

White Paper

A New Vision for Myanmar's
Agricultural Development

From Rice Bowl to Food Basket: **Three Pillars** for Modernizing Myanmar's Agricultural and Food Sector



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Foreword

By U Tin Htut Oo

Chairperson, National Economic and Social Advisory Council

As the promise of the November 2015 elections takes form in a new government and parliament, people throughout Myanmar are eager to see improvements in their daily lives. This is particularly true of Myanmar's rural sector, where 7 of every 10 Myanmar people live and where the majority of people in poverty reside. Over half of our people are employed in agriculture, producing food for themselves, their communities, and for sale. Many in rural areas – often without their own land – also work hard in rural non-farm enterprises, delivering farm inputs and other goods to rural markets, transporting produce to markets, processing foods, and providing needed services. Others may migrate in search of work in Myanmar's cities or abroad.

Our country sits in the most economically dynamic region in the world, yet has among the highest rates of malnourished people. Our Asian neighbors have shown that investing in rural infrastructure and establishing policies to encourage their farmers to produce products that meet market needs unleashes a virtuous circle of growth among farmers, food processors, and service providers who are linked to growing urban centers and export markets. Raising productivity and diversifying from low-value grains into high-value meats, oilseeds, pulses, horticulture, and aquaculture stabilizes prices for increasingly urban consumers, raises incomes for rural areas, and strengthens competitiveness in regional and global markets. In our Asian neighbors, it has helped raise millions of rural people out of hunger and poverty.

Myanmar is ready to seize that promise for its own future. But we must break away from a legacy of policies that have held back, rather than stimulated, our farmers' potential. A mind-set change is needed to step out of the Green Revolution, business-as-usual approach that focused on supply-led yield increases and domestic food self-sufficiency. We need to shift to an innovative new agricultural policy vision that centers on a demand-led approach driven by domestic consumers and foreign markets with increased productivity throughout the sector. To succeed in practice, we need to break down narrow silos of thinking and communication among the government, the private sector, and civil society to encourage more harmonious and coordinated efforts.

This new Vision is inherent in the title of this White Paper – moving from rice bowl to a food basket for our country and increasingly to the rest of Asia (and the world).

Our White Paper offers a concrete and systematic strategy for how Myanmar can modernize its agricultural and food sector – through forward-looking and efficient government policies and institutional support, combined with private-sector-led investment, innovation, and dynamism, centered on small farmers throughout our country, and implemented through greater interaction among key stakeholders with full transparency and accountability. The new Vision centers on three propositions:

1. In the past, Myanmar's agricultural sector was driven by supply requirements. ***The future of our agrifood sector and agribusiness supply chains will be driven by the market, principally from Myanmar's own consumers, but also from markets abroad.***
2. In the past, Myanmar's agricultural supply requirements were defined by the government. ***The future of our agrifood sector and agribusiness supply chain will be led by small farmers and, more broadly, the private sector, both Myanmar and foreign. The government will provide support through transparent and accountable policy/regulatory frameworks and public investments that ensure core social and physical infrastructure as well as the quality, safety, and efficiency of agrifood systems and the products that are produced and consumed.***
3. In the past, policy governing Myanmar's agricultural sector was narrowly focused on the production of crops. ***The future of our agrifood sector and agribusiness supply chains will be shaped through reliance on a three-pillar strategy that embraces open decision-making by small farmers, producing a wide range of agrifood products and supported by responsive input suppliers and productive technology with knowledge and information service providers (all upstream) and reliable access to output markets and supply chains (downstream).***

We hope everyone finds our paper and recommendations useful during this critical period of policy discussions as the new government and parliament take form. Should this fresh, comprehensive, and systematic vision for agriculture and food development in Myanmar be agreed upon, it is our hope that this paper will stimulate ever-deepening discussions and development of detailed strategies in the priority areas identified here.

Acknowledgements

The idea for this White Paper grew out of one of the priority mandates tasked to the National Economic and Social Advisory Council (NESAC). As NESAC requires outside expertise to combine with local knowledge, it reached out to the United States Agency for International Development (USAID) for support in developing a new vision for Myanmar agriculture in October 2015. U Tin Htut Oo, chairman of NESAC, laid out the cornerstones of such a vision for Myanmar agriculture and has guided the working group below. USAID, in turn, mobilized the support of its partners working on agricultural value chains, food security research and analysis, land policy, and private sector development.

NESAC's consultant team, led by Tin Htut Oo and Tin Maung Shwe, along with Duncan Boughton, Leslie Marbury, Steve Parker, Lynn Salinger, and Dan Swift from the USAID team, worked closely to lead the development of the paper and consultation processes. Dr. Thomas Reardon, professor at Michigan State University and global expert in the modernization of agricultural and food sectors around the world, contributed a conceptual overview based on the lessons learned by Myanmar's Asian neighbors during the course of their own agrifood sector development. He used these lessons to craft the three-pillar strategy to improve the incomes and livelihoods of rural communities in Myanmar by empowering smallholder farmers, equipping them with knowledge and technical inputs, and connecting them to urban and global markets.

This policy formulation process benefited from NESAC's collaboration with Grow Asia, a partnership between the World Economic Forum and the Association of Southeast Asian Nations (ASEAN) with Grow Asia's Myanmar Agriculture Network, a set of supply chain-focused working groups that aims to help smallholder farmers in Myanmar improve their productivity, profitability, and environmental sustainability. One of the tangible outcomes of the 2013 East Asia World Economic Forum held in Nay Pyi Taw was the establishment of the Myanmar Agriculture Network (MAN), spearheaded by NESAC in collaboration with the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI) and the Ministry of Agriculture and Irrigation.

The paper benefited greatly from two roundtables with Myanmar and international experts, held on January 7, 2016 and March 9, 2016, and a consultation meeting held with UMFCCI on April 1, 2016 with more than 50 representatives from affiliated agriculture and food business associations, media, and civil society representatives. Written inputs from a range of local and foreign experts further strengthened the paper.

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The contents of this paper are the sole responsibility of the NESAC consultant team and do not necessarily reflect the views of the Myanmar government, USAID, or the United States government.

From Rice Bowl to Food Basket:

Three Pillars for Modernizing Myanmar's Agricultural and Food Sector

Executive Summary

Myanmar is ready for change. This is particularly true of Myanmar's rural sector, where 7 out of every 10 people live and most people in poverty reside. Over half are employed directly in agriculture, producing food for themselves, their communities, and for sale. Many others in rural areas – often without their own land – work hard in rural non-farm enterprises transporting produce, processing foods, and providing needed services. Others may migrate in search of work in Myanmar's cities or abroad. Yet despite its location at the crossroads of the most economically dynamic region in the world, Myanmar has among the highest rates of poverty and malnutrition in the region.

Myanmar's Asian neighbors have shown that, in response to consumer demand for increasingly diversified diets as incomes and urbanization rise, *investing in rural infrastructure and establishing policies to encourage their farmers to produce products that meet market needs will unleash a virtuous circle of growth among farmers, food processors, and service providers who are linked to growing urban centers and export markets*. Raising productivity and diversifying from low-value grains into high-value meats, oilseeds, pulses, horticulture, and aquaculture stabilizes food expenditures for increasingly urban consumers, raises incomes for rural areas, and strengthens competitiveness in regional and global markets. Among Asian neighbors, it has helped raise millions of rural people out of hunger and poverty.

Myanmar is ready to seize that promise for its own future. Myanmar needs to break away from a legacy of policies that have held back, rather than stimulated, its farmers' potential. A mind-set change is needed to step out of the business-as-usual approach that focused on supply-led yield increases and domestic food self-sufficiency. Agriculture policy needs to shift to an innovative vision that centers on a demand-led approach driven by domestic consumers and foreign markets with increased productivity throughout the sector. To succeed in practice, narrow silos of thinking and communication among the government, the private sector, and civil society should be broken down to encourage more harmonious and coordinated efforts.

This new Vision is inherent in the title of this White Paper – moving from rice bowl to a food basket for Myanmar and increasingly to the rest of Asia (and the world). The aim is to improve the incomes and livelihoods of rural communities while increasing the availability of more stable, diversified, and nutritious diets to consumers. **This objective can be achieved by empowering smallholder farmers, equipping them with knowledge and technical inputs, and connecting them to urban and global markets.**

In place of a government-driven focus on crop production targets, the paper offers a concrete and systematic strategy for how Myanmar can modernize its agricultural and food sector. The strategy embraces market-oriented, private sector-led investment, innovation, and dynamism that is centered on small farmers throughout the country. It requires forward-looking and efficient government policies and institutional support with greater interaction among key stakeholders characterized by full transparency and accountability.

This new Vision for modernizing Myanmar's agrifood sector:

- Supports a view of change that is facilitated by government, but driven by the private sector;
- Emphasizes the central role of smallholder farms and small and medium enterprises (SMEs);
- Upholds the principles of transparency, participation, sustainability, and ethics in all policy development;
- Incorporates environmental and social sustainability considerations;
- Is systematic and sector-wide in its approach, including crops (both food and industrial crops), livestock, fisheries, and forestry/agro-forestry products, and the supply chains that connect input suppliers and farmers to consumers;
- Aims for intra-government coordination for improved policy making and implementation;
- Introduces ideas for building new structure, capacities, and responsibilities within the newly integrated Ministry of Agriculture, Livestock, and Irrigation, and recognizes the importance of price analysis to the policy work of the new ministry; and
- Is committed to systematic monitoring of the impacts and effectiveness of policy implementation.

Recommendations

The paper's recommendations are built upon a three-pillar approach that respects environmental and social conditions and aims to modernize: (i) input delivery; (ii) agricultural production; and (iii) output markets and supply chains. This approach has underpinned the successful transformation and modernization of the agricultural sector in response to changing patterns of consumer demand in many other countries in Asia. Similar changes in consumer preferences for a diversified food basket are already underway in urban and rural areas of Myanmar, providing similar opportunities to raise millions of people in Myanmar out of poverty.

Recommendations are summarized below and presented in more detail at the end of the paper in a “Matrix of Recommendations for Policy Reforms, Infrastructure Investments, and Institutional Innovations.”

