



# Modernization and Commercialization of Armenian Agriculture

*Synthesis*

*Priorities for Sector Reform and Investment*

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Expanding Horticulture Export in Armenia: The Context for Growth	Patrick Labaste, Ara Karapetyan, Heinz Strubenhoff, Arsen Nazaryan, Gagik Gabrielyan and Garry Christensen
Expanding Horticulture Export in Armenia: Lessons from Global Experience	Patrick Labaste
Strengthening Agricultural Extension: The Way Forward	David Lugg
Modernizing Food Safety in Armenia: Next Steps	Artavazd Hakobyan, Ara Karapetyan, Armen Poghosyan and Garry Christensen
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## Chapter 1

# Background and Scope of the Review

Armenia's strategy for the agriculture sector<sup>1</sup> aims to achieve both improved national food security and self-sufficiency and export led growth. Its key objectives are to: increase agricultural output, improve national food security, modernize and commercialize the sector, and rationalize farm and non-farm rural employment. While these objectives respond to the challenges the sector faces, they will not be easy to reconcile and achieve. For instance, the emphasis on increased self-sufficiency in wheat production in order to improve food security is at odds with the longer-term need to build a modern, commercialized agricultural sector producing and exporting according to comparative advantage. Armenia's comparative advantage lies with horticultural commodities, not with wheat. Similarly, the need to facilitate adjustments in farm and non-farm employment in rural areas is a challenge that all transition economies share, and which all are struggling to resolve.

A recent World Bank Group (WBG) review of this strategy concluded that while it provides an appropriate framework for sector development, there is an over-emphasis on realization of the shorter-term objectives to increase agricultural production and improve food security,<sup>2</sup> at the expense of longer-term measures to modernize the sector and facilitate adjustments in rural employment. This imbalance could compromise long-term sector development. The Government is also allocating a high and increasing proportion of its limited budgetary resources to raising production and improving food self-sufficiency, at the expense of longer-term requirements for sustainable development. While this focus reflects Armenia's pre-occupation with national food security, there is a risk that it will result in increased production from the current subsistence-oriented production base rather than a more deep-seated restructuring of farm ownership and management systems and the modernization and commercialization of agriculture.

Recognizing the need to increase support for realization of these longer-term sector objectives, the WBG agreed with the Government to prepare a wide-ranging review of the way forward for agricultural modernization and commercialization. Despite considerable recent work on the identification of value chains and the establishment of agricultural cooperatives—current action lacks a broad, long-term vision of how to proceed. The Government remains uncertain on how to bridge the gap between a future based on export-led growth and the current reality of small-scale, semi-subsistence farms and a small (albeit dynamic) agri-business sector. The objective of the review is to provide a framework for discussion with government on how to modernize and commercialize Armenian agriculture—a key objective of Armenia's current agriculture sector strategy. As some of the

proposals represent a significant departure from existing policy, the study is designed to frame and inform further discussion rather than serve as the “next steps” for action.

**The study focuses on themes and areas that have been identified as highly relevant for the modernization and commercialization of the agriculture sector.** The study originally aimed to review: agricultural marketing, processing and exports; food safety; agricultural “cooperation,” including farmers’ groups; agricultural extension and agricultural insurance. This coverage was subsequently modified to: (i) avoid repetition of existing work; (ii) draw more extensively on WBG experience in other countries; (iii) address relevant long-term issues more directly; and (iv) to inform discussion of relevant issues on which little information was available. The proposed review of marketing, processing and exports—an area that has already been well studied—was thus replaced with a review of global experience in developing successful export-led agricultural industries. Similarly, the study of agricultural “cooperation,” an area also widely studied, was replaced with an analysis of agricultural land markets. Both “cooperation” and land markets are highly pertinent to the need to increase farm size to improve competitiveness. Land markets offer a more structural, long-term response to this problem, however, a response that so far has received little attention. Finally, an analysis of public expenditure on agriculture was added to provide insight into public expenditure on long-term versus short-term sector objectives.

