National Research Priorities in Organic Agriculture

2017-2021

National Committee on Organic Agriculture

Sri Lanka Council for Agricultural Research Policy
Ministry of Agriculture

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ISBN978-955-9224-66-2 Bar Code: 9 789559 224662

Contents

Message from the Chairman

Importance of organic agriculture has never been felt so important earlier than at present in Sri Lanka. Every day in life political leaders, policy makers, consumers and farmers in Sri Lanka are compelled to talk about the importance of food safety. Sri Lanka being an agricultural country could be contended that Sri Lankan farmers have made the country self-sufficient in our staple diet rice, while the total requirement of most of the fruits and vegetables are produced in Sri Lanka.

With the introduction of H4, the first improved rice variety and subsequent release of many high yielding rice varieties Sri Lanka entered the green revolution by increasing the crop productivity levels many folds which enabled the country to produce adequate food for the increased population. Sri Lanka also has introduced high yielding cultivars of Maize, hybrids of vegetables and other field crops. This situation has led to heavy dependence of agriculture on imported chemical fertilizers. Continuous use of chemical fertilizers insecticides and weedicides became an imperative to obtain maximum yields from the improved cultivars.

Consequently, slowly and steadily undesirable levels of heavy metals and other chemical components have accumulated in the soil and in crops leading to a serious social issue based on current agricultural practices. This situation has opened the eyes of agricultural scientists to immediately draw their attention to sustainable alternative no chemical agricultural production systems.

Therefore, there is an urgent need to develop more environmentally friendly socially acceptable farming practices through a new agenda of research and development and guide the agricultural research policy to achieve the above objectives.

Dr. S. D. G. Jayawardena
Chairman,
Sri Lanka Council for Agricultural Research Policy (SLCARP)
May 2017

Message from the Secretary/Director

Sri Lanka Council for Agricultural Research Policy (SLCARP) has identified research in organic agriculture as a priority in the Research and Development needs in agriculture sector in the country. The National Committee on Organic Agriculture has been appointed by the Council to specifically coordinate the overall research and development activities in organic agriculture conducted by the National Agricultural Research System (NARS) and the agriculture faculties of the National Universities with, a view to achieve excellence in National Agriculture Research Policy.

The Sri Lanka Council for Agricultural Research Policy (SLCARP) identifies and prioritizes the agricultural research needs in the country. Allocation of available research funds in an efficient and transparent manner has been made possible by this approach. This document on research priorities provides strategic directives to the donor agenesis and researchers who are interested in taking up the challenges of sustainable agriculture development to fulfill the nations' food and nutrient demand while improving the livelihoods of the rural families and providing sound biological and environmental benefits to the local communities as well.

In 2011, SLCARP established the National Committee on Organic Agriculture and Forestry (NCOA) as its 8th Technical Sub-Committee engaged in formulating the agriculture sub-sector priorities. The National Committee on Organic Agriculture and Forestry has conducted a series of consultative meetings, forums and open discussions with a wide array of organic agriculture experts in Sri Lanka before preparing this document. The committee has welcome reviews, comments and suggestions from the large and small scale producers, environmentalists and researchers. The Council gratefully recognizes the valuable contribution of Prof. S. P. Nissanka, Chairman of the National Committee on Organic Agriculture and Forestry (2015), Dr. SarathRanaweera, Chairman of the National Committee on Organic Agriculture (2017- present) members of the committees, and the private and public sector stakeholders who participated with enthusiasm in our forums to share valuable knowledge and experiences in organic agriculture. Special gratitude goes to the Department of National Botanic Gardens and the Ministry of Agriculture for giving the committee assistance for conducting the consultative meetings and preparing this document.

Dr. J. D. H. Wijewardena
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Abbreviations and Acronyms

CEA	Central Environmental Authority
CEOA	Centre of Excellence for Organic Agriculture
CRI	Coconut Research Institute
DEA	Department of Export Agriculture
EDB	Exports Development Board
FCRDI	Field Crops Research and Development Institute
HARTI	Hector Kobbekaduwa Agrarian Research and Training Institute
HORDI	Horticultural Crops Research and Development Institute
IFOAM	International Federation of Organic Agriculture Movements
ITI	Institute of Technology Institute
IUCN	International Union for Conservation of Nature
LOAM	Lanka Organic Agriculture Movement
MONLAR	Movement for National Land and Agricultural Reform
NARS	National Agricultural Research System
NCO	National Committee on Organic Agriculture
NCOA &F	National Committee on Organic Agriculture and Forestry
NGO	Non-Governmental Organization
NOCA	National Organic Control Authority
NOCU	National Organic Control Unit
PGS	Participatory Guarantee Systems
RRDI	Rice Research and Development Institute
RRI	Rubber Research Institute
SLAB	Sri Lanka Accreditation Board
SLCARP	Sri Lanka Council for Agricultural Research Policy
TRI	Tea Research Institute

Introduction

Sri Lanka as a country, abundant with natural resources, has a big potential to cater to the ever-growing world demand of organic products. Our capacity in supplying organically certified various types of products has increased dramatically. Other than the direct financial benefits gained from organic exports, the protection and conservation of environment by avoiding the use of agro-chemicals has become a major indirect contributory factor of organic agriculture in the modern economies.

