OF ANIMAL PRODUCTION AND HEALTH (DAPH)**

Research undertaken by MRID is located in DAPH. Adaptive research is done in association with several

development projects. This department is headed by a director and has the following divisions: Animal Health and Extension; Animal Breeding; Education, Training and Information; Livestock Farms; Livestock Development; Research: Administration; Accounts; and Engineering.

## **RESEARCH DIVISION**

Research staff of this division are concentrated at the veterinary research institute at Gannoruwa. The division is responsible for the vaccine laboratory, the animal virus laboratory, and the regional veterinary investigation centers. The veterinary research institute has seven sub-sections: pasture and fodder crops, animal nutrition, animal breeding, bacteriology, parasitology, and reproductive disorders. Linkages have been established with veterinary officers who are responsible for advising farmers and extension workers on livestock production. The research program is heavily biased towards animal health. The small amount of work on pastures and feeds overlaps with work being done in the University of Peradeniya and the Department of Agriculture of MADR. At present, there is no formal mechanism by which appropriate research programs can be formulated jointly by MARD and MRID, the ministries responsible for research on crops and livestock.

## **MINISTRY OF PLANTATION INDUSTRIES (MPI)**

MPI is responsible for plantation crops other than coconut and sugarcane. The two main export crops, tea and rubber, are each served by a long-established specialist commodity research institute. There are differences between these research organizations, primarily because of the difference in the structure of production in the two industries. The boards and officers responsible for the tea and rubber industries come under the secretary of MPI. Operationally, however, the industries are controlled by boards established by acts of Parliament.

Legislation also provides the basis for funding the research institutes through cesses on exports. The boards are largely autonomous in their day-to-day operations, within the general policies established by the group consisting of the ministers of Finance and Planning, Plantation Industries, and Trade and Shipping.

## **TEA BOARD**

The Tea Board is directly responsible for the Tea Research Institute, Division of the Tea Commissioner,

and the Tea Promotion Bureau. It is indirectly responsible for the tea small-holders development authority (SHDA), for which it provides funds. TSHDA, which has its own board distinct from tea board, is a semi-autonomous unit. The Tea Research Board, which assists the Tea Board in the control of TRI, consists of three research scientists, two representatives of the trade (brokers or exporters), and one representative of the private estate sector.

### **TEA RESEARCH INSTITUTE (TRI)**

The Tea Research Institute was established at St. Coombs Estate, Talawekele, by the tea industry itself. As a consequence, it has developed as an integral part of the industry, with the producers playing a major role in determining research policy and in carrying out part of the work at minimum cost to the institute. Until recently, 12 of the 18 members of the management committee were drawn from the industry.

TRI is responsible for research on production and processing of tea. Its advisory responsibilities are limited to estates of more than 50 acres.

TRI also assists the TSHDA. Funding is provided directly by the Tea Board on the basis of the cess on exports. Linkages with other research units in Sri Lanka are mainly on an informal basis, but TRI obtains funds from DMEC for work in mid-country areas, for growing pepper as an inter-crop.

Programs are drawn up by senior scientists, and after agreement with the Director, they are submitted to the Tea Board for approval.

### **TEA SMALLHOLDER DEVELOPMENT AUTHORITY (TSHDA)**

Its main activities are the provision of processing facilities and buying green leaf for processing in its own factories. TSHDA also administers all grants and improvement schemes for tea smallholders and provides advice on production.

### **RUBBER RESEARCH BOARD (RRB)**

The Rubber Research Board is responsible for research and advisory services on production and processing of rubber. The members of the Rubber Research Board are chosen to represent specific interest groups. The composition of the RRB is as follows:

- Chairman elected by the members;

- Director of RRI (ex-officio) Vice Chairman;
- Director of Agriculture;
- Rubber Controller;
- One member of the National Assembly (usually from the rubber districts);
- Two members nominated by the Planters Association;
- Two members nominated by the Low-country; Producers Association;
- One member nominated by the Minister of MPI to represent the smallholders;
- Deputy Secretary to the Treasury of his representative.

### **RUBBER RESEARCH INSTITUTE (RRI)**

RRI operates directly under RRB. The director and the staff of RRI develop research programs, and RRB exercises a monitoring and evaluation role through program reviews at two- to three-year intervals. These reviews are carried out by groups outside RRB. Research activities are funded by the cess on rubber exports, which is paid directly by the Customs Department to the RRB.

### **MINISTRY OF COCONUT INDUSTRY (MCI)**

MCI is responsible for the industry as a whole. The Coconut Development Authority (CDA), which is under MCI, has a board of five full members and four observer members. The secretary of MCI is chairman of the board. The observer members are ex-officio, but the full members are nominated by the minister and act in their individual capacities. The work of the CA in relation to production and research is split between the Coconut Cultivation Board (CCB), which is responsible for the advisory and extension service and the administration of development schemes; and the Coconut Research Board (CRB), which is responsible for research on production and aspects of processing. CDA itself carries out some research work on processing and product development.

### **COCONUT RESEARCH INSTITUTE (CRI)**

There are subcommittees of the board of CRI for research, administration, and estate management. The research subcommittee has six members: the chairman and one other from CRB; the general manager of CCB; a representative of Janatha Estates Development Board (JEDB); and the director and deputy director (Research) of CRI. This subcommittee is responsible for planning, programming, and monitoring the work of CRI.