Pillar One: Modernizing Small-Farm Production

Policies and Regulations

- a) **Provide farmers with the freedom to choose** which agricultural products to grow that will provide the best opportunity for them to increase their incomes relative to their land and labor assets, a policy to be embedded in appropriate ministerial statements, laws, and regulations. Empower farmers to increase their incomes through access to technical and economic information to support good decision-making, and facilitate voluntary membership in farmer associations for improved marketing and resource use.
- b) **Invest in infrastructure** for physical and virtual connectivity in rural areas, including transport, markets, irrigation, electrification, and telecommunications. Integrate use of modern information and communications technology (ICT) tools throughout the sector.
- c) **Promote adoption of mechanization** for land preparation and cultivation, land consolidation, water user associations, and credit availability to raise farm-level productivity and help farmers overcome rural labor shortages.
- d) **Innovate and build organizational and human capacity of government agricultural institutions** – within the Ministry of Agriculture, Livestock, and Irrigation; in agricultural education, research, and extension institutions; and through the establishment of an Agricultural Research Council, an Institute for Policy Studies in Agriculture and Rural Development, and a re-established Academy of Agricultural Sciences – to provide technical know-how, market information, and economic governance to all actors in the agrifood sector.

Pillar Two: Modernizing Input Markets

Policies and Regulations

- a) **Provide farmers with greater land tenure security** over agricultural lands.
- b) **Enact policies to liberalize and invigorate Myanmar’s seed, fertilizer (and other agrochemicals) as well as equipment markets**, while enforcing appropriate quality certification and product safety standards and encouraging the participation of domestic and foreign private sector firms.
- c) **Create an enabling environment for provision of a full range of financial services by the private sector** – including loans, savings, insurance, remittance transfers and leasing, through banks, microfinance institutions, and non-bank financial institutions – to rural-based individuals, farms, and rural enterprises.
- d) **Develop strategies for the efficient and sustainable use of natural resources**, including preparation of a master plan for all aspects of water use that should include

proposals for incentives to promote the more efficient use of water in the agricultural sector as well as for managing the impacts of climate change and disasters.

- e) **Promote rural non-farm employment and develop strategies to help rural communities adapt to rural labor shortages.**

Pillar Three: Modernizing Output Markets and Supply chains

Infrastructure Investments

- a) **Invest in supply chain infrastructure** – transport and logistics, wholesale markets, electricity, and Internet, as well as research, extension, skill-building, and security – along all spatial segments of the agricultural and food sector.

Policies and Regulations: Product Markets

- b) **Modernize meat and dairy industries** through the development of a new integrated policy on livestock development, promoting modern meat and dairy industries, including delivery of improved veterinary services; integrate livestock interests into land reform discussions.
- c) **Promote sustainable natural resource governance for capture fisheries.**

Policies and Regulations: Business-Enabling Environment

- d) **Improve the business environment** – by strengthening commercial law for contracts and dispute settlement, rationalizing internal taxes and permits, eliminating red tape, and enhancing consumer protection – for all segments along the agrifood supply chain.
- e) **Promote domestic and foreign direct investment** by approving the draft Investment Law, developing implementing regulations that encourage responsible investors throughout agrifood supply chains, and designing and implementing an investment promotion strategy for the agricultural and food sector.
- f) **Protect intellectual property rights** in the agrifood sector to promote research and innovation.
- g) **Develop a strong quality infrastructure** – product standards, quality grading, quality control measures, and reliable conformity assessment (testing) procedures – to help the agrifood sector get higher prices for higher quality goods, thus incentivizing quality upgrading.
- h) **Liberalize and facilitate imports and exports** by greatly reducing import licensing requirements, improving trade facilitation capacities, upgrading customs clearance processes and logistics facilities, improving transit processes, promoting agricultural exports, and upgrading trade diplomacy capabilities to protect Myanmar exporters.
- i) **Ensure the health and safety of crops, animals, and people** through the development and enforcement of new legislation based on best practices on food safety as well as sanitary and phytosanitary measures.

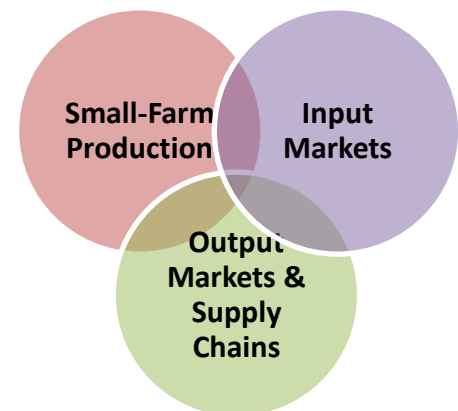
From Rice Bowl to Food Basket:

Three Pillars for Modernizing Myanmar's Agricultural and Food Sector

1. Introduction

Myanmar started 60 years ago to move toward an agricultural revolution with a burgeoning agrifood¹ sector and small-scale entrepreneurship, in step with the rest of Asia. In fact, many of the strategies recommended in this document were already being put in place at that early time. History intervened, ending that early progress, along with the public investments and market-enabling policies that had started to pay dividends in agricultural development and food security. Myanmar's period of economic stagnation was short by its long historical standards, but long from the perspective of Myanmar people alive today. The proportion of people living in Myanmar who participate in agriculture has changed little over the last half a century. The possibility now exists to initiate a renaissance in agricultural and rural development, where the vast majority of Myanmar people still live and work to support their families.

Other Asian countries have advanced greatly over these decades. Their success was organized around a three-pillar strategy to modernize their agricultural and food sector. This strategy can be applied as well to Myanmar to enable it to return to rapid development in this sector. The three pillars are the modernization of small-farm production and input markets, along with output markets and supply chains. Modernization of these three pillars requires investments, policy actions, and institutional reforms, as well as strong coordination between the government and private sector.



It is important to emphasize that none of these pillars can stand alone. Each depends on the others. That is, one cannot promote and modernize small-farmers without making investments in and enacting enabling policies toward developing rural input suppliers and developing rural-urban supply chains. Trying to enable private sector actors (both small and large) to build supply chains will fail if there is not a rapidly modernizing and developing small-farm sector. Infrastructure investments are needed in all three pillars. Critically, the pillars are highly inter-dependent in practice and thus need to be considered as a comprehensive package of policy reforms.

As Myanmar approaches creating a dynamic and sustainable development path for its agricultural and food sector, without doubt the most important context is the lessons learned from the experiences of other Asian countries as they have transformed their economies.

¹ For definitions of terms used in this paper, see the glossary at the end of this paper.

Myanmar can benefit from applying best practices and characteristics of the agrifood economy of the rest-of-Asia, including that:

- (1) The rest-of-Asia's agrifood economy has enjoyed success that has lifted hundreds of millions from poverty and hunger and helped to put it on the world stage;
- (2) The rest-of-Asia is quite like Myanmar, not just in culture but in having millions of hard-working, smallholder farmers, and economies full of entrepreneurial and proactive small enterprises; and
- (3) The rest-of-Asia started with rice-focused consumption, although most of it now has moved far beyond that.

With similar characteristics, Myanmar looks to the rest-of-Asia as its guide. With such a crucible of mixing and interaction, if Myanmar converges to the strengths of the rest-of-Asia through internal-market dynamism and external market integration, it can quickly move its agrifood economy forward to the benefit of the vast majority of Myanmar people. Indeed Myanmar's agrifood economy has the potential to become a high-value food basket, exporting not only to the rest-of-Asia but to high-income markets beyond the region.

The paper is organized as follows. Section 2 tells the story of the evolution of the rest-of-Asia's agrifood sector from the perspective of what foods are consumed, or what economists call "the demand side." The demand side shows how quickly the food market grew and transformed in the rest-of-Asia. This is already beginning to happen in Myanmar – the rest-of-Asia view gives a look ahead at how Myanmar's market are likely to evolve in the next several decades. Also, the rest-of-Asia market is important for Myanmar as a supplier of inputs and buyer of outputs.

Section 3 tells the story of the Quiet Revolution on the supply side of the agrifood sector in the rest-of-Asia. These insights will serve Myanmar well as it embarks on similar paths. The success of rest-of-Asia's agrifood-sector modernization came from orientation toward the market. "Three pillars" of modernization – (i) the small-farm production sector, (ii) input markets, and (iii) output markets and supply chains – encouraged the supply side to respond to the needs of and opportunities from the demand side. The huge engine of local and world demand was used to pull millions of farmers out of poverty and promote rural prosperity.

Section 4 provides a set of observations that characterize Myanmar's agricultural and food sector today. Section 5 uses the three-pillar structure to recommend policy reforms, infrastructure investments and institutional changes that the Myanmar government and the private sector – including farmers – can undertake to accelerate development in the agricultural and rural sector, including a sense of sequencing and prioritization. A matrix is then provided with more detailed recommendations.

2. Rapid Transformation of Food Demand

Food demand in the rest-of-Asia, leading with East and other Southeast Asian countries (and recently, to a lesser extent, South Asia), has grown immensely. But it is unlike anything that one could have imagined extrapolating from Asia of 50 years ago. Then, Asia was mainly rural, farms were mainly based on subsistence, diets consisted mainly of rice, and a large portion of the population was still poor and hungry. To simply multiply that up to the present day by adding a billion more consumers would not bring you to today's food demand picture in Asia.

Instead, today's rest-of-Asia food demand picture looks completely different from 50 years ago, in ways that represent attractive goals for Myanmar. In general, rest-of-Asia has become immensely better fed, with greatly diminished malnutrition and more diversified diets that have moved well beyond their base of rice; the locus of food demand has become primarily urban; and food consumption relies to a great extent on the market, i.e., on purchased foods, even in rural areas. Myanmar will move in the same directions, depending on the policies and strategies put in place now to prepare the supply side – all along the food supply chains – for these trends.