Organic Agriculture is defined as a “production system that sustains the health of soils, ecosystems and people, relies on ecological processes, biodiversity and cycles adapted to local conditions rather than the use of inputs with adverse effects, combines the agricultural tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involve”(IFOAM, 2005).

Sri Lankan communities also have a strong natural inclination towards traditional agriculture practices which were predominant prior to the green revolution. In some other countries also traditional agriculture is viewed as “non-certified organic agriculture.” Thus in some occasions traditional agriculture is perceived as organic agriculture. However, the expected outcomes of organic agriculture are different among the various stakeholders. Though there has been a growing trend in the organic agricultural sector in the country, no adequate scientific evidences/database is available to address certain issues in the sector.

Provisions of the institutional support required for organic agriculture in terms of providing scientific basis of organic practices, credit/insurance, certification, training and extension for producers and exporters has been rather difficult and shows slow progress in Sri Lanka. The wide range of expectations and some conflicting interests among the different stakeholders can be a major reason for slow progress in the sector. Moreover, the general belief of low productivity of organic systems and other beliefs that are not supported by economic analysis further restrict the adoption of organic agriculture in Sri Lanka.

Objectives

The objective of this document is to identify the research needs in the organic agriculture sector and to prioritize them to guide researchers to conduct meaningful research for and funding organizations and related stakeholders to invest on research and development to fill the much needed information gap to promote and to ensure sustainable organic agricultural sector in the country.

Expected Outcomes

This document is expected to provide;

- Priority research themes for research institutes, funding agencies and researchers as a guideline to address the current research needs and to form a platform to execute those issues with better collaboration
- Basis for the research institutes, which involve in the organic and allied fields, to re-direct their research programmes to be more focused
- Strategic directions for the national research programmes to formulate research projects and investments during the next 05 years and to assist for policy making for sustainable development of the sector.

Background

1. Organic Agriculture Market in Sri Lanka

The latest survey conducted by the Lanka Organic Agriculture Movement (Anon, 2015) indicates that 78,502ha of land were under organic management. This includes Participatory Guaranteed System managed and in - conversion lands. In total, 62,560 hectares were organic certified. Total organic acreage now represents 4 percent of the total agricultural land area in the country. There are about 1,213 organic farms of which 524 are individual certified farms and 62 of them are farmer organizations.

The main features of organic agricultural systems in Sri Lanka are as follows;

- Regular use of compost and green manure
- Crop rotations
- Mulching for weed suppression, water conservation and soil erosion control
- Use of fermented extracts of plants or animal origin as liquid fertilizers
- Pest control by maintaining natural diversity, use of plant detergent, plants and compost extracts and traditional methods
- Mixed cropping
- Raised beds with greater depth of fertile soil for home garden vegetable growing
- Alley cropping for shelter and erosion control
- Analogue forest or forest garden
- Respecting the dignity and basic needs of animals but allowing confinement for collection of liquid waste and dung to improve husbandry
- Use of biodynamic methods (vitalizers, influences of cosmic energies active in all life processes)

Organic agricultural production is largely export oriented whilst the bulk of organic exports are shipped to the USA, Canada, EU, Japan, and Australia. Exports to the Middle East are growing. The domestic market for organic products is expanding from urban communities to rural, where organic production has taken root as local communities take up consumption of organic foods. There were 223 exporters exporting of organic products including organic tea, spices, essential oils, cashew, desiccated coconut, dried fruits, vegetables and herbs valued about USD 228 million (Anon, 2015).

2. Current Organic Agriculture Research Programmes and Issues

Some related research work has been carried without a national research agenda by Universities, Government Departments, and Non-governmental organizations and also based on personnel interests. It is important to have a national research strategy for organic agriculture to address the important key issues.