The main station of CRI is located at Lunuwila, in a



major coconut-growing area. CRI has nine outstation units, four of which provide appropriate sites for the general program. The other outstation sites are specialist units:

- parasite breeding station for work on biological control of pests;
- adaptive research farm, mainly for work on intercropping;
- a unit of three farms on the east coast for work on agronomy in the dry zone;
- a nursery in Colombo for the sale of plants;
- a seed garden for the production of improved planting material.

Funds are allocated on an annual basis from the ministry to CRB, which operates essentially as a department within a line ministry in budgetary matters. The budget of CRI is, therefore, less stable than that of TRI or RRI, which depend on cess contributions.

## **MINISTRY OF FISHERIES (MF)**

MF is responsible for overall development, regulation, and control of marine and inland fisheries, fishery harbors, handling of the catch, and coast conservation. Research is carried out by the National Aquatic Resources Agency (NARA), within MF. It is a semi-autonomous unit established by an act of Parliament in 1981. The fisheries research branch and the Institute of Fish Technology form the nucleus of the organization.

## **NATIONAL AQUATIC RESOURCES AGENCY (NARA)**

NARA is controlled by a board, of which the secretary of MF is the chairman. This board is responsible for general policy guidance and for provision and control of funds. Current research programs of NARA reflect the broad national policies:

- maintaining the present offtake, which represents about 60 to 70 percent of the estimated sustainable catch from inshore fisheries, and maximizing the proportion of the marine catch used directly for human consumption;
- developing the considerable areas of fresh and brackish water which are not fully exploited at present;

- exploring and responding to market opportunities, including some overseas, for other aquatic production; e.g., exotic fish for aquaria, and shrimp from brackish waters or produced in special cultures.

## **MINISTRY OF HIGHER EDUCATION (MHE)**

There are five main units concerned directly with agriculture, and animal health and production, within the university system:

- Faculty of Agriculture, University of Peradeniya;
- Faculty of Veterinary Medicine and Animal Science, University of Peradeniya;
- Faculty of Agriculture, University of Ruhuna;
- Faculty of Agriculture, University of Batticaloa;
- Post-graduate Institute of Agriculture (PGIA), Peradeniya.

Funding for teaching in the universities comes from the University Grants Commission. MHE funding for research is quite inadequate; research, therefore, depends largely on external funding from either NARESA or abroad. Funding for training at PGIA comes from several sources, including DA, which sponsors members of its own staff.

## **THE OFFICE OF THE PRESIDENT**

NARESA, which was constituted by an act of Parliament in 1981, is the only unit in the research complex in Sri Lanka that reports directly to the President.

The main objectives of NARESA are to advise the president on policies concerning science, national resource development, and energy; to initiate and sponsor research in these areas; to collect and disseminate information; and to study and report on matters of importance regarding science and technology, natural resources, and energy. NARESA has a governing board comprising the director general, who is chairman, and ten members appointed by the President from a wide range of mainly scientific and socio-economic disciplines. There are ten working committees in the various areas of NARESA's responsibility.

The main activity of NARESA in agricultural research so far has been the channelling of funds to priority research areas, in response to specific requests from staff in public-sector institutions. These grants are made from local resources or from funds provided by donors for specific purposes.

## **WEAKNESSES OF THE NATIONAL AGRICULTURAL RESEARCH SYSTEM**

The existing agricultural research system in Sri Lanka is recognized to be adversely affected by: weak linkages between policy makers, producers, and researchers; inadequate channels of communication within the line ministries between policy makers and research institutions; absence of a forum to develop national research priorities; inadequate level of operational funds and low ratio of support staff per scientist; low funding level for livestock, forestry, fisheries, and minor export crops; lack of a systematic manpower training program; restricted use of program budgeting among research institutions; insufficient emphasis on research areas that need participation of more than one ministry or research institution.

With a view to rectifying these weaknesses of the agricultural research system, a World Bank-funded agricultural research project is due to commence with the following major objectives:

- to improve the capacity of the national agricultural research system in facilities and trained manpower, and to develop systematic manpower planning in agricultural research;
- to procure realistic funding for research institutions to match the broad requirements of the national agricultural research efforts;
- to promote inter-institutional coordination of national agricultural research by improving linkages among

research organizations to establish national research priorities and a national agricultural research plan;

- to develop mechanisms for agricultural research to contribute to national planning and policy-making in a regular and purposeful way;
- to improve the process of formulation and articulation of research programs and to improve the administration and financial procedures in agricultural research management.

Under this project, a council for agricultural research policy (CARP) is to be established for research coordination and planning. CARP would be established by an act of Parliament.

The functions of CARP will be mainly advisory, but it will have executive authority for allocating funds for certain inter-ministerial research programs of national importance; post-graduate training for agricultural research staff; for conferences, workshops, and other activities on national, international, or inter-institutional agricultural research issues.

## **SUMMARY**

The national agricultural research system in Sri Lanka is complex, with research functions dispersed over several line ministries and the Office of the President. Several modes of governance exist among the different organizations. Research-extension-producer linkages appear to be relatively more effective in the line ministries than in other institutions.