**The review outlines the elements of a long-term framework based on building a cluster-based, institutional framework for horticultural exports, and suggests the need to prioritize associated development of agricultural extension, food safety, agricultural land markets and agricultural risk management.** Horticulture is viewed as a vector for modernization and commercialization, due to its demonstrated potential for exports. The proposed framework would drive growth and change throughout the sector, however, due to the sector-wide impact of support for extension, food safety, land markets and risk management.

## Chapter 2

# Structure of the Review and Outputs

The review takes the form of stand-alone technical notes, which are pertinent to all aspects of agriculture. Wherever possible the technical notes present international experience in countries facing similar challenges, to further inform decisions on how to modernize and commercialize agriculture in general and horticulture in particular.

The technical notes are as follows:

- Expanding Horticulture Export in Armenia: The Context for Growth
- Expanding Horticulture Export in Armenia: Lessons from Global Experience
- Strengthening Agricultural Extension: The Way Forward
- Modernizing Food Safety in Armenia: Next Steps
- Agricultural Insurance: Experience in Middle Income Countries of Central and Southern Europe, and the CIS
- Strengthening Agricultural Land Markets
- Public Expenditure on Agriculture 2010–2014: Trends and Implications

The rest of this note provides a synthesis of the main conclusions and recommendations from the technical notes.

## Chapter 3

# The Context for Agricultural Modernization and Commercialization

**The basis for growth will need to change if Armenia's agriculture sector is to continue to enjoy the steady growth achieved since 2000.** The real value of agricultural output grew by 86% from 2000–2015,<sup>3</sup> an average of 5.4% per year, driven by increases in both prices and production. Real prices increased for many commodities, due to increasing demand on both domestic and export markets, except for food staples such as wheat, potatoes, milk, poultry and eggs. The medium-term outlook for continued price increases is weak, however, due to depressed conditions on traditional export markets and depressed demand and increased competition on domestic markets. Moreover, the production increases driving growth were achieved from a very low base, with crop and livestock productivity levels well below those in OECD countries with comparable agro-climatic conditions. Further, sustained increases in productivity will require a shift to more modern production systems—systems that are ill-suited to the small, semi-subsistence farms that dominate Armenian agriculture. Slower real sector growth rates since 2012 (annual average growth of 2.2% for 2012–2015) further suggest that the conditions underlying the price and production increases that drove previous growth no longer apply.

**Armenia's strategy for agriculture sector development assigns a high priority to the modernization and commercialization of agriculture.** Modern production, processing and marketing technologies are needed to strengthen its ability to compete on domestic and export markets; and a much higher proportion of output must be sold on these markets if the sector is to grow and capitalize on its demonstrated potential for export. Realization of this set of objectives is especially critical in Armenia's small, open economy; with its tiny domestic market and limited capacity for government support to agriculture. A modern, export oriented agricultural sector, built on existing comparative advantage, is the most realistic basis for future growth.

**Armenia agriculture has been faring well on export markets and there is potential for further sustained growth.** Exports of agricultural products (wine and beverages, tobacco products, aquaculture products, fruit and vegetables), continuing the steady growth of recent years, showed strong growth during 2003–2015 rising from US\$ 79.1 million to US\$398.0 million over the same period. Agri-export growth was especially strong from 2010–2013, when it doubled. There has been little growth since 2013, due to low agricultural production in 2014 and deteriorating conditions in the Russian economy in 2015. Agri-exports remain a major component of total exports, nevertheless, with 26% of total exports (US\$1.48 billion) in 2015. Current

trade and price policies have a limited impact on the competitiveness of Armenian exports due to Armenia's liberal economic environment, with its low levels of trade protection and minimal intervention in domestic markets. Armenia's decision to join the Eurasian Economic Union<sup>4</sup> (EEU), which became effective on January 1<sup>st</sup> 2015, may change this however. Like other members of the union, Armenia will adopt the EEU's common external tariffs after a transition period of 5–7 years. The immediate impact on trade is unlikely to be significant, as most existing trade is already with EEU members and bilateral trade agreements already exist with these countries. EEU membership will thus reinforce both the attractiveness of, and dependence on Russia for Armenia's agricultural exporters.