Following research needs in organic agriculture sector requires being addressed during the next 5 years;

- Decreasing the conversion period
- Efficient pest, diseases and weed control measures for organic agriculture
- Analysis of harmful residues in organic products available in the market
- Separately identifying the naturally occurring substances and pollutants/contaminants
- Scientific basis of some organic/traditional techniques

Organically grown traditional export crops such as Tea, Coconut, and Spices and also emerging crops such as Pineapple, Chili, Rice, Turmeric, *Centella* sp. (Gotukola), Jack Fruit (Polos) and Drumstick are demanded in developed countries. Coconut Research Institute (CRI), Tea Research Institute (TRI), Department of Export Agriculture (DEA) and Rice Research and Development Institute (RRDI) currently research on these crops.

Medicinal Plants, Cashew, Soya and Maize can be considered as the second level priority crops. The current agricultural research has not adequately invested to develop the non-traditional crops and emerging crops. SLCARP is currently funding only the priority organic agricultural research.

Organic rice, vegetables and fruits are demanded in the local market. Research on organic vegetables is mainly carried out by the Horticultural Crops Research and Development Institute (HORDI). Research to develop organic fertilizers is carried out in the Department of Agriculture Centre of Excellence for Organic Agriculture(CEOA) in Makandura.

Scientific information on the techniques that were used in traditional agriculture is limited. Thus recommending such practices to the national use is limited.

Stakeholder Consultation and Outcome Presentation

The national research agenda on organic agriculture comprises of research needs, priorities, strategies and action plan. The National Committee on Organic Agriculture of the SLCARP conducted a stakeholder workshop to gather the information on major issues that the sector has been facing. Consecutive consultation meetings were held to priorities the research needs, build strategies and to plan activities to solve the identified issues in the sector. These recommendations will be made available for funding agencies especially of national funding sources to consider when the funds are allocated for organic agriculture research projects.

The major events conducted in research need identification in the organic agriculture sector and setting up priorities were as follows;

- National Stakeholder Consultation Workshop for Identification of Organic Agriculture Research Priorities
- Two Expert Consultation Forums were held

Based on the above meetings the thematic areas were identified. Then major issues, specific issues, research strategies and activity plan were developed accordingly.

Thematic Area 1: Productivity improvement in organic agricultural systems

During the conversation period growers observe low yields and farm income from organic agriculture. The main reasons for marginal or low productivity can be identified as poor soil and water conditions, usage of low yielding varieties and inappropriate agronomic practices.

Major Issue 1: Marginal or low productivity of the land, poor soil and water conditions

Specific issues:

- Land degradation, soil and water contamination

Research Strategies:

- Categorization of agriculture lands based on soil status
- Identification of land improvement requirements in different categories
- Developing suitable soil reclamation mechanisms for different land categories
- Identification of appropriate crops and animals for specific site conditions considering eco-physical, social and cultural issues

Activities:

1. Land classification, mapping and development of site quality indices
2. Developing effective soil and water improvement and conservation methods
3. Detection of soil and water pollutants /contaminants, causal factors, and developing soil reclamation and water conservation measures
4. Developing organic farming systems for different agro-ecological regions
5. Developing land preparation, irrigation, harvesting etc. technologies suitable for large scale mono-crop cultivations

Major Issue 2: Lack of Suitable Planting Materials for Organic Agriculture

Specific Issues:

- Lack of high yielding crop varieties
- Inadequate supply of planting materials
- Poor seed producing and planting materials multiplication programmes

Research Strategies:

- Identification of high yielding crop varieties suitable for organic agriculture
- Developing self and community based seed production systems

Activities

1. Screening of crop varieties and identification of high yielding crops
2. Community based planting material production and distribution
3. Agricultural extension for producing seeds and planting materials on farm

Major Issue 3: Adoption of Inappropriate / poor Agronomic Practices

Specific Issues:

- Poor land preparation
- Poor pests, diseases and weed management
- Poor water management
- Not adopting farming systems or suitable crop/animal combinations

Research Strategies

- Development of crops specific agronomic packages

Activities

1. Develop crop specific management protocols
2. Identify suitable crop/animal/fish combinations and farming system management
3. Develop pest and nutrient management measures for organic agriculture

Thematic Area 2: Develop scientific basis of indigenous agricultural practices

If the traditional agricultural and bio dynamic farming technologies could be proven effective at the current socio-economic and environmental conditions in Sri Lanka a new pathway can be opened to the sustainable agriculture development. The researches have to be based on scientific experimentation, yield trails, cost benefit analysis and proper documentation techniques.