The rest-of-Asia diet changes are interesting and pertinent for Myanmar in a number of ways:

- First, the caloric intake of consumers in the rest-of-Asia has increased, and the incidence of basic caloric hunger has been sharply reduced, except in a persistent pocket of hunger in South Asia.
- Second, the diversity of Asian diets has greatly increased, so that now in the rest-of-Asia one-quarter to one-third of total food expenditures, even by rural consumers, is spent on basic grains such as rice, whereas two-thirds to three-quarters are spent on a more diversified basket of foods, including fish, dairy, fruits, vegetables, meats, edible oils, and processed foods. The average amount of rice consumed per person is actually trending down. These trends are even sharper in urban areas, which always foreshadow what will happen in rural areas, but with a lag.
- Third, the locus of food demand has shifted with urbanization as urban populations have risen from 10-20 percent in the 1960s to an average now of 50 percent of total populations in the region. Half to three-quarters of all food consumed in the rest-of-Asia is now consumed by urban consumers. Cities have thus become by far the main markets for farmers. The relative share of export markets overall for agrifood is minor, although some sub-sectors do rely heavily on export demand in some countries.
- Fourth, food needs are now in their majority purchased from markets – even the food needs of rural people. Around 70 percent of rural households' food in the rest-of-Asia is purchased. Rural consumers pay for food purchases from sales of agricultural products (hence the great importance of supply chains from rural areas to cities) and through rural non-farm employment. These two sources of earnings – originating in rural farm households' livelihood choices – are discussed more in the next paragraph. Markets and

food-supply chains to and from rural areas have become central to rural food security everywhere.

This shift to rural households buying a large share of their food needs is not driven by their inability to grow enough food (with the exception of the pocket of landless poor in South Asia and asset poor households in hinterland areas). Rather, the shift comes from households' freely made choices about the most effective ways to earn a living and spend their incomes. Farm and rural households today earn over 40 percent of their incomes from rural non-farm employment (RNFE). Local rural manufactures and services became important to Asian, rural household livelihoods. This expansion of the rural economy was driven by (1) activities directly linked to the farm sector (such as agricultural services, processing, food transport, and wholesale trade), and (2) other activities created as farm incomes were invested in local enterprises and spent on local RNFE outputs. This "virtuous circle" was crucial to poverty alleviation and rural economic growth. In the rest-of-Asia, RNFE is a far more important share of non-farm income than farm-level wage employment or remittances by those who have migrated, both of which are concentrated in a relatively small number of households. Farm households sell the majority of their production in order to buy a more diverse set of foods. Elsewhere in the rest-of-Asia this happens on farms that are considerably smaller on average than farms in Myanmar.

3. Public Investment and Policy Components of Rest-of-Asia's Success: "Three Pillars"

To take advantage of the huge opportunities developing on the food demand side, rest-of-Asia small farmers focused on, and responded to, the demand growth by diversifying their production and investing heavily in on-farm productivity. These millions of small farmers were the first and biggest heroes on the supply side in the rest-of-Asia. They rapidly and voluntarily (that is, they were not required to do so) adopted new practices, first of the Green Revolution in grains and then of revolutions in vegetables, fish, poultry, and dairy production. They invested in their farms by installing irrigation and buying fertilizer, seeds, and machines. They diversified their cropping beyond rice into vegetables, fish, meats, eggs, dairy, and fruit, in some cases earning 5-10 times more per hectare than they did with basic food grains. They greatly increased their output of maize, a non-traditional grain in Asia (produced today in greater volumes than rice in China), to produce feed for fish, chicken, hogs, and cattle, which added a significant amount of animal protein to rest-of-Asian diets.

In turn, tens of thousands of small- and medium-scale enterprises (SMEs) all along the agrifood supply chains, from input suppliers to truckers, storage agents, wholesalers, processors, and retailers, moved the mountain of food produced yearly by small farmers, mainly to the cities and some to export markets. In the process, the incomes of farmers that fed this supply chain were greatly increased.

Government investments and policies supported the supply-chain-driven miracle described above, but the miracle was driven by private investment and response to market opportunities by

farmers and firms throughout supply chains. The core elements of these accomplishments can be represented as a three-pillar strategy detailed below.

3.1. THE FIRST PILLAR: MODERNIZATION OF SMALL-FARM PRODUCTION

Rest-of-Asia governments did not just allow, but also helped, farmers both to raise grain-farming productivity and to diversify agriculture into higher-value products. Governments did this in two ways, through investment and policy.

First, rest-of-Asia governments invested substantially in rural areas in ways that supported free decisions and investments by farmers in agriculture and livelihood choices by rural households outside of agriculture. The main investments were in “hard (or physical) infrastructure” and “soft infrastructure” (“soft” refers to institutions and human capital), as follows.

Regarding hard infrastructure, governments invested mainly in:

- (a) **Tarmac roads**, both highways and feeder roads into farm areas, as well as other infrastructure, such as **rail and bridges**.
- (b) **Water control infrastructure** such as dams, canals, drainage tiles, culverts, and river dredging; this was crucial to land and water conservation, protection of villages and towns as well as roads and other physical infrastructure, and water provision to agriculture and rural populations.
- (c) **Electrification** of farm areas, to support irrigation and energize farm-support services, such as warehouses and cold storages, and energize rural off-farm enterprises crucial to the health and profitability of the farm economy, such as first-stage processing (including packing).
- (d) **Information and communications systems**, which have taken off in the rest-of-Asia, with plentiful examples of use of mobile devices, computers, and the Internet to share agricultural market and technical information with farmers.

Regarding soft infrastructure:

- (a) **Research and extension in production practices** to develop or adapt appropriate technical recommendations for farmers, such as for crop varieties, seed multiplication systems, fertilizer applications, plant protection practices, and for farming system recommendations based on soil and climate mapping, compatible inter-cropping and rotations, watering systems, harvesting and storage systems to reduce post-harvest losses, animal breeds, animal husbandry, feed mixes and rations, and animal health practices.
- (b) In some countries governments also invested in **research and extension in equipment**, broadly speaking. This usually responded to some cost constraint for farmers that mechanization could relax (such as South Korea’s work on small-scale

mechanization to reduce labor constraints on small farms so that rural households could diversify employment into the emerging rural and urban industrialization) or some design constraint to help farmers diversify crop production (such as design and diffusion of small-scale, inexpensive greenhouses built by farmers in China).

(c) **Phytopsanitary services**, including plant, animal, and food health protection.

(d) As supply chains became increasingly integrated, farmers had to learn how to comply with **traceability requirements** that are becoming increasingly important for the implementation of food safety laws and as a key element in voluntary food safety and quality standards required by commercial clients at home and abroad.

(e) Broad social (soft) infrastructure, such as **rural education, skills training, and basic health services**, help both farming and off-farm employment supporting the farm sector (such as equipment repair, first stage processing, and harvest handling).

Second, rest-of-Asia governments supported farmers and off-farm rural enterprises via **policies regarding farmer choice**. The key point is that rest-of-Asia governments allowed farmers to make their own choices on what to grow in response to what expanding urban markets wanted. In country after country, the regulations on cropping were simply abandoned until one cannot find any today. A Chinese, Vietnamese, or Indian farmer can grow absolutely any crop s/he wants. This also creates a diverse set of activities for farm households. Such production diversity helps farmers to manage crop, weather, and market risks.

3.2. THE SECOND PILLAR: MODERNIZATION OF AGRICULTURAL INPUT MARKETS

Rest-of-Asia governments have supported the rapid, economy-wide development of input markets through two sets of actions that have been crucial to small-farm and rural development. By “markets,” we mean not only the physical transactions of selling and buying a product (such as a bag of fertilizer), but also the broader context of the market that includes the institutions, regulations, and policies that condition it, the hard and soft infrastructure that serve as its base, and the social networks that interact with it. In addition to markets for the inputs themselves, support services such as information and communications technology, extension, and transport, are also important.

First, the hard infrastructure investments that governments undertook in rural areas, as already described above under Pillar One, were also crucial for private-sector engagement over time in the supply of agricultural inputs to farmers. The list of infrastructure investments is not repeated here.

Second, governments followed key strategies and enacted policies to support the emergence, and then development, of input markets. The following stand out:

(a) Governments in the rest-of-Asia have in general moved toward agricultural land policies that **increased property rights to land and the ability to rent as well as buy and sell land**. In some cases, such as in Thailand, Indonesia, and parts of India, these land policies were enacted early, swiftly, and fairly completely. In some cases such as in China, land reforms have been enacted in stages over time. For example, in China private land transactions among farmers have been piloted only recently, but over the past decade there has been a staged introduction of increasingly complete property rights over the land granted by the state to farmers, including the right to rent land. These shifts have created large, land-rental markets in rural areas and increasing tenure security, leading to greater flexibility of land access.

(b) Governments have moved from directly supplying agricultural inputs (and credit) to a **broad liberalization of agricultural input markets** in nearly all countries.

Governments initially built input depots and marketing facilities, especially in the 1970s and 1980s, but then throughout Asia governments withdrew from direct marketing of fertilizer, seeds, and equipment. Today, little to none of the input supply to farms in Viet Nam, Thailand, China, and Bangladesh goes through government parastatals. In the past decade or two, nearly all input provision has shifted over to the private sector. In most cases the private sector has responded by developing fertilizer and seed supply chains.

Surveys in India, China, Viet Nam, and Bangladesh show that private input suppliers provide nearly 100 percent of the fertilizer and chemicals that farmers use and a major share of improved seeds. In turn, a second-round effect has been the recent development of extension services by private input companies to farmers and the recent growth of private sector seed breeding and multiplication. These have been complemented by public sector seed breeding and extension services.

While governments initially subsidized and even marketed equipment, in particular tractors and irrigation pumps, these **equipment sectors have also been privatized and liberalized** with respect to both private investment and imports. As with the other inputs, the private sector has responded by producing pumps and other irrigation equipment at a massive scale with widespread diffusion. Governments have also **liberalized private, rural water markets**, which have increased private, rural investment in water infrastructure and pumps. Note that in many countries the pump industry has spurred the development of diesel motor industries, which has in turn created a positive, second-round effect to spur motorized vehicle diffusion in agricultural areas. These have combined to develop rural, non-farm enterprises, such as construction and transport.

(c) Policy evolved from governments directly providing agricultural credit to creating an enabling environment for **private sector provision of credit to farmers**. In the early stages of the Green Revolution in the 1970s and into the 1980s, public agrarian banks were crucial sources of credit. Many of these have been subsequently cut back or privatized, with finance sectors gradually liberalized. This spurred a substantial increase in private banking services to rural areas.

But perhaps as important, the sources of funds for investments by farmers have greatly diversified and expanded. Today, cash from RNFE and migration remittances have become major or even the leading sources of cash for rural investments. This is followed in second place by cash from sales of agricultural products, followed usually in a distant third place by informal credit or bank loans.