**Future sector growth will be much more reliant on increased productivity among farmers and agro-processors, and the ability to add value and compete on export markets.** The results of the competitiveness analysis that was carried out for grapes and apricots shows that they were competitively priced relative to Turkish exports throughout 2004–2014. The key result of this analysis is also that, while Armenian products have the ability to compete, their actual competitiveness can vary significantly from year to year. Hence, to remain competitive, producers and exporters must constantly seek ways to innovate, improve productivity and lower costs. Realization of future increases in productivity and exports will thus require a concerted effort to implement a key long-term theme of Armenia's agriculture sector strategy—the modernization and commercialization of agriculture. To meet this challenge Armenia will need to continue to grow its market and develop into a competitive export industry by turning its comparative advantage into competitive advantage. This will require policies that: improve the enabling environment for the private sector, streamline customs procedures, and align border transit procedures with the regulations of trading partner countries; as well as investment in transportation and market infrastructure (including food safety management systems). It is essential to continue to build on comparative advantage and, because of the serious constraints the country is facing, to create a competitive edge through investment in technology, and physical and human capital. The World Bank's support for this agenda includes a review of potential areas for reform and investment and an assessment of the priorities for action.

**This agenda would also include specific measures to correct gender inequalities in the agriculture sector.** In effect, rural residents employed in agriculture are often overrepresented among the poor in ECA generally and in Armenia in particular. Rural women are considered to be especially vulnerable because they are often not legal owners of land or agribusiness, and tend to be employed as lower-skill laborers. These measures could include for example, encouraging and/or setting quotas for women representation in decision making bodies, developing financing tools that prioritize women-headed agribusiness and communicating information about market or finance opportunities targeted at women (disseminate in places and through media channels that are more often frequented by women)

## Chapter 4

# Conclusions and Options for Sector Reform and Investment

The main conclusions and recommendations of the technical notes are summarized below, as the basis for discussion with government on the main options for reform and investment.

### 4.1 Export Horticulture

Armenia's dynamic, export oriented horticulture industry is a key driver of future agriculture sector growth—not only because of its inherent potential to increase production and exports, but also because of expected spill-over effects to other sub-sectors. The comparative advantage of Armenian horticultural exports is largely based on raw fruit and vegetables, however, as well as on higher-value commodities produced and exported with modern know-how and technology. Armenia's recent accession to the Eurasian Economic Union (EEU) has also reinforced its high dependence on Russian markets, the destination of 80% of horticultural exports. Competition is strong in these markets, particularly for processed commodities; and this competition will increase further in response to the entry of new competitors such as Iran, and the Russian government's recent commitment to boost output of fresh and processed agricultural products. Hence, in the long-term, the modernization of agriculture will also need to involve diversification into other markets.

An improved enabling environment for production (more efficient production and assembly, improved crop risk management) and export (food safety, customs procedures, border transit) and increased investment in physical infrastructure (storage, logistics) are clearly necessary for commercialization and modernization. But they are not sufficient. Even with the improved efficiencies generated by these investments, Armenian exports will still face significant structural constraints due to the country's landlocked location, limited transit routes and distance to major markets. Hence, the horticulture industry should not seek to compete on cost alone. The long-term objective should be to build an export industry which emphasizes quality, high value and product differentiation—obviating the need to compete on cost alone. This will require investment not only in technology and logistics, but also public-private partnerships, cluster development and the human capital needed to develop a knowledge based economy.

