



***Editorial***

## Agroecological Perspectives in Sri Lanka


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### Introduction

Before the Green Revolution in Sri Lanka came into effect in the 1960s; as featured by the imposition of modernised technology, high yielding varieties, increased use of fertilizers and other agrochemical inputs; the country had ecologically sustainable agricultural systems of different dimensions. Farmers adopted diversified farming practices and cultivated their crops while maintaining an excellent balance between the natural environment and human health. Our forefathers-maintained soil fertility using bovine manure, crop rotation, and planting shrubs and trees adjacent to crops, leading to an array of benefits including enhanced farm productivity and improved soil health. Thus, the system preceding Green Revolution was remarkably interactive.

However, the Green Revolution made the extensive use of fertilizers and other inputs to support crop growth, and eventually farmers lost fertility in the crop lands impelling them for external applications of manure and fossil fuels. The fundamental purpose of Green Revolution in the Sri Lankan context was to enhance total agricultural production, notably in terms of rice, targeting the upliftment of the living conditions of rural people which is principally poverty alleviation. A number of malpractices adopted by the farmers during fertilization, accompanied by misjudgement on applying chemicals targeting larval stages vs. adult insects, or mixing multiple chemicals without proper knowledge on the undesirable consequences lead pesticides to be useless.

Farmers' methods of agricultural management have had a massive impact on biodiversity loss and growing greenhouse gas emission. Ultimately, compromising human and environment, the Green Revolution in Sri Lanka has proven to be not successful in securing its sufficiency, nutritious or availability at an economical value in the long run as of today following a duration of half a century from its inception.

### **Would agroecology be a solution?**

Reforms of Sri Lankan food systems; from food production to consumption, in all strata including urban and rural communities targeting the improvement of stakeholders' livelihoods is vital. These strategies should ensure an increase in the productivity, sustainable intensification, and ecological intensification (Tittonell 2014). Agroecology is the pathway to apply the ecological intensification strategy into local agroecosystems. Thus, Agroecology offers a potent technique for speeding the needed reforms of food systems in Sri Lanka. In current context, the wisdom possessed by the traditional farmers are no longer available, and a long way is pending to gain the benefits of agroecology.

Application of the common framework of the FAO of ten elements of agroecology (FAO 2018), necessitates a systematic engagement of all stakeholders of food systems. Approaches to enhance the

summative impacts of agriculture are already incorporated in many agroecosystems, but seemingly have been concealed under modern agricultural approaches. Unveiling benefits of agroecological foundations always give positives as the ten aspects of Agroecology are interrelated and interdependent. They encompass ecological characteristics of agroecological systems (diversity, synergies, efficiency, resilience, and recycling), social characteristics (co-creation and sharing of knowledge, human and social values, culture, and food traditions), enabling political and economic environments (responsible governance, circular and solidarity economy). These factors come together in a model that relies centrally on the non-exhaustive and non-destructive use of biodiversity and ecosystem services, with off-farm inputs playing a diminishing role in agricultural production.

More often, Sri Lankan farmers manage their farms with standalone agroecological approaches, either for the betterment of their own productivity and livelihoods or obtaining production of premium products under different certification systems, especially in perennial basis systems. Knowingly or unintentionally, farmers of these agroecosystems have included regenerative conservation agriculture, organic agriculture, agroforestry, permaculture, and agro-silvo-pastoral

systems at varying degrees. On regional basis, farmers deploy specific selected strategies of agroecology such as integrated nutrient and pest management, on-farm development of semi-natural habitats, implementing reduced or no-till arable crops, or sustainable groundwater management. Due to certain significant changes in legislation and the economic slump as well as with no or low affordability of synthetic inputs, some farmers utilize bio-fertilizers and bio-protectants instead of agrochemicals. Further, classical agronomic approaches such as intercropping, and use of cover crops are prevalent to raise the Land Equivalent Ratio (LER), while in many sectors, concepts of 'precision agriculture' and 'climate-smart agriculture' are also observable. Nevertheless, purely agroecological farms have remained a niche, the classical Kandyan forest gardens being the most likely to be found in Sri Lanka.