(d) Water strategy in the rest-of-Asia has, as elsewhere in the world, been contentious and sensitive, but has broadly evolved in the direction of the **establishment of incentives for efficient water use**. Such incentives may include market-based or administrative pricing of water and/or collective action through water user associations to move users toward water conservation and sustainable use. Of course, actual implementation and performance differ widely over countries. For water markets to function effectively, the original allocation of water rights needs to be defined, an institutional and legal framework for trade is needed, and the basic necessary infrastructure to allow water transfers must exist.

A number of Asian countries have implemented a broad, integrated, and participatory policy for agricultural-water management, including harvesting of surface water, mapping and increased utilization of groundwater supplies, small-scale irrigation, completion of irrigation infrastructure around completed dams, rehabilitation of existing schemes, and water control. This approach is a central part of China's current five-year plan, which has involved formation of water-user groups as stakeholder units.

More recently, threats to the environment and vulnerability to climate shocks, as well as the negative impacts of these on health and livelihoods, are being recognized as threats to agricultural development and economic progress. Some examples of key concerns include: destruction of forests that destabilizes watersheds; mismanagement of freshwater supplies; competition for water among agriculture, energy, industry, and households; increasingly erratic rainfall and temperatures, and the impacts thereof on agricultural seasons, yields, and production; saltwater incursions from reduced river flows; and effects of chemical residues on land and water (and ultimately health). These have economy-wide impact, with specific impact on soil fertility and agricultural productivity, and thus rural agricultural revenues and livelihoods. Southeast Asia's vulnerability to these risks is widely acknowledged.² Agricultural modernization strategies today must incorporate efforts to build diversification, resilience, sustainability, and risk management into the agrifood system.

(e) The rapid rise of farm output drove a huge expansion of the rest of the rural economy in Asia. In particular, it **increased rural non-farm employment**. As in the above discussion on input markets, many RNFE activities are also linked to the expansion of agrifood supply chains. Growth in urban food demand creates opportunities for supply

² For example, see ASEAN's statement on cooperation on climate change, <http://environment.asean.org/asean-working-group-on-climate-change/>.

chains to lengthen, strengthen, and deepen, which in turn creates opportunities for many specialized private actors to provide services at all points along the supply chains. This, in turn, has greatly expanded RNFE employment. Thus, farmers benefit from increased income-earning, while businesses and RNFE benefit from new business opportunities and expanded non-farm income generation.

The above two pillars relate to the “upstream” (production and input suppliers) actions by governments and the private sector in the rest-of-Asia. These actions led farmers to vastly increase food output with higher yields and diversified production. Those who continued with rice produced more than enough to feed urban and rural Asia, and those many who diversified their production into fish, meats, fruit, vegetables, dairy and pulses produced the mountain of non-grain products feeding Asia and exported to the rest of the world.

3.3. THE THIRD PILLAR: MODERNIZATION OF OUTPUT MARKETS AND AGRIFOOD SUPPLY CHAINS

Encouraging and enabling the development of agrifood supply chains from rural areas to cities and export markets was important to the growth of rest-of-Asia for two reasons. Supply chains are two-way flows. First, supply chains deliver food from rural to urban areas, feeding hungry towns and cities and keeping down food costs. They also deliver food to markets abroad, thus earning foreign exchange through exports. Lower food costs, in turn, are key to rest-of-Asia economies’ abilities to keep wage costs down and thus be cost-competitive in manufacturing. Second, supply chains carry output to cities and export markets and bring back money and market and technical information to farm communities. With that infusion of cash, farmers invest in their livelihoods and farm communities and also in making their natural resource bases more sustainable. More cash in rural areas in turn allows SMEs to expand and farmers to enjoy increased incomes and reduced poverty.

Governments encouraged and enabled the development of output markets and supply chains in two ways, i.e., via infrastructure investments and policy reforms, paralleling what governments did to encourage the modernization of small farms and input markets.

Regarding infrastructure investments,

(a) To spur output markets and supply chains, rest-of-Asia governments invested heavily in infrastructure to connect farmers to the “demand engines,” especially to rapidly growing urban markets, but also to intra-Asian and world demand. Investments were made along all four segments of the agrifood food system:

- In **rural areas**, the primary product supply zones;
- In **towns and intermediate cities**, which serve as crucial points for agricultural input and service provision, transit and a portion of final demand; they also

feature rural wholesale markets and infrastructure (such as electrification) needed for first-stage processing facilities;

- In **small and medium cities**, both of which are sites of wholesale markets, export interfaces, retail systems, and second-stage processing facilities, and crucial final demand points; and
- In **megacities** that constitute half of urban demand and include important sites for retail and wholesale systems and second-stage processing facilities.

(b) The most important types of investments – by governments, historically, but also increasingly by the private sector or by public-private partnerships – included: **roads, rail, and ports** connecting along the spatial continuum noted above; thousands of **wholesale markets** built in all four spatial segments, an extremely important investment; **electrification** serving all segments of the supply chains; **research, education, extension, and skill-building** related to logistics, packaging, processing, distribution, and trading; **security from corruption and crime** for the actors along the supply chains (although this has been applied quite variably across Asia); and **logistics infrastructure** in small towns, cities, and ports, such as in warehouses, loading docks, and bulk commodity transfer points to reduce transaction costs both in internal trade as well as in regional and international trade.

Thus, rest-of-Asia governments invested to link supply chain spatial segments, so markets could develop internally in an integrated fashion. Rest-of-Asia governments placed great emphasis on a range of hard infrastructure investments to develop internal supply chains that could be linked to export and import supply chains. This supported market decisions and investments by private food supply chain enterprises (transporters, storage agents, processors, wholesalers, retailers, and so on), crucial to “building the bridge” between the farmer and the rapidly growing market and bringing millions of farmers out of poverty.

Governments also enacted policies and regulations to enable and encourage millions of small, medium, and large private sector actors to invest in the building of the supply chains. The most important of these are the following:

(a) Governments followed the same path with output markets as they did with input markets. First, rest-of-Asia experienced an early phase of direct **government involvement in food marketing** (both domestically and in exports). This was followed in the 1990s and 2000s by a mass withdrawal throughout rest-of-Asia from that approach. Government involvement in food marketing as a direct agent has nearly disappeared in Southeast Asia, China, and Bangladesh, and only exists as a minor share of the market in India. This has fundamentally shifted from a “crowding out” to a “crowding in” of private sector supply chain activity, resulting in massive investments by small and medium all the way to large firms.

(b) Asian governments shifted from an initial phase of regulations barring or limiting foreign direct investment (FDI) in food distribution and food processing in the 1970s and 1980s to **liberalization of FDI** in the 1990s and 2000s. This has spurred major FDI in all segments of food supply chains, and with it, the transfer of technology and transmission of learning about best practices that have helped all stages of the supply chain to improve and grow. It has also spurred complementary investments in sectors ranging from modern telecommunications to modern food retailing via supermarkets. FDI as well has increased competition for local firms at various stages of supply chains.

(c) A close complement to the above two points is that Asian governments instituted a set of policies that have gradually improved the **business and investment climate** for both SMEs and larger firms operating along the supply chains. Important examples of these policies include **commercial regulations** regarding supply and labor contracts; **liberalization of trade quotas and tariffs, internal taxes, and removal of constraints on the movement of goods** inside countries; reduction of transaction costs by **eliminating red tape** of various kinds related to starting and running businesses; **intellectual property rights** and other investor and consumer protections; and, more recently, the establishment of **food safety regulations**, along with **product quality grading and standards**, with credible conformity assessment processes for testing and enforcement.

The results of these Third-Pillar investments and policies related to the midstream and downstream segments of the food system, and more generally output markets, have been spectacular in terms of mobilizing private sector activities. Three broad impacts are noted.

First, a Quiet Revolution has taken place in the development of food-supply chains throughout rest-of-Asia. Allowed by policy and supported by public investments in an enabling environment, thousands of SMEs in food processing, trucking and water-based transport, ice, storage, wholesaling, retailing, and food service have emerged and built supply chains all over Asia. Policymakers once thought that only government firms could do this and then thought that only foreign firms would. But the big surprise in the past 15 years has been the massive emergence and proliferation of these local private firms. With them has come millions of jobs, as well as more flexible, resilient, responsive, and competitive supply systems.

Second, a Modern Revolution has also occurred, with substantial private investment by domestic and foreign firms in the Asian food system. Among other things, this has spurred a supermarket revolution (which in turn has prompted substantial investments in modern logistics infrastructure, both hard – warehouses – and soft – computerized inventory tracking, transport, and communications systems), as well as the development of extensive food processing and wholesale sectors. It has “fast tracked” the modernization of food supply chains throughout Asia, leading to gains in food safety, quality, and consistency of supply. Large firms (such as Thailand’s CP Foods) have also invested in supply-chain risk management and resilience that are beneficial for the security of food supplies to Asian cities.

Finally, there has been a lengthening of supply chains so that the transmission effects of urban-market development (and export market growth) radiate out to hinterland areas, bringing increased incomes to farmers and rural areas. Moreover, modernization of the chain, combined with the proliferation of competition among SMEs, have driven down food costs to consumers in Asia.

4. Myanmar's Agricultural and Food Sector Today

Myanmar broadly matches the rest-of-Asia in basic initial characteristics – but with a crucial difference. Myanmar, despite having enormous potential, has made little progress over the last 50 years, while the rest-of-Asia has transformed its agricultural sectors. Although Myanmar's agrifood economy has recently taken some early steps toward modernization and increasing productivity and livelihoods, the country must quickly and systematically introduce the necessary policy reforms, public investments, and institutional capacity needed to boost its agricultural and food sector rapidly toward its fuller potential.

Myanmar's agrifood sector today can be characterized by the following observations:³

- **Urban demand for food** has taken off in Myanmar. The urban market is already half or more of the national market for a number of food items such as rice, fish, meats, fruits, and vegetables, and can be expected to continue to grow strongly.
- From a **nutrition** perspective, dietary diversification has started, but still falls short of the needs for many people living in Myanmar. Food consumption of Myanmar's poorest quintile has risen slightly, and certain micronutrient deficiencies (vitamin A, iodine) are under control, but others – such as iron deficiency anemia and infantile beriberi (vitamin B1 deficiency) – persist.
- Rural households have started to **diversify their livelihoods**, undertaking rural non-farm employment, local farm wage employment, and internal and external migration.
- Despite policies that still emphasize the priority of rice, farms have started to **diversify their agricultural production**, moving into non-rice food and industrial crops, which already account for 60 percent of farmed land in Myanmar, as well as into aquaculture and livestock production.⁴

³ For more detailed understanding of Myanmar's agricultural and food sector, see Than Tun, Adam Kennedy, and Ulrike Nischan, "Promoting Agricultural Growth in Myanmar: A Review of Policies and an Assessment of Knowledge Gaps," Washington, DC: International Food Policy Research Institute, November 2015.