Drawing the experience of developing countries that have built a global presence in horticultural exports markets, the following areas of action are recommended:

- **Establish an industry cluster.** Work with the private sector and SMEs to build up a competitive industry cluster. Start by setting up a platform for permanent dialogue in a framework involving government-producers-investors/bankers.
- **Attract private investment, especially foreign direct investment (FDI),** by improving the investment climate and introducing adapted financial instruments. Use the experience of “anchor” investors to develop inclusive supply chain advisory and finance mechanisms, in cooperation with commercial banks. There are various models available and tested (aggregator/processor advisory for outgrowers, tri-partite finance mechanisms for inputs, and risk sharing mechanisms) to support competitive supply chains with finance and technology.
- **Deepen the knowledge on, and capacity of, the supply base.** Increase knowledge of the supply base, improve its response capacity and facilitate farmer linkages to processors/exporters and markets. Investing in successful food value chains means attracting anchor investors that are able and willing to integrate primary production, aggregation/processing and marketing/exports.
- **Invest in market research and market intelligence, and promote the origin of Armenia.** This can be achieved through assistance to find new markets, assess market opportunities and implement market development strategies. Prioritize high value differentiated products, including branding and promotion of the origin through participation in international fair shows and international exhibitions. Commission market research to help private operators target markets and products more effectively and establish the Armenia origin with a strong portfolio of products and technologies.
- **Improve infrastructure and logistics.** Intermediate links for aggregating, processing and adding value to primary products are underdeveloped. These links could be improved by supporting PPPs to invest in marketing infrastructure such as consolidation centers for fruit and vegetables and a consolidation platform for processed foods. Such centers will allow producers to enter into contracts with buyers for larger batches, optimize logistics costs and create a consolidation platform for dried fruit.
- **Enhance competition.** Monopsonistic business models are not a substitute for industry cluster development. Hence, it is important to ensure effective competition in parallel to the development of market infrastructure. Given the logistical issues related to the transport and transit of Armenian exports, it is also critical to ensure highly efficient import and export procedures to improve both the cost and quality competitiveness of export products. Current inefficiencies in import and export procedures reduce Armenia’s investment attractiveness and lower the competitiveness of final products.
- **Ensure progressive compliance with international food safety standards, to enhance the capacity for market diversification.** This recommendation is justified and developed in more detail under the specific section on food safety issues (see 4.3 below).

- **Improve access to adapted finance and insurance mechanisms.** Encourage the creation by banks of new, long-term financial products for greenhouse and fruits and vegetables (F&V) processing companies. Anchor investors experience could also be used to develop inclusive supply chain advisory and finance mechanisms in cooperation with commercial banks.

**Support for these recommendations would mean a significant broadening of government’s current aim to support private investment in intensive (green house) horticulture, towards building a competitive cluster of all horticultural products.** This objective is perhaps more ambitious and more long-term—to build the knowledge and capacity for broad-based modernization and commercialization of the horticulture industry. It will require considerable upstream investment to strengthen the supply base, build public-private partnerships and develop industry-wide platforms for cooperation between the Government and the private sector.

## 4.2 Agricultural Extension

**Armenia’s public agricultural extension system is in good shape, better than most countries at a similar stage, and requires progressive reform and development rather than a completely new approach.** Its strengths are that: work plans are based on farmers’ needs, it has good acceptance by farmers, covers most communities in Armenia, and outputs and results are good. It also generates around 20% of its total costs from the sale of services and consultancies, with the rest from state funding. This dependence on budget support means that any decision to cut funding would limit operations, and likely result in a significant decline in the quality and quantity of services. Current budget support is very modest, however, in both relative and absolute terms. The allocation of 346 million AMD (627,000 euros) in 2014 for delivery of extension services was only 2.5% of the MoA budget. A doubling of budget support could thus make a big difference to service quality and have a major impact on sector output, without diverting significant resources from other budget programs. World Bank studies suggest that investment in farm advisory services and applied research can yield high economic rates of return, boosting output more than other public spending on agriculture such as subsidies. These studies indicated that returns on research and development investment average 43% a year, with high returns in all regions of the world. The level of return depends on the extent to which investments meet the needs of the small farmers and the rural sector, and on the quality of spending.

