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**FOOD, NUTRITION
AND AGRICULTURE**

Introduction

The agriculture sector plays a vital role in Sri Lanka's economy. With more than 70% of the population living in rural areas depending on agriculture for their livelihoods, this sector contributes approximately 11% to the Gross Domestic Product (GDP) and generates 30% of the employment. Sri Lanka became self-sufficient in rice production in 2011 and maize in 2012.

However, the growth of this sector has been rather slow. Fragmented land use, changing weather patterns, insufficient availability of water, credit, seed, technology, marketing, storage and transportation, high cost of inputs, labor shortages and poor farming practices continue to weaken productivity in agriculture. The farming community is moving away from agriculture due to low profit margins caused by many reasons.

Approximately 90% of the poor live on rural agricultural economy. Therefore, rapid agricultural productivity growth is fundamental for reducing poverty in Sri Lanka. Production of food while protecting the environment, natural resources, and bio-diversity needs to be given high priority in Sri Lanka's development strategies. High dependence on external inputs, which causes high cost of production as well as environmental pollution, is a major issue. Food security should be achieved through environment friendly management systems.

Proper regulations are also required to protect farmers in terms of marketing of their products, and providing necessary inputs. Postharvest measures also should be given due consideration in order to prevent losses and obtain maximum benefits to the farmer.

Proper nutrition is a basic requirement of human beings. However, with the ever changing food consumption patterns the attention paid on quality and nutrition received from food are very poor. Issues observed in this sector are lack of awareness on food varieties and nutritional levels, unethical and misleading advertisements, lack of simple methods to identify quality food, etc.

Attention paid on food safety and risk assessment in Sri Lanka is also not sufficient to assure healthy and quality food to the population. Food poisoning, food-borne disease outbreaks are regular incidents in the country. There are high possibilities of food and agricultural products being contaminated with agrochemicals, and unfavorable additives and toxins.

In order to have a healthy population it is necessary to implement proper surveillance systems, create awareness on nutrition and quality of food, control food borne diseases, carry out risk management and food safety assurance.

Sub Areas, Issues and Relevant Interventions

Table 1: Sub Areas and Justifications

Sub Areas	Justifications
1) Crop- based Production & Productivity	Although Sri Lanka has achieved self-sufficiency level in rice and maize, other serials, vegetables and fruits are not produced to meet the national requirement. It is necessary to increase production and maximize productivity providing agricultural inputs (high quality seed & planting material, agricultural credit, better land and water management practices and labor). At the same time planned cultivation /market oriented production and better production technologies and climate change issues should be addressed.
2) Food and Nutrition	Food and proper nutrition is essential to improve quality of life, and enhance socio-economic development of the country. It can be achieved by providing optimum nutrient levels, which leads to maintaining good health and nutritional well-being at all stages of life.
3) Food Safety risk Assessment	Food Safety risk assessment is necessary to improve the food and food control systems to achieve food safety, reducing the numbers of food-borne diseases. Areas such as food contamination, agro- chemical residuals and natural toxins should also be given proper attention.
4) Eco Friendly Agriculture	Healthy ecosystems provide humans with many requirements to sustain the life, including clean air and water, fertile soil, food, medicines, materials and diversity of genes and species. Eco-friendly agriculture focuses on food production while preserving the biological diversity, wildlife, natural ecosystems and places which are critically important for the survival of mankind, plants and animals.
5) Postharvest handling and processing	Postharvest handling and processing is vital to enhance the national agricultural growth by; reducing postharvest losses and assuring food security through innovative technology development, increasing value addition, improving processing, packaging, quality control and value addition. On the other hand designing of processing machineries and utilizing by-products, can develop sustainable agro-industries, create new employment opportunities in the sector and increase the income level of the rural farming community.
6) Commercial and Small Farmer profits	Sri Lankan farmers earn low profit margins compared to other Asian countries. This is one of the major reasons to move farmers away from agriculture. Therefore it is necessary to attract youth and women to develop this area by providing inputs (such as small-scale machinery) and creating a good marketing system using ICT for agriculture and aqua culture.
7) Livestock production and Fisheries	The livestock sector which consists mainly of the dairy and poultry sub-sectors, are considered as priority areas for growth, employment generation and increasing income of rural farmers. However, local production, especially milk and milk products is sufficient only to meet 33% percent of the requirement at current consumption rate. Although Sri Lanka has a considerable potential in offshore/deep sea, inland fisheries and aquaculture, the fisheries sector contributed only around 1.3% to GDP in 2012. The sector also employs over 650,000 people directly and indirectly through related activities.