⁴ This figure is from the 2003 agricultural census, cited in S. Haggblade et al., "A Strategic Agricultural Sector and Food Security Diagnostic for Myanmar," prepared for USAID (Yangon: Michigan State University and Myanmar Development Resource Institute's Center for Economic and Social Development, July 2013). It likely overstates the importance of paddy area, since conversion of paddy land to fish ponds has taken off in the intervening 12 years. In terms of value of production, the Food and Agriculture Organization suggests that paddy

- **Rural labor shortages and higher rural wages for labor** are increasingly observed in many parts of the country, an outcome of low birth rates, migration to cities, and outmigration to neighboring countries, combined with recent rapid economic growth.
- **Access to agricultural land** is constrained by a long-outdated and overly complex system for registration of land tenure claims and changes in ownership, land use permits, high land transfer taxes, and the near impossibility of registering collective and communal land tenure rights.
- Farms in some areas have begun to **intensify production** with irrigation, improved seeds, fertilizer, and labor-saving herbicides, and with the use of small-scale mechanization. Most production, however, is still manual and traditional, produced in one season without water supplementation. With rural wage rates rising, the profitability of Myanmar farming is in decline.
- **Irrigation water** is distributed free-of-charge to farmers, which gives them no incentive to conserve its use and provides no revenue for maintaining water distribution systems.
- Myanmar's **ICT revolution** is rapidly bringing affordable cell phone service to many rural areas. Penetration and use of the Internet, however, is still quite limited in rural areas and skills to use the Internet are lacking.
- **International and cross-border trade of agrifood products is inhibited.** Myanmar policies toward exports and imports of agrifood, particularly for rice and animal/meat products, are often restricted through government intervention. Exporters face *ad hoc* trade restrictions from neighboring countries. Cross-border trading arrangements, particularly with China, place local traders in disadvantageous positions. Trade interventions and weak trade facilitation reduce returns to Myanmar farmers and create food safety risks and social costs.
- **Rural-urban food supply chains**, as well as some export supply chains, have started to develop, with many characteristics of the Quiet Revolution emerging through the expansion of private SMEs and large firms, especially in transport, storage, wholesale, processing, and agriculture services. The Modern Revolution is in evidence, too, with supermarkets present in major cities and expanding, along with mini-marts, into secondary cities and towns.

Critically, while these observations represent the start of a range of positive trends, they are still limited in scope and are still far from reaching their full potential. A systematic, well-applied food and agriculture development strategy is needed in Myanmar to accelerate modernization and productivity in the agrifood sector. This, in turn, will help Myanmar to achieve the country's

contributes 39 percent of the value of agricultural production, crops and livestock products combined. This figure, too, excludes the value of aquaculture production and thus likely overstates the importance of paddy.

domestic economic and social goals as well as to raise its competitiveness in Asian and global markets.

5. A New Vision for Modernizing Myanmar's Agricultural and Food Sector

A systematic, forward-looking strategy for modernizing Myanmar's agricultural and food sector requires clearly defined objectives and implementing principles, with responsibilities effectively distributed and shared among government and the private sector (including farmers).⁵ In addition, the process for developing and implementing agricultural and food policy needs to be transparent, participatory, accountable, evidence-based, and free of corruption.

With these considerations in mind, we respectfully recommend the following high-level objective and implementing principles for a new “Vision for Modernizing Myanmar's Agricultural and Food Sector.” The strategy's recommendations are organized around the three pillars of the rest-of-Asia's successful agrifood development experiences described above, but are firmly grounded in Myanmar's current context.

5.1. Strategic Objective and Implementing Principles

Strategic Objective. This Vision aims to generate a more productive, responsive, and inclusive agricultural and food sector that is sustainable over time. Such modernization will generate jobs throughout the country, increase rural income and savings, stimulate investments in farms, rural SMEs, and people – combining to create a virtuous cycle that can pull millions out of poverty, while providing affordable, stable supplies of food with rising food security and nutrition for all.

Implementing Principles. In order to generate a modern, thriving agrifood sector in Myanmar, we recommend implementation of the policy recommendations listed in the matrix to adhere to the following principles:

- **Facilitated by government, driven by the private sector.** Government provides the policies, institutions, and public infrastructure needed to enable farmers and the rest of the private sector along supply chains to invest, become more productive, and meet consumer demand.
- **Emphasis on smallholder farmers and SMEs.** Focus will be on small farmers and SMEs as the core drivers of growth, equipped with inputs, technologies, and market information to make informed decisions about what is best for them to produce, enabled by investments from larger domestic and foreign-owned businesses, and overseen by strong, smart, supportive government institutions.

⁵ Once the reorganization of the government has been completed, it will be important to clarify which ministries will have authority over which issues. As well, it will be important to understand which technical committees in parliament will handle which areas. And further, new leadership and parliaments at the state and region level and the possibility of change in authorities at local levels must be taken into account.

- **Transparency, participation, accountability, and ethics.** These principles should govern the process of policy development, communication, stakeholder outreach, and the monitoring of implementation of those policies at all levels of government. Implementation of all policy processes should respect the highest ethical standards, enforced by strong anti-corruption measures.
- **Environmental and social sustainability.** Agriculture and food production has environmental impacts, and this sector is affected importantly by environmental impacts from other sectors. Collective decisions must be made to balance needs for growth and income generation across the economy relative to short- and long-term environmental and social impacts.
- **Systematic approach to agriculture and the agrifood sector.** Agricultural and food sector modernization should encompass not only crop agriculture, livestock, and irrigation, but also fisheries and forestry/agroforestry. The agriculture ministry also needs to consider not only production-level issues, but also broader issues of output markets and supply chains, including trade and business enabling environments. Success in one area requires balanced attention to the other two.
- **Intra-government coordination for improved policymaking and implementation.** Coordination of policymaking and implementation among and within ministries, between government and parliament, and between Union and sub-national authorities, avoiding traditional silos, is essential for best results.
- **New institutional structure, capacities, and responsibilities.** Consolidation of the agriculture and livestock ministries provides a unique opportunity to re-think the full organizational structure of the newly integrated ministry. To be fully in line with the new Vision will require new departments or divisions, human resources, tools, and practices, and shifts in budgets to reflect new priorities.
- **Prices matter.** Price analysis should be integral to the policy work of the new ministry, crucial as Myanmar transitions to greater reliance on supply and demand forces to allocate resources. This will require greater capacity to collect, analyze, and understand price signals, including understanding the impacts of exchange rates, tariffs and other trade interventions, elasticities of demand and supply, foreign market movements, and other factors on the incentives faced by all agrifood actors in Myanmar
- **Monitoring the effectiveness of policy implementation enhances accountability.** Given the new government's commitment to transparency and accountability, the Ministry of Agriculture, Livestock, and Irrigation should develop indicators to quantify the impacts of investments and policy reforms on agrifood sector segments, on interest groups (landless, smallholder producers, rural non-farm enterprises, downstream supply chain actors, rural consumers, food consumers), by state and region, and throughout the supply chain. This will ensure that policies are implemented effectively to achieve

desired outcomes; if they are not, adjustments can be made to avoid waste and possible unintended consequences.

5.2. Setting Priorities and Sequencing Reforms

All actions recommended in this paper are important, but not all policy reforms and institutional innovations can be acted upon at once. Many policy reforms of the highest priority, for example the need for a comprehensive land law, should be addressed immediately by announcing the government's intended, broad policy directions, while acknowledging that developing a law and creating complex institutions and processes for implementation will take time before having a direct impact on people in practice. Crafting clear communications from the government regarding its expected policy directions will be essential in the early days of the new government.

More information and deeper analysis is required to put many of these recommendations into practice. In some cases, such analysis is readily available, in other cases data and analysis will need to be developed. As well, it will be important to identify priorities and the best sequencing of reforms, relative to the potential impact of each recommendation but also relative to budget constraints and current institutional capacities. Further, it will be important to clearly define responsibilities among different government ministries (and departments within), with the parliament, and with authorities and parliaments in states and regions reaching down to local administrations. In addition, it will be important to highlight where leadership and actions are required by farmers and the private sector (private groups cannot be forced to act, but they can be enabled and provided with appropriate incentives and opportunities).⁶

5.3. Recommendations for Policy Reform, Investment in Infrastructure, and Institutional Innovation for Modernizing Myanmar's Agricultural and Food Sector

The matrix below provides a systematic set of recommendations for policy reforms, infrastructure investments, and institutional innovations by government and the private sector to implement this new Vision for Modernizing Myanmar's Agricultural and Food Sector.

These recommendations build upon lessons learned from other Asian countries and from assessments of the current policy regime in Myanmar. Through the three-pillar approach, many challenges and recommendations are introduced that extend well beyond issues handled by the previous Ministry of Agriculture and Irrigation.

⁶ At the time of the publication of this paper, a major reorganization of government had just been announced, making it difficult to assign responsibilities among government ministries.

THE NEW VISION’S STRATEGIC OBJECTIVE AND APPROACH: The objective of the New Vision is to improve the incomes and livelihoods of rural communities while increasing the availability of more stable, diversified, and nutritious diets to consumers. This objective can be achieved by empowering smallholder farmers, equipping them with knowledge and technical inputs, and connecting them to urban and global markets.

The strategic approach focuses on developing the policies, physical and social infrastructure, and institutional and human resource capacities needed to generate a more productive, responsive, and inclusive agricultural and food sector that is sustainable over time. Effective application of this strategy can generate jobs throughout the country, increase rural income and savings, and stimulate investments in farms, rural SMEs, and people – combining to create a virtuous cycle that can pull millions out of poverty.

Achieving that objective requires an overarching implementing principle for agrifood sector governance that is built on transparency, stakeholder participation, accountability, and the highest ethical standards at all levels of government, from the Union, through all states and regions, to local areas. It is recommended that (i) 60-day public comment periods be required before policy decisions are finalized, and (ii) all policies, laws, and regulations be published and made widely accessible to everyone in Myanmar.