**Based on these considerations, the key recommendations are to strengthen public extension as the best means to reach Armenia’s small-scale farms, and to focus on measures to improve the quality of service delivery.** The main role of public extension is to provide public good services that the market will not supply, including support to small farmers who are

not in a position to pay for advice, together with a range of activities such as field trials, demonstrations and mass media messages that are crucial for agricultural development but difficult to charge for. Service quality can be improved through increased budget support for advisor salaries and transport, continued on-the job training, and wider use of modern information technologies. There is also scope to moderately improve cost-effectiveness and cost-recovery, although a target of 30% cost-recovery is considered optimal. Both outreach and service quality are likely to fall significantly if higher levels of cost-recovery are sought.

**The emphasis on public extension does not preclude a multi-faceted approach to extension that includes other approaches to service delivery.** The MoA should continue to work with a range of service providers, including the MASCs/RASC, local NGOs and private sector suppliers such as CARD Agro-Service—depending on their comparative strengths and areas of specialization. The Farm and Veterinary Service Centers model adopted by CARD holds promise in this regard, although its impact and cost-effectiveness should be carefully evaluated. FSCs and VSCs also require considerable public (donor) support and may be better suited to provide inputs for larger farmers in areas with more intensive production, with advisory services ultimately playing a lesser role. Small farmers and livestock producers in more remote areas, who may have less access to inputs and advice, may be better served by the public extension service. Accordingly, it is suggested that the impact of the FSCs and VSCs are surveyed to assess the number and type of farmers that use their services, the amount and type of sales generated, the profitability of the centers, and how the services are rated by farmers. If the surveys show that they are potentially sustainable, consideration could be given to relocating the MASC premises to more visible locations and to introducing a wider array of services.

### 4.3 Food Safety

After a concerted effort to align its food safety legislation with European Union standards from 2009–2013, Armenia has recently re-aligned this legislation with that of Russia and other CIS countries—to comply with its membership of the EEU. This shift has contributed to a lack of clarity in the interpretation and implementation of current food safety law. A weak capacity for certification, low awareness of the benefits and costs of modern food safety, limited enforcement of safety standards and poor training pose further problems, resulting in a low rate of industry certification (40–45 certificates of compliance issued in the last 7 years). Recommended responses to these issues are outlined below. All of these measures require active leadership by the State Food Safety Service (SFSS)—the principal agency for food safety.

- **Strengthen the operationalization of food safety laws and regulations.** The basis for operationalizing Armenia’s modernized food safety laws and regulations lacks clarity. The approach to implementation of Hazard

Analysis Critical Control Points (HACCP) procedures is unclear, discouraging investment by industry. Limited levels of inspection and enforcement by SFSS further reduce the incentive for industry to invest in modern food safety practices, especially for smaller enterprises producing for the domestic market. A more pro-active role by the SFSS would help to address these constraints, including measures to improve the clarity of current laws and regulations, an information campaign to publicize these changes, and stronger inspection and enforcement capacity. There is also scope to introduce greater flexibility in the requirements for compliance, allowing for lower levels of investment and less expensive risk management procedures for smaller enterprises—as in the European Union.

- **Strengthen the quality of national consulting and accreditation.** The low quality of many national consulting service is slowing the adoption of modern food safety systems. The accreditation provided by the National Institute for Standards (NIS) also appears to lack adequate international recognition. The investments being made by the food industry are thus yielding poor returns, reducing the incentives for industry to modernize their food safety systems. The SFSS should lead the response to this set of issues, beginning with measures to strengthen the capacity of Armenian private consulting services. It should also commission an external evaluation of the accreditation by NIS and address the issues that hamper international recognition of their activities.
- **Broaden and accelerate access to international accreditation.** Improved access to international accreditation services and the international accreditation of national laboratories is necessary. Internationally recognized services facilitate access to a wider range of international markets for the more progressive elements of the food industry and set a benchmark for service provision by national agencies and consulting enterprises. Investment in equipment and training is also required to facilitate the international accreditation of national laboratories. Broad-based measures to motivate and enforce industry compliance with food safety laws and regulations will help to increase the current low level of demand for international accreditation services.
- **Increase industry awareness of the costs and obligations of modern food safety.** Industry understanding of the costs and benefits of modern food safety systems is poor. On the cost side, food manufacturers often view investment in facilities and equipment as the basis for compliance, rather than the need to focus on improved risk management. And they are often unaware that the costs of compliance include payment for advisory services and accreditation. More effort is also needed to improve industry recognition that the adoption of modern food safety systems is an obligation, not a choice. Industry's focus should be on how and when to comply, and how to make these changes cost-effectively, not on how to avoid or delay compliance. An SFSS-led public information campaign would help to address this information gap. Industry leaders who have achieved compliance should be involved, along with reputable advisory and accreditation services.