Although certain standalone agroecological practices have been successfully implemented on many farms and practices such as resource-conserving agriculture are transforming the food systems at a slow rate, yet these have not become mainstream until now. The most salient obstacles to mainstream agroecology include ignorance by the public; the time lag between implementing and observing

positive consequences; limited knowledge and advisory systems; transaction costs; policy incoherence; crucial deficits of landscape-level coordination, incentive systems in research, and compensation for yield reduction (CNS-FAO 2021). Addressing the food and nutrition security effectively and sustainably, it is not sufficient to focus merely on technology solutions and breakthroughs or incremental interventions. Food system transformation involves (i) inclusive and participatory forms of governance, (ii) co-production and sharing of information and knowledge between communities, and (iii) responsible innovation that guides the system towards solving social challenges.

### **The pathway towards realisation**

Agroecological transformation is believed to have five levels (Gliessman 2015): At level 1, farming systems become more efficient by reducing the consumption of fertilizers, pesticides, or fuel. Level 2 entails replacing agrochemical inputs with more natural products such as bio-fertilizers and bio-protectants. Based on the way we define agroecology, it also includes technologies that are safe for the environment and human health and boost the systemic processes. Most of the Sri Lankan agroecosystems are currently at the level 1 and 2. The measures of restricting inputs, imports, termination of subsidy schemes created a natural trend towards

input substitution. Level 3 is about rethinking farming systems with diversified crop rotations, mixed cropping, intercropping, leading to improved closed cycles of nutrients and organic material flow. Currently, farmers are going towards merging spatial and temporal diversities for detecting benefits that have been recognized since a long ago. Successful transformation of food system also includes drive towards an enhanced farmer-consumer interactions (level 4). Under Sri Lankan context, the government and alignment parties are expected to concentrate on short distribution channels in delivering items to the consumers with a smaller carbon impact. Finally, a total transformation of laws, norms, institutions, markets, and culture (level 5) is required in reaping the benefits of agroecology. The various stages proceed dynamically and in tandem such that when framework conditions are suitable, a diversity of production systems coexist, and rural regions continuously transform towards a higher degree of sustainability.

As described above, addressing all five levels of agroecological transformation demands effective mechanism and offer activities that promote transformation and remove barriers. The gains through mainstreaming agroecology would be a win-win method in enhancing sustainability, thereby attaining the SDGs.

At present, a roadmap of policies, rules, and measures to successfully embrace agroecology has been established for decision-makers for a proper implementation of agroecology. Building capacities for bottom level extension and support services under the hood of agriculture are crucial since the absence of technical knowledge to satisfy the demand for food using agroecology is the biggest problem at the present. Further, lack of coordination between researchers, officials, and decision-makers to incorporate current findings of studies into decisions is one of the prevalent flaws not only in Sri Lanka, even at global level. At the market, “Are our consumers prepared to pay a premium for agroecology”? a critical question that is raised by many. The bulk of consumers in Sri Lanka can only afford cheap produce, hence agroecological producers require competitive prices for their products as well if they need to succeed.

### **Conclusion**

Sri Lanka is a fantastic example of why agroecology needs to be viewed as a holistic approach that is as much about just economic and social transition. Agroecological approaches are increasingly relied upon to play a greater role to create sustainable food systems. Therefore, Sri Lanka is also moving towards that transformation. Most of the success stories of agroecology take this into account and

are also driven by small-scale farmers themselves as protagonists of the shift which is crucial if it is to be effectively scaled. If we implement the concept and at the same time apply a coherent set of policies, agroecology will create sustainable and resilient food production systems that help maintaining ecosystems progressively enhancing land and soil quality. Agroecology further aids in maintaining the genetic diversity of seeds, cultivated plants and domesticated animals. Through the promotion of reduced, alternative (non-synthetic chemical), and safe application of crop protection agents, agroecology can reduce risks associated with pesticide exposure and thus improving the health of rural workers and consumers. All these potential benefits of agroecology mentioned above combined with long-term productivity, social well-being and improved agency, reduction of food waste/loss and a sufficiency-oriented agricultural production require both a re-thinking of the indicators and the ways of measuring performance of agricultural and food systems (Mottet et al. 2020). Coherence and synergy of agroecological elements of agriculture is the cornerstone for establishing farming as an interesting, gratifying job attractive for the young generation.

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