The matrix below provides a systematic set of recommendations, organized around the three pillars, to operationalize the New Vision.

Matrix of Recommendations for Policy Reforms, Infrastructure Investments, and Institutional Innovations

Priorities	Actions
PILLAR ONE: MODERNIZING SMALL-FARM PRODUCTION	
POLICIES AND REGULATIONS	
a) Enable farmers' freedom to choose which agricultural products to produce.	<p>a.1) Affirm through appropriate ministerial orders and ministerial statements/objectives that farmers are free to choose how they use their land and labor, and embed this freedom over time in relevant new laws and regulations that are produced; see Pillar Two, section a) on reforming land classifications, which are key for allowing farmers to decide how best to use their land.</p> <p>a.2) Equip farmers with the information and capacities needed to make informed decisions on their choice of farming activities and methods (for example, technically, economically, and environmentally feasible farming systems, and access to market information and trends). Sections below provide more detail.</p> <p>a.3) Eliminate land use regulations that restrict owners of paddy land who wish to grow other cash and industrial crops (for example sugarcane) as well as aquaculture, particularly for smallholder farms sized 10 acres or less.</p> <p>a.4) Facilitate the emergence of voluntary farmer organizations to empower farmers in marketing and resource use as well as engagement on government policy and regulatory issues.</p>
b) Invest in infrastructure for physical and virtual connectivity in rural areas.	<p>b.1) Assess and improve investments in and regulation of wholesale markets, abattoirs, cold storage, cold chain transport, irrigation (<i>water issues are discussed in more detail under Pillar Two</i>), rural roads, rural electrification, etc.</p> <p>b.2) Improve rural transportation infrastructure, integrating rural transport needs into existing national transport plans. For example, develop farm roads and access roads from villages to larger roads linked to markets throughout the country, with particular consideration for isolated and</p>

Priorities	Actions
	<p>border areas.</p> <p>b.3) Create a regulatory framework that supports private investment in rural transport.</p> <ul style="list-style-type: none"> • Remove all restrictions on internal movements of agricultural goods within and between states and regions, and all fees or taxes associated with such movements. • Review policy on road tolls, with a view to reducing transport costs and times. <p>b.4) Use modern ICT tools at all levels of the agricultural and food sector, including:</p> <ul style="list-style-type: none"> • Use digital networks to collect, analyze, process, and publish agricultural sector statistics. • Use cell phones and the Internet to access and distribute information on markets (prices, standards, and specifications), weather, and agriculture technology and knowledge. • Use cell phones to interact more effectively with extension advisors and distribute extension services to farmers in a more timely and effective manner (for example, to optimize seeding windows, fertilization given location and soil maps, use of agrochemicals for plant protection). • Use soil sensors and cell phones to advise farmers on optimal water supplementation. • Use radio-frequency identification by logistics providers to manage agricultural commodity and food product movements. • Create digital maps to analyze spatial distribution of rural populations, farms, farm types, land holdings, climate, water use, storage facilities, and markets in order to improve the effectiveness of investments in infrastructure, including transport, storage, and processing. <p>b.5) Ensure adequate Internet capabilities to enable modern logistics practices (storage, inventory, and distribution tracking).</p>

Priorities	Actions
c) Promote adoption of mechanization for land preparation and cultivation practices.	<p>c.1) Encourage farmers to consolidate their fields (including farm roads, drainage, irrigation networks, and land leveling) to promote mechanization of land preparation, seeding, and transplanting, as well as harvesting. In irrigated areas, this action could be promoted by water user associations.</p> <p>c.2) Improve the enabling environment for private financial institutions (and others, such as input suppliers and buyers) to expand credit to farmers and SMEs to purchase machinery and expand options for leasing and renting equipment, enabling the use of expensive equipment among a number of farms (see Pillar Two, section c).</p>
d) Innovate and build organizational and human capacity of government agricultural institutions.	<p>d.1) Enhance coordination, transparency, and accountability among and within ministries, as well as with farmers, agribusinesses, and civil society, to ensure effective development and delivery of public goods.</p> <p>d.2) Develop ministry capacity to undertake agricultural economic analysis to guide policy decision-making and disseminate information to all stakeholders in the agrifood sector.</p> <p>d.3) Improve collection and dissemination of agricultural statistics, including crop, livestock, fisheries, and forestry data, undertaking periodic agricultural surveys and a census every 10 years.</p> <p>d.4) Create an e-agriculture unit in the Ministry of Agriculture, Livestock, and Irrigation (MOALI) to develop an e-agriculture strategy to use innovative ICT tools to increase the flow of technical and market information among government, farmers, and agribusinesses (following some of the ideas presented in Pillar One, section b.4).</p> <p>d.5) Develop (or revive) effective education, training, and research institutions to build human capital in the agricultural and food sector by upgrading skill development programs in agricultural sciences, logistics, and agribusiness. Closely coordinate education and training with the evolving needs of farmers and the private sector in rural areas.</p>

Priorities	Actions
	<p>For higher education:</p> <ul style="list-style-type: none"> • Upgrade and rationalize the current Yezin Agriculture Universities into one consolidated university with colleges for agriculture, livestock, and aquaculture with both undergraduate and graduate degrees. Upgrade key sectoral disciplines in Yezin and other universities, including agricultural economics, agricultural business and marketing, agriculture engineering, water management, food technology, and agricultural extension and communications. <p>For applied education and training:</p> <ul style="list-style-type: none"> • Expand the 3-year diploma curriculums of State Agricultural Institutes (SAI) in all states and regions to provide training on all key sectoral disciplines, including agriculture, livestock, fisheries, machinery, food technology, farm management, agribusiness and marketing. Expand these institutes' offerings to include short-term certificate training as well. • Revive high school level agricultural training and other vocational training institutions, both public and private. <p>d.6) Assess, reorganize and upgrade applied research farms and stations, particularly for livestock and aquaculture, as well as building human capacity for research.</p> <p>d.7) Establish an Agricultural Research Council, as well as an Institute for Policy Studies in Agriculture and Rural Development, and reinstate the Academy of Agricultural Sciences to strengthen and integrate academic, research, and policymaking capacities in the agricultural and food sector.</p> <ul style="list-style-type: none"> • Ensure bridging and strong links between agricultural research and extension services. <p>d.8) Build upon the current structure to upgrade the agricultural extension system to provide the technical and market information needed by more diversified small-scale farmers in all parts of the country, with greater communication and accountability with farmers as clients. Agriculture extension services need to be available for all subsectors, including crops, livestock, aquaculture, and agroforestry.</p>

Priorities	Actions
	<ul style="list-style-type: none"> • Work with vocational training centers to provide in-service training to upgrade the most important capacities of the current group of extension officers. • Steadily expand the number of extension officers, including subject matter specialists (SMS), and provide strong orientation training as well as in-service training over time. • Equip and raise capacities for extension officers to use ICT tools and the mass media (TV, radio, and social media) to more effectively communicate with farmers and other key stakeholders. • Develop collaborative programs between private sector stakeholders and agricultural extension service providers to provide technical information regarding good agriculture practices.
PILLAR TWO: MODERNIZING INPUT MARKETS	
POLICIES AND REGULATIONS	
a) Provide farmers with greater land tenure security over agricultural lands .	<p>a.1) Develop a comprehensive land law using an inclusive, multi-stakeholder public consultation process and taking into account the National Land Use Policy.</p> <p>a.2) Simplify the land use classification system to only three broad categories: agricultural, forest, and other lands. Eliminate more specific classifications that complicate farmer decision-making regarding what to grow on land; that is, allow farmers to use their land for whatever agricultural uses they see fit to enhance their income within land designated for agricultural use.</p> <p>a.3) Prioritize enforcement of the Vacant, Fallow, and Virgin Land Law to return undeveloped agricultural land to small holders and landless people.</p> <p>a.4) Develop accurate and up-to-date digital information systems (for example, electronic land registration systems) and maps for land (for example, combine spatial data of government departments and development organizations to integrate and digitalize land use maps), and establish</p>

Priorities	Actions
	<p>procedures and institutional arrangements to resolve land disputes.</p> <p>a.5) Simplify and streamline systems and procedures for the emergence of a land market to make it easier for farmers to use land assets. Give farmers greater land tenure security over agricultural lands that include the ability to buy, sell, mortgage, lease, and inherit land.</p> <p>a.6) Improve public access to information on agricultural land policies, laws, and regulations, as well as on agricultural land institutions, dispute resolution, transactions, and other records.</p> <p>a.7) While waiting for a new land law, allow pilots that introduce greater flexibility in land use; for example, allow farms under 10 acres greater flexibility to use paddy land for aquaculture and other cash crops.</p> <p>a.8) Develop a mapping system of agro-ecological zoning of climate, soil, water, and land resources to enable better identification of potential farming systems by zone, which in turn will facilitate more targeted recommendations of varieties, input packages, irrigation needs, etc. by extension officers and private input suppliers.</p>
<p>b) Enact policies to liberalize Myanmar's seed, fertilizer (and other agro-chemicals), and equipment markets.</p>	<p>b.1) Continue seed policy reform to permit private sector companies, including multinational companies, to develop and to import and export seeds, subject to appropriate certification.</p> <ul style="list-style-type: none"> Facilitate public comments on the draft implementing regulations and procedures for the Amended Seed Law. <p>b.2) Streamline and facilitate registration and certification of products to improve access to imported inputs.</p> <ul style="list-style-type: none"> With regard to seed, all varietal testing and certification of multiplied seed must be undertaken by government, whose staff resources and laboratory facilities are inadequate. Options would be to allow evidence submitted to national seed committees elsewhere in ASEAN be accepted as equivalent to testing in Myanmar, or to outsource certification functions to accredited private seed certification laboratories.

