

# **Modernization of Domestic Agriculture**

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## **Background**

Agricultural productivity measured using growth accounting methods shows that inadequate land augmenting technological change during the post-green revolution period has been the main factor for the non-competitiveness of the food crop sector in Sri Lanka. Land-augmenting technologies will always increase yield per acre but may actually reduce variable input per acre relative to traditional technologies. Sri Lanka still cultivates varieties that were developed or introduced in its early adoption up to today and in some instances, it is the only promising variety grown for years. Nevertheless, significant labour has been substituted by machinery power. Stagnating productivity growth in the domestic agriculture sector, not getting a fair price for their produce and production of primary goods for the market are considered to have implications on food prices on one hand and low income for farmers. It is expected that the modernization of agriculture can bring growth momentum in the agriculture sector through technological and institutional innovations. The modernization of domestic agriculture intends to increase agriculture productivity, improve market access, and enhance the value addition of smallholder farmers and agribusinesses. Changing role and share of the market, government and international partners for technological and institutional innovations in modernizing Sri Lankan domestic agriculture in comparison to the region is the focus of this analysis.

This historical account of the role played by market, government and international partners in different degrees starting from the period of green revolution to today in modernizing Sri Lankan domestic agriculture and the influence of changing world order in realizing the domestic efforts is based on a study conducted by Wickramasinghe & Samarasinghe (2021).

## **The period of the Green Revolution spanning from the 1940s to the mid-1970**

This period is characterized by direct government support in developing domestic agriculture through various policies, public expenditure programs and establishment of supportive institutions through Acts. Domestic policies, institutions and international support and philanthropy capital enabled the country to achieve varietal development breakthroughs and the adoption of the new technology by farmers. Sri Lanka was successfully engaged in collaborations with international partners particularly CGIAR during this period. Gene transfers for developing NIV of paddy during the green revolution period is a historical breakthrough in technology generation. The momentum gathered during this period of green revolution coupled with large scale irrigation investments made it possible for Sri Lanka to become self-sufficient in rice production by the mid-1980s.

## **From the mid-1970s to the mid-1990s**

This is one of the most turbulent periods in the history of domestic agriculture. Domestic structural changes and uncertainties and the changing development assistance during this period made Sri Lanka start to drift away from its relative position in the region. Liberalization of the economy and opening the market for the private sector, gradual withdrawal of government

intervention, structural reforms and establishment of the provincial administration, civil disturbances and loss of NGO trust are significant factors. The main thrust in domestic agriculture had been factor intensification through input availability after liberalizing the economy, massive public expenditure on irrigation and subsidized fertiliser. The devolution of agricultural administration and extension systems affected the dissemination of technology. The achievements in the food crop sector during the post-green revolution era are not remarkable;

Parallel to these, the changes that happened in the international sphere badly affected Sri Lanka. With the private sector and multinational companies starting to dominate in the seed industry and the patenting of plants, they have made restrictions on open access genetic resources for varietal development in developing countries. This affected Sri Lanka too. Also, the development assistance to CGIAR has contracted. However countries like India adjusted to the change. Indian private sector took over the main breeding programs and state capital was invested in CGIAR

The exploitation of hybrid vigour of cross-pollinated crops and some self-pollinated crops and early research in genetic engineering (GE) are the technologies that brought large shifts in the yield frontiers during the post-green revolution era in other parts of the world. Bangladesh NGO sector started to take a leading role in adjusting to the new situation.

### **After the Mid 1990s**

After the mid 90s, open economic policies continued with further liberalization and with increased private sector participation. This paved way to factor embodied technology transfer from overseas through exotic hybrid seeds, tractor imports and other agrochemicals and equipment imports. However, with multinational companies having being dominated the seed industry and patenting of plants, open access to genetic resources and technology spillovers have become more constrained. Certain imported technologies have been becoming costly and not adaptive.

Taking a larger share of transaction through the open market, it also led to several institutional innovations for technology transfer in agricultural value chains. Various forms of value chain innovations that were introduced by input and output companies were able to overcome constraints and enhance access to the adoption of these new technologies. The contract grower system which was introduced by the central bank in 1999 through its Forward Sale Contract (FSC) program made a value chain innovation in commercializing maize to become the second-largest field crop in the country. Supermarkets have also been able to reduce transaction costs and create value for crop commodities through market segmentation.

However, with the government withdrawing from market intervention it is observed the creation of oligopsony and oligopoly markets in certain input and output markets and exploitation of farmer share of agriculture surplus.

### **Future Scenario**

Developing countries' collective effort in search of new technology is now mostly bound to state capacity to invest in technology generation and to afford to technology developed in other parts of the world. Therefore country will need to become more self-reliant in the provision of agricultural R&D. Public research system has a vital share in creating new knowledge and

technology as private, corporate and non-governmental sectors have limited incentives for innovations in Sri Lanka. Vertical spillovers from FDI by engaging in global value chains are also not significant in Sri Lanka.

Input availability is a big question today. Although efficient use of inputs is important for environmental sustainability, the input should not be a constraint for production. Technologies of precision agriculture help achieve the efficiency of resource use. The country can benefit from frontier technologies available for agriculture modernization; particularly information technology has a vital role in technology transfer, supply chain management and resiliency.

The economic surplus generated by modernizing domestic agriculture that produces food essentials should lead to fair sharing of benefits among the rural farmer and the average consumer and should not lead to the accumulation of wealth in the hands of few market participants.

## **References**

Wickramasinghe W. & P. Samarasinghe (2021) *POLICY RESEARCH ON AGRICULTURAL PRODUCTIVITY* Undertaken for the Agriculture Sector Modernization Project (ASMP) of the Ministry of Agriculture by MARGA