- **Establish a vocational or university diploma program for food safety training.** To date, most of the training for food safety has relied on *ad hoc* donor programs implemented in association with the adoption of EU legal and institutional reform—which have now ended. A new generation of food industry enterprises is thus emerging, without access to training, who need an understanding of the requirements for compliance under a very different (EEU) food safety system. Food safety inspectors, laboratory technicians and advisory and accreditation services also need a comprehensive understanding of EEU and international food safety systems. In the future, this training should be accessible on a permanent basis, rather than through reliance on *ad hoc* donor support. A vocational or university based diploma program is thus needed to provide both the public and private elements of the food industry with trained people. There may also be an opportunity to develop such a program on a regional basis, in order to make it more cost-effective.

#### 4.4 Agricultural Land Markets

Agricultural land markets are weak in Armenia, although recent evidence shows that they are expanding. Approximately 10,000 ha was sold in 2015, equivalent to 0.5% of total agricultural land. A further 270,000 ha was leased out by municipalities. There are no data on private land leasing although it is likely to be much higher than municipality leasing. A range of measures can be used to strengthen agricultural land markets, as outlined below.

- **Implement a land consolidation program.** A nationwide land consolidation program is needed to improve the efficiency of land use and facilitate land market development. Government should designate an authorized institution to lead this program, and ensure an adequate legal framework for program implementation.
- **Improve cadastral data.** Inaccuracies in the cadaster result in overlaps that inhibit land sales. A systematic registration of state and municipal land, forest and land under water should be conducted in order to resolve the overlaps with new surveys. As cadastral maps differ from the reality on the ground, government should consider initiating mass assessment of the existing cadastral maps and implement a systematic re-surveying of land parcels/update digital cadastral maps or modify existing maps.
- **Develop a more efficient land monitoring system.** Government should consider the introduction of an integrated, analytical information system to monitor land use such as a Land Parcel Identification System (LPIS) or Farmers Registry.
- **Improve the efficiency of municipal land lease and alienation.** In order to facilitate a more efficient and effective alienation of municipal and state land, Government should conduct a systematic re-valuation of state land and update the cadastral valuation maps. This will help regulate the alienation process, generate more revenues for the municipalities where land

is being sold below market price, and increase sales where alienation is constrained by high prices. At the same time, there is a need to develop guidelines and conduct training for municipalities to increase their capacity for land use planning, land alienation and land lease. Local governments should also ensure wider access to information on land alienation through media and awareness programs.

- **Strengthen policies for abandoned land.** All abandoned land should first be identified. There will be cases where abandoned land is registered and the owner is known, and cases where the land owner is not known and not registered. The issue of absentee landowners will also play an important role, as some original owners may be deceased or have passed their land to others. Policies should be socially acceptable and supported by relevant legislation.
- **Improve demarcation of State and Municipal land.** Inadequate demarcation has resulted in sale/lease of the same plot by neighboring municipalities. This issue should be addressed by local government, particularly where municipalities are to be consolidated or enlarged.
- **Support the development of real estate agencies in rural areas.** Real estate agencies are well developed in urban areas of Armenia, providing area and price information and photos of properties on their websites. Equivalent information on agricultural land is extremely limited or absent. Instead, it is scattered among municipalities and communities, which constrains agricultural land market development and farm enlargement. Support for the development of real estate agencies in rural areas will help to address this constraint, and strengthen the institutional base for rural land.
- **Implement a Land Governance Assessment Framework (LGAF).** A Land Governance Assessment Framework (LGAF)<sup>5</sup> is recommended to assess the status of land governance. The LGAF is a tool designed by the World Bank to help countries assess their policies and practices for land governance and to provide benchmarks for comparison and monitoring of progress. It has been implemented in over 40 countries including Moldova, Georgia, Ukraine and Croatia.