Major Issue 1: Lacking adequate agronomic practices for organic agriculture and promotion of agronomic practices which are not experimented and recommended

Specific Issues:

- Lack of scientific information about some traditional agricultural practices

Research Strategies:

- Compilation of local/traditional management techniques
- Assess the scientific basis of traditional agricultural practices

Activities:

1. Screening effective local/traditional agronomic practices/ management techniques
2. Experimenting traditional agronomic practices, pest diseases and weed control measures under different agro-ecological conditions
3. Publishing the effective agronomic measures in organic agriculture

Thematic area 3: Improve the availability of quality organic inputs at an affordable price

Organic agriculture relies on a narrow range of inputs such as compost, and crop residues as the principal soil fertility management strategy. Producing a variety of less bulky and more nutritious organic fertilizers and other plant growth promoters can decrease the conversion period and increase the production of organic agriculture.

Major Issue 1: Lack of Quality Organic Fertilizers

Specific issues:

- Lack of less bulky locally produced bio-fertilizers
- Lack of growth promoting substances and production technologies

Research Strategies:

- Identification of suitable substances, organisms and sources of organic fertilizer
- Experimenting on organic fertilizer production systems
- Experimenting on natural plant growth promoters

Activities:

1. Screening of sources to be used as organic fertilizers
2. Identification of suitable substances/micro-organisms and effective combinations
3. Testing soil macro and microorganisms in farming systems
4. Develop mass scale production techniques

Thematic Area 4: Assessing the quality of organic foods which are currently available in the market

Testing the contamination levels in foods that are currently sold in the market as organic foods can ensure that the customer expectation is actually fulfilled because organic foods are generally viewed as safe foods by the consumers. Understanding about other health benefits of organic foods compared to the conventional agricultural produce also has to be improved.

Major Issue 1: Lack of Information on Contamination Levels in Various Organic Foods available in the market

Specific issues:

- Lack of knowledge on quality variations in organic foods

Research Strategies:

- Investigation of contamination levels of organic products
- Separately identifying naturally occurring levels and other harmful contaminations

Activities:

1. Develop quality variations in organic products based on the level of contaminants
2. Conduct studies to identify the naturally occurring substances and their levels in organic foods

Specific Issues: Lack of Information on total Nutritional Benefits in Various Organic Foods

Research Strategies:

- Assessing agricultural produce based on genetic, environment and management measures differences

Activities

1. Conduct comparison studies for nutrition and other health benefits of foods grown under different cultural practices such as organic, bio-dynamic and conventional agriculture

Thematic area 5: Need of appropriate post-harvesting, processing and value addition techniques

Proper post-harvest handling, food preservation and processing technologies can be explored for organic agriculture.

Major Issue 1: High food wastage due poor postharvest handling

Specific Issues:

- Lack of methodologies for storing and maintaining keeping qualities of organic products

Research Strategies:

- Development of postharvest handling protocols

Activities:

1. Develop guidelines for farm-to-fork management chain
2. Experimenting on increasing keeping quality and storage life

Thematic Area 6:Certification and Standardization

International accredited certificate is required for local organic agriculture when entering into the developed international markets however obtaining, organic agriculture certificate is very expensive. Participatory Guaranteed Systems have been developed in many countries as an alternative certification system. Both these systems attribute extra cost to the cost of production.

Major Issue 1: High cost of certification acts as a barrier for new producers entering the market

Specific issues:

- Lack of awareness on standardization and certification process

Research Strategies:

- Assessing the Social Impact of Organic Agriculture Certification

Activities:

1. Supply chain analysis
2. Study the standardization and certification process adopted in other countries and different organizations

Thematic area 7: National policy on organic agriculture

National policies are developed after consulting the key stakeholders in the sector. Strategic strengthening of the sector, aimed at long term development of organic agriculture in Sri Lanka is highlighted.

Major Issue 1: Gaps in the National Policies which are related to Organic agriculture

Research Strategies

- Identification of policy gaps
- Identification of the impacts of other agricultural policies on organic agricultural sector

Activities

1. Estimate socio-economic and environmental cost/benefits involve in conversion of current agricultural lands into organic farms
2. Study the impacts of related agricultural policies on Organic Agriculture sector
3. Formulate policy briefs for the Organic Agriculture sector in Sri Lanka

References

The General Assembly of IFOAM (2005), in Adelaide, Australia. http://www.ifoam.bio/en/organic-landmarks /definition-organic-agriculture

Anon (2015). Personnel communication with several NGOs

Annexure I:

List of Participants at the Workshop for Identification of Organic Agriculture Research Priorities

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3. Chinthaka Jayasooriya	HARTI, Colombo 07
4. D. A. Harishandra	Sri Lanka Nature Forum
5. D. A. Perera	EOAS Organic (Pvt.)Ltd
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ISBN978-955-9224-66-2

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