Priorities	Actions
	<p>b.3) Enforce the Law on Fertilizer and Law on Pesticides, and approve and approve and implement a modern law on trademarks, to ensure proper testing and enforcement processes to prevent circulation of counterfeit, adulterated or mislabeled products.</p> <ul style="list-style-type: none"> • Equip farmers with better understanding of appropriate fertilizer and pesticide use, and build staff, testing, and enforcement capacities.
<p>c) Create an enabling environment for private sector provision of financial services to rural-based individuals, farms, and rural enterprises.</p>	<p>c.1) Develop an agricultural finance policy that encourages banks, microfinance institutions (MFIs), non-bank financial institutions, such as leasing and finance companies, and insurance companies to provide needed services to rural communities, especially farmers and SMEs. This must be done in close cooperation with the Myanmar Central Bank and the Ministry of Planning and Finance.</p> <ul style="list-style-type: none"> • Develop implementing regulations for the recently approved Financial Institutions Law, and ensure strong input by agricultural and food sector ministries and private stakeholders in this process. • Make critical regulatory reforms for banks to expand credit (among many other needed regulatory reforms): <ul style="list-style-type: none"> ○ Allow flexibility on taking collateral for loans (allowing the use of movable assets as collateral or in some cases allowing loans based on the viability of business plans and borrower's track records); ○ Allow loans with terms greater than one year; and allowing interest rate flexibility. • Over time revise the Law on Microfinance, but in the short run implement a number of key regulatory reforms for MFIs to mobilize greater amounts of rural savings and credit. (The MicroFinance Association has a detailed White Paper with recommended reforms to accelerate growth in the MFI sector, which has the potential for rapidly increasing the provision of much needed financial services in rural areas.) These would focus on: <ul style="list-style-type: none"> ○ Expanding MFI sources of funding through expanded deposit taking and more flexible

Priorities	Actions
	<p>borrowing from domestic and foreign banks and other funding sources,</p> <ul style="list-style-type: none"> ○ Increasing interest rate flexibility, and ○ Expanding the range of financial services provided by MFIs. <p>c.2) Approve key regulations that would allow growth in e-money or mobile money (which allows the cell phone companies to mobilize their investments in cell phone connectivity to provide low-cost access to financial services) and e-banking, which can greatly increase access of low-cost financial services to farmers and others in rural and otherwise isolated areas where the costs are high to reach traditional brick-and-mortar financial service offices.</p> <p>c.3) Develop creditworthiness information systems that make it easier to provide credit to viable farmers and SMEs without full collateral backing.</p> <p>c.4) Return control of the Myanmar Agricultural Development Bank (MADB) to the Ministry of Planning and Finance.</p> <ul style="list-style-type: none"> • Allow the MADB to perform as a development bank as provided for under the Myanmar Agricultural and Rural Development Bank Law (1990). • Develop a rational business model that takes into account the needs of farmers relative to expanding commercial finance options and that clearly accounts for any subsidization. • Consider options for privatizing or dramatically changing the MADB's corporate governance, including establishing an autonomous board of directors. • Allow MADB to offer longer term loans and allow loans beyond seasonal credit for specific crops.
d) Develop strategies for efficient and sustainable resource use, climate change, and disaster	d.1) Develop an integrated approach augmented by research and stakeholder dialogue for sustainable land and water use, balancing environmental and economic impacts of agricultural production.

Priorities	Actions
management.	<ul style="list-style-type: none"> Effectively employ environmental and social impact assessments for major investment projects. <p>d.2) Prepare a comprehensive plan for water use that encompasses rainwater harvesting, groundwater, irrigation, water control, and rural electrification, incorporating engineering, economic, and user inputs.</p> <ul style="list-style-type: none"> Develop proposals to incentivize and promote use of water-saving technologies to ensure efficient use of water by the agricultural sector. Rehabilitate existing irrigation infrastructure, emphasizing technologies that make more efficient use of irrigation water. Make irrigation systems more demand-driven rather than focusing on supply management; promote small-scale irrigation suitable for non-rice crops. Re-establish water user groups to emphasize participatory decision-making on water use. <p>d.3) Create rural communities resilient to effects of climate change and disasters.</p> <ul style="list-style-type: none"> Develop collaborative programs among communities, the government, the private sector, and civil society to increase awareness of the latest research and available technologies to improve farmers' abilities to cope with increased climate variability.
e) Promote rural non-farm employment and develop strategies to help rural communities adapt to rural labor shortages .	<p>e.1) Promote business enabling environments that will encourage private investment in value-added agribusiness activities in rural areas to create job opportunities. See Pillar III on the business environment.</p> <p>e.2) Develop a coordinated approach to provide skills training to rural labor, to promote use of modern inputs, equipment, technology, and information in rural non-farm enterprise and to promote off-farm entrepreneurship.</p> <p>e.3) Develop secondary and university education programs to provide skilled workers for agriculture and agribusiness occupations (see Pillar I).</p>

Priorities	Actions
	<p>e.4) Study the extent to which rural labor shortages are affecting production – at the state and region level, by crop and non-crop activities, and relative to on- and off-farm activities.</p> <p>e.5) Develop labor-saving strategies for farmers through the use of appropriate technologies, farming systems, and staggered timing of required labor inputs. (This cross-cuts with Pillar One on agricultural research.)</p>
PILLAR THREE: MODERNIZING OUTPUT MARKETS & SUPPLY CHAINS	
INFRASTRUCTURE INVESTMENTS	
<p>a) Invest in supply chain infrastructure along all spatial segments of the food supply chain.</p> <p><i>Spatial segments include (1) rural areas (primary product supply zones); (2) towns and intermediate cities (crucial agricultural input and service provision points, and transit points); (3) Yangon; and (4) the ports.</i></p>	<p>a.1) Focus immediately on removing the traffic/truck congestion on the road from Mandalay to Muse to facilitate exports to China. Improve inland water transport and develop a systematic approach to improve the efficiency of the Yangon area ports and connecting trucking logistics.</p> <ul style="list-style-type: none"> • Improve infrastructure around key land border crossings. <p>a.2) Upgrade wholesale market infrastructure (design of stalls, energy needs, waste management, logistics facilities) in key locations.</p> <p>a.3) Ensure access to and reliability of electricity and Internet in rural areas.</p> <p>a.4) Improve transport and logistics infrastructure in small towns and cities, including warehouses, cold storage, truck management, and ICT connections for distribution tracking, with major contributions by the private sector.</p> <ul style="list-style-type: none"> • Expect transport and logistics companies to invest and upgrade as users increase demand for their services and pay higher fees, shifting logistics services from a cost to a competitive form of value-added.

Priorities	Actions
	<ul style="list-style-type: none"> Enhance research, education, extension, and skill-building related to logistics, packaging, processing, and distribution. <p>a.5) Improve security (from corruption and crime) for the actors along the supply chains.</p>
POLICIES AND REGULATIONS: PRODUCT MARKETS	
b) Modernize meat and dairy industries.	<p>b.1) Develop a new integrated policy on livestock development to promote modern meat and dairy industries, including improved access to animal health services for livestock.</p> <p>b.2) Amend the 1947 Essential Supplies and Services Act to remove “cattle” from the list of essential supplies in order to eliminate restrictions on slaughterhouses and cattle/meat transport between townships and districts.</p> <p>b.3) Integrate livestock interests into land policy reform discussions.</p>
c) Promote sustainable natural resource governance for capture fisheries.	<p>c.1) Promote community-based natural resource management for small-scale inland and inshore marine fisheries by establishing local fishery organizations with support from the fisheries department.</p> <p>c.2) Regulate offshore fisheries based on scientific management principles to reduce over-exploitation; control illegal, unreported, and unregulated fishing; and improve product traceability; for example:</p> <ul style="list-style-type: none"> Set numbers of licenses to be granted for deep-sea fishing vessels based on periodic, scientific stock assessments. Require mandatory installation of GPS-based, vessel monitoring systems. Undertake systematic monitoring and documentation of catch volumes and composition at landing sites. Increase the number of naval patrols to discourage fishing in Myanmar waters by illegal foreign

Priorities	Actions
	<p>vessels.</p> <p>c.3) Establish marine protected areas for marine biodiversity, based on inclusive marine spatial planning processes, with co-management by fishing communities; develop ecotourism to support livelihood diversification as an alternative to environment degrading activities.</p>
POLICIES AND REGULATIONS: BUSINESS-ENABLING ENVIRONMENT	
d) Improve the business environment for all segments along the supply chain.	<p>d.1) Improve the legal institutions for commercial and labor contracts, especially for various kinds of contract farming systems; develop mediation and arbitration services to resolve contract disputes that are accessible in rural areas; improve the court system to resolve the full range of commercial disputes.</p> <p>d.2) Eliminate unnecessary internal taxes, road and bridge tolls, and permits to make it easier to move goods within the country.</p> <p>d.3) Reduce transaction costs by eliminating red tape (that is, overly complex procedures) related to starting and running businesses.</p> <p>d.4) Develop implementing regulations for the Law on Consumer Protection and operationalize public and private processes for resolving consumer complaints.</p>
e) Promote domestic and foreign investment in supply chains.	<p>e.1) Approve the draft Investment Law and develop implementing regulations that encourage responsible investors, both domestic and foreign (including 100% foreign-owned firms), to develop or expand businesses throughout the relevant agricultural and food supply chains; provide domestic investors with the same rights and incentives as foreign investors.</p> <ul style="list-style-type: none"> • Reduce sectoral restrictions that prevent entry of private investors by creating a transparent and short negative list of restricted investment sectors. <p>e.2) Strengthen the capacity of Myanmar Investment Commission to expedite investment</p>

Priorities	Actions
	<p>applications while effectively taking into account environmental and social impact assessment.</p> <p>e.3) Design and implement an investment promotion strategy for the agricultural and food sector.</p>
<p>f) Protect intellectual property rights for the agricultural and food sector.</p>	<p>f.1) Develop, approve and implement a plant variety protection law that is consistent with the requirements of the International Union for the Protection of New Varieties of Plants (UPOV). Ratify (or accede to) the 1991 Act of the UPOV Convention.</p> <p>f.2) Approve the draft Trademark Law and implementing regulations to enable protection for geographical indications, certification marks, and trademarks for agricultural/food products.</p> <p>f.3) Strengthen intellectual property right (IPR) protection against counterfeit agricultural inputs, especially for pesticides, including stronger border control measures to reduce the import of counterfeit products.</p> <p>f.4) Approve the Patent Law to protect domestic research and innovators in the agriculture and food sector.</p>
<p>g) Develop a strong quality infrastructure for the agricultural and food sector.</p>	<p>g.1) Develop product standards and certifications, quality grading, quality control measures, and reliable conformity assessment (testing) procedures; create a reliable quality infrastructure system that will help farmers and food processors to get higher prices for higher quality goods, incentivizing quality upgrading.</p> <ul style="list-style-type: none"> • Revise the Law on Standardization to introduce key international best practices and transparency requirements for the development of standards, conformity assessment processes, and technical regulations, and enable the establishment of a national accreditation bureau for testing processes and a national metrology institute for measurements. • Support the National Standards Council to expedite the passage of key national standards related to agriculture (including meats, fish, etc.) and food processing sectors, based on widely accepted international standards (including Codex Alimentarius standards for food, and related Hazard Analysis Critical Control Point (HACCP) standards and Global Good