Table 2: Issues/Problems, R&D Needs and Relevant Interventions

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
1) Crop based Production & Productivity	I) Lack of high quality varieties/ planting materials	i) Development of new varieties	Pure and Applied Research a) Research on high-yielding varieties tolerant to biotic and abiotic stresses b) Research on conventional multiplication methods
	II) Absence of accurate assessment programmes on national seed requirement	i) Develop accurate assessment system	Pure and Applied Research a) Survey on accurate assessment of national seed requirement Capacity Building a) Train Agricultural Officers(AOs) on assessment
	III) Poor nutrient and soil erosion management	i) Development of sustainable community based erosion control methods ii) Measures to minimize use of chemical inputs	Policy Studies a) Policy for upgrading soil erosion and nutrient management Pure and Applied Research a) Research on sustainable erosion control methods Innovations a) Community based erosion control methods Capacity Building a) Train AOs on new methods

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
Crop based Production & Productivity (Contd...)	IV) Lack of demand driven production system and unplanned cultivation	i) Optimize the cultivation pattern and varieties according to the market needs/climate/nutritional requirements	Pure and Applied Research a) Market research on demand and supply Information and Communication Technologies a) Database on market information Popularization a) Create awareness among farmers on market needs, climate changes etc.
	V) Lack of labor and mechanization	i) Develop appropriate machineries and train people	Pure and Applied Research a) Research on development of machinery suitable to local conditions Capacity Building a) Train farmers on use of machinery
	VI) Poor water use efficiency	i) Develop water conserve farming systems	Pure and applied Research a) Research on water-conservation farming systems Innovations a) Cultivation systems with minimum water use Popularization a) Create awareness among farmers
2) Food and Nutrition	I) Lack of awareness on nutritional value of food	i) Assessment of nutrient contents of food ii) Establish food composition tables	Pure and Applied Research a) Research on nutrient contents of food and their functionality Popularization a) Create awareness among the general public

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
	II) Lack of simple method to identify quality food	i) Develop simple methods to identify quality food	Pure and Applied Research a) Research on food contaminations and toxicities
	III) Unethical and misleading advertisements	i) Development of proper regulations on advertising	Policy Studies a) Development of policies/ regulations for food advertisements Popularization a) Create awareness among the general public on proper nutrition
3) Food Safety risk Assessment	I) Absence of scientific investigation and data on chemical residuals	i) Risk assessment of agrochemicals / food additives	Pure and Applied Research a) Research on agrochemicals and their impact on human health
	II) Lack of proper surveillance programs	i) Survey on occurrence of toxicity in food crops ii) Assessment of risk factors	Pure and Applied Research a) Research on methods to reduce toxicity in food
	III) Food borne -disease outbreaks	i) Minimize food-borne diseases ii) Minimize food poisoning outbreaks	Pure and Applied Research a) Research on food borne diseases and control measures Popularization a) Create awareness among general public on food poisoning
4) Eco Friendly Agriculture	I) Low priority to indigenous species	i) Improve the indigenous varieties to compete with exotic species	Pure and Applied Research a) Research to Improve the indigenous varieties to compete with exotic species Popularization a) Promote use of indigenous species

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
	II) High- dependency on external inputs	i) Promote use of low cost and environmentally friendly inputs	Pure and Applied Research a) Research on cost effective farming systems
	III) Lack of knowledge on bio pesticides & biologically active compounds	i) Promote biological control of diseases	Pure and Applied Research a) Research on bio pesticides Indigenous Knowledge and Intellectual Property Rights a) Produce bio-pesticides using Indigenous knowledge Popularization a) Create awareness among farmers and Agriculture Officers
	IV) Competitive species	i) Control of competitive species	Pure and Applied Research a) Identification of invasive species and research on control measures Popularization a) Create awareness among farmers
5) Postharvest handling and processing	I) Poor supply chain management/marketing and un-planned harvesting	i) Establish a proper marketing system for agriculture products	Pure and Applied Research a) Market research Information and Communication Technologies a) Develop databases to supply market information Capacity Building a) Train farmers on post-harvest handling and processing
	II) Higher energy cost	i) Develop low cost post-harvest handling methods	Pure and Applied Research a) Research on low cost postharvest processing methods Innovations a) Energy efficient post-harvest processing methods

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
	III) Poor postharvest quality of agricultural products	i) Develop novel techniques for postharvest handling	Pure and Applied Research a) Research on traditional packaging materials and postharvest technologies
6) Commercial and Small Farmer profits	I) Absence of proper communication in farmers' clusters	i) Develop proper communication channels to increase farmers' profits	Information and Communication Technologies a) Develop information channels/databases etc. Popularization a) Create awareness among farmers
7) Livestock production and Fisheries	I) Use of illegal and unregulated fishing methods	i) Develop sustainable fish catching methods	Innovations a) Designing of efficient , low cost fishing gear and crafts b) New techniques/sustainable fishing methods Capacity Building a) Develop capacity for marine fishing Popularization a) Popularize sustainable fishing
	II) Lack of efficient captive breeding methods for fish	i) Development of breeding methods for high demand and endangered species	Pure and Applied Research a) Research on suitable captive breeding methods Capacity Building a) Development of infrastructure with facilities for culturing marine fish in captivity
	III) Underutilized and unutilized fish stocks	i) Identification and use of underutilized and unutilized fish stocks with economic value	Pure and Applied Research a) Research on natural diversity and density of fish

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
and Fisheries (contd.)	VIII) Lack of breeding animals	i) Develop improved breeds and breeding techniques	Pure and Applied Research a) Develop improved breeds b) Research on appropriate husbandry methods
	IX) Insufficient feed supply and Poor quality	i) Production of feed raw materials	Pure and Applied Research a) Research on new feed varieties b) Research on efficient pasture conservation and utilization methods
	X) Lack of value added products	i) Value addition to animal products	Pure and Applied Research a) Research on value-added products b) Research on utilization of byproducts