Priorities	Actions
	<p>Agricultural Practice (GAP) standards).</p> <ul style="list-style-type: none"> • Improve the quality standards, testing laboratories, skills, and awareness for agricultural and processed products to be in line with international best practices and those used by major export destinations where possible. <p>g.2) Approve draft revisions to the Law on Metrology to establish a more coherent and reliable system of measurements in Myanmar; complete the process of metrication to which Myanmar committed in 2011, including in traditional food markets.</p> <ul style="list-style-type: none"> • Support the development of public and private calibration capacities to ensure the use of accurate testing/measurement equipment.
<p>h) Liberalize and facilitate imports and exports; upgrade trade diplomacy capabilities to protect Myanmar exporters.</p>	<p>h.1) Greatly reduce licensing requirements for imports and for agricultural and food exports.</p> <ul style="list-style-type: none"> • As has been done for beans and pulses, eliminate export licenses for all agricultural exports. • Rationalize import licensing requirements for imports of agricultural products and inputs to agricultural and food production. Develop a short and transparent negative list of products requiring sector-specific import licenses. • During times of food crisis it is better to encourage use of safety nets and food aid distribution to reach the needy than to impose trade restrictions that affect the entire market and that can jeopardize Myanmar's longer-term reputation as a reliable supplier in regional and global markets. • Approve the draft Law on Safeguards and implement processes to moderate surges in agricultural imports. <p>h.2) Develop more effective trade facilitation capacities to reduce the cost of clearing goods through customs and border control.</p> <ul style="list-style-type: none"> • Streamline and automate non-tariff measure processes, including for sanitary and

Priorities	Actions
	<p>phytosanitary (SPS) and technical barriers to trade (TBT) measures. Complete the customs automation program and integrate approvals of non-tariff measures into a National Single Window (NSW) for customs clearance, linking the NSW to the ASEAN Single Window.</p> <p>h.3) Upgrade customs clearance processes and logistics facilities for key land border crossings. Negotiate with neighboring countries to improve the trading regime at land-border crossings.</p> <p>h.4) Improve processes for transiting products through Myanmar, especially from Yangon to Muse. Implement the ASEAN Customs Transit System.</p> <ul style="list-style-type: none"> • Develop plans for handling surges in transit goods since China increasingly uses Yangon ports as an entry point for transiting imports through Myanmar into growing markets in western China. <p>h.5) Implement an agricultural export promotion program, providing information to farmers and processors about export opportunities and requirements and promoting Myanmar products in targeted foreign markets.</p> <p>h.6) Develop the capacity for more effective trade diplomacy in government, and of the private sector to participate therein, to protect national interests in international trade organizations important for agriculture and food, including the World Trade Organization and the ASEAN Economic Community.</p> <ul style="list-style-type: none"> • In particular, build capacities to negotiate more effectively with neighboring countries to reduce situations in which Myanmar exports are restricted.
<p>i) Ensure the health and safety of crops, animals, and people through the development and enforcement of new legislation on food safety and sanitary and</p>	<p>i.1) Modernize the Food Law and develop effective implementing bylaws and regulations as quickly as possible; ensure use of risk-based enforcement and use of international standards.</p> <p>i.2) Develop sanitary and phytosanitary regulations in line with international practices to protect crop and animal health in Myanmar.</p> <ul style="list-style-type: none"> • Negotiate SPS protocols with key trading partners to facilitate exports.

Priorities	Actions
phytosanitary measures.	<ul style="list-style-type: none"> • Apply legitimate policy objectives based on international standards wherever possible with minimum compliance costs and unnecessary impacts on trade. <p>i.3) Support the private and public sectors to develop accredited inspection and conformity (testing) assessment processes in line with international standards.</p> <p>i.3) Build capacities to trace production processes back to primary inputs for agricultural and food products, both for implementation of health measures for food safety as well as crop and animal safety, and also to meet government and private sector requirements for traceability in countries where Myanmar exports agricultural and food products.</p>

Glossary of Technical Terms

Agricultural is used in this paper in a “full sector” sense, including annual and perennial crops, both food crops (including grains, pulses, oilseeds, fruits and vegetables, sugar crops) and industrial crops (such as rubber, tea and coffee, cotton and other fibers, tobacco, betel nut), livestock (poultry, pork, beef, mutton, eggs, dairy), fisheries (both aquaculture and wild-catch), and forestry/agroforestry.

Agricultural and food economy (or “agrifood sector”) means the full set of sectors of the agrifood system or supply chain, including (1) the upstream segment of farm input supply; (2) the upstream segment of agricultural production; (3) the midstream segment of rural and urban brokers/wholesalers (for domestic and foreign trade markets), logistics enterprises, and first and second stage processors; and (4) the downstream segment of retailers and restaurants/food service sector.

Becoming cost-competitive in manufacturing: As countries grow, they shift from being agriculture focused to being more industry focused. This “East Asian Miracle,” the term used to capture the ways in which countries from Japan to Viet Nam have transformed their economies, used on low-cost labor as a distinct competitive advantage. The shift of labor from agriculture into manufacturing first required higher productivity of agriculture, so that more food could be grown with fewer people. This freed people who were willing to move from rural areas into cities to work in factories that needed low-cost, low-skilled workers for their assembly/processing lines to be competitive.

Elasticities reflect the sensitivity of producers or consumers to changes in price. A good that is absolutely essential to consumers or whose supply cannot be increased easily is said to be more “inelastic” (in demand or supply), while a good for which acceptable substitutes exist (in Myanmar, for example, fish and pork may be considered imperfect protein substitutes in the diet) or whose supply can be easily increased within one cropping cycle is said to be more “elastic” (in demand or supply).

Green Revolution refers to the global progress achieved in raising plant yields and thus total production of basic food grains such as rice, maize, and wheat. The Green Revolution was achieved through public-private partnership funding of international agricultural research and training of agricultural scientists. Research stations developed new plant varieties that responded with higher yields from water, fertilizer, and cultivation techniques compared to traditional varieties. Rapid adoption of these new varieties and production techniques by farmers allowed the world to make significant strides in fighting hunger and famine.

Input markets: The term input markets includes all inputs into the agrifood sector. Economists normally distinguish between two types of inputs used to produce an output: (1) factors of production in the form of land, labor, and capital; and (2) intermediate inputs, such as seed, fertilizer, other agro-chemicals, machinery, and the like. Water is another important natural

resource input. These are differentiated because factors of production are thought of as being non-tradable, which means their domestic supply is fixed, whereas intermediate inputs are considered tradable, which means their domestic supply can be augmented through imports. Some of these tradable and non-tradable classifications are increasingly being questioned, for example, in the cases of labor, water, and financial capital, which do cross borders.

Liberalization refers to a reduction of government control over some market functions. A market that is highly controlled by government may be one in which the government is the only buyer or seller of a good or service, where it sets prices of the good or service, controls who can be involved in the market or restricts trade (either imports or exports) affecting the market, and so on. In contrast, a liberalized market is one in which multiple buyers or sellers interact in the market, prices are determined by the interaction of supply and demand, and greater competition exists both in terms of who can be involved in the market and the extent to which trade flows interact with the domestic market. In most cases liberalized markets work better when government oversees “the rules of the market,” i.e., puts in place and enforces compliance with policies, laws, and regulations. Such a system of economic governance promotes fair markets, whereby all actors have equal access to information, resources, markets, and systems of dispute resolution, and whereby all actors are required to follow the same rules of measurement, quality norms, safety standards, and commercial contracts, and where abuses of market power are limited through competition policy.

Malnutrition can be thought of in two ways: (1) in terms of total calories required for sufficient energy; and (2) in terms of the availability of specific micronutrients (for example, vitamins and minerals, including vitamins A, B₁₂, and D, and iron and iodine) needed for appropriate growth and physical function. With rising incomes and a shift into preferred foods, rest-of-Asia’s diets have improved in both dimensions.

Productivity refers to the amount of output given a unit of input. For example, the physical productivity of land is measured in terms of yield (for example, x kilograms per hectare), whereas labor productivity is measured in terms of return per unit of labor (for example, net income earned per hour or day of work).

Small-farm production: Detailed statistics on the distribution of farm sizes in Myanmar are not available. The World Bank, in its April 2015 project appraisal document for its Agricultural Development Support Project, stated that about one-third of Myanmar farms are smaller than 1 hectare, another one-third are 1-2 hectares, and the remaining one-third are 2-7 hectares in size, with an average farm size of 2 hectares, the second largest in East Asia after Thailand. The World Bank’s December 2014 report on ending poverty in Myanmar noted that “poverty in rural Myanmar is closely associated with landlessness or functional landlessness – cultivation rights to less than 2 acres of cultivable land – particularly in the Delta, Coastal, and Dry Zones. The rural landless and marginal farmers (with cultivation rights to less than 2 acres of land) constitute two-fifths of Myanmar’s population, but make up over half the poor” (p. 24).

Subsidies are the practice of selling something at below-cost or distributing something for free. The practice has fiscal, distributional, and resource use consequences. The cost of inputs must be borne somewhere in the economy, for instance, through government budgets. Subsidies have a long history of not reaching their intended beneficiaries, for example, with large farmers, rather than small farmers, often able to take greater advantage of them. Reducing the cost of an input to the user also encourages greater, often less efficient, use of that input.

Subsistence farmers grow what they eat and eat what they grow, with little or no interaction with markets.

Supply chain: The continuum of activities and transactions that links supply with demand. In agriculture, supply chains are typically depicted as a chain of relationships starting with inputs and leading to consumption in domestic and foreign markets. The term is frequently used interchangeably with “value chain,” which refers to the value-added created by all actors along the supply chain.