## 4.5 Agricultural Insurance and Risk Management

Producers of many of the high value fruit and vegetable crops that provide the base for agricultural exports are highly vulnerable to climate risks, which destabilize their incomes and reduce the incentives to invest in modern technology. The Armenian Government is planning to establish an agricultural insurance program as a means to mitigate production risks. A proposal on how to proceed with agricultural insurance has been commissioned by the Central Bank of Armenia (CBA) as the first step towards this objective. To help inform government consideration of this proposal, the study reviewed agricultural insurance programs in the following countries in the ECA region: Albania, Belarus, Bosnia and Herzegovina, Georgia, Moldova, Serbia,

Macedonia, Montenegro, Russia and Ukraine. The technical note also discusses program costs and implementation arrangements of insurance programs in the EU countries, US and Canada as a means of providing further guidance to the Government of Armenia. It should be noted, however, that the international experience shows that insurance is not a panacea for production shocks. Coverage is unlikely to exceed 10% of the value of agricultural output in the initial years, and unlikely to exceed 50% of the value of output in later years—even with strong support and high levels of government subsidization. Other forms of risk management should thus be actively supported in addition to insurance, particularly *ex ante* crop and livestock management techniques that mitigate risk (e.g. hail nets, frost guns, irrigation, livestock feed reserves, livestock vaccination programs). By reducing underlying production variability, these risk mitigation strategies also improve the ability to ensure supply on export markets and reduce the loss of export earnings. Insurance only compensates producers for loss of income.

Multiple and named peril insurance (MPCI and NMPI) are the most commonly observed forms of agricultural insurance in these countries. Area-yield index insurance is being piloted in Albania, Serbia and Macedonia. It was also tested in Ukraine but farmers preferred MPCI products because of their more comprehensive coverage. There is no positive experience with weather-index insurance in the region so far. Private insurers provide agricultural insurance products in most cases, with government subsidizing 50% of the premiums. A few countries set a cap on the maximum premium subsidy per farm. Insurance coverage averages 5% to 7% of crop area or total number of farmers for crops. Livestock insurance programs have even lower penetration ratios.

This low level of coverage is attributed to: inadequate use of sustained information and awareness campaigns for farmers, the co-existence of *ad hoc* emergency relief programs and insurance for farmers, corruption, and a weak capacity to underwrite agricultural risks. Access to re-insurance is also a problem in some countries, especially where the agricultural insurance portfolio is very small. The lack of an effective dispute resolution mechanism was also found to be a constraint to higher use of agricultural insurance.

Experience in these countries shows that the key prerequisite for successful program introduction is a pro-active government. A public-private partnership is probably the best platform for the establishment of agricultural insurance in Armenia, but it will need strong leadership from the Government and pro-active participation by all partners, including farmers. A sustained (2–3 year) program of information and education will be essential to build farmer understanding and the Government must work actively to build farmer trust. The current program of *ad hoc* disaster relief payments to farmers will need to be terminated or modified, to ensure that farmers don't have access to both insurance and disaster relief. In addition to program leadership the Government should also take responsibility for the enactment of necessary legislation, the provision of adequate statistics and the establishment of an effective mechanism for dispute resolution. Both the Government and insurers should also make provision for mistakes and losses during the initial years, as program development will inevitably be a learning process.

The agricultural insurance review departs from the CBA study's recommendations in that it views MCPI and NMPI products as most suited to Armenia. It also recommends further consideration of group-based area-yield insurance. Weather index insurance is not viewed as a viable option for Armenia at this time. The CBA study recommendation to link insurance to credit programs is also queried. Experience elsewhere shows that financial institutions do not view insurance as a legitimate form of collateral and so don't reduce lending rates for farmers who take out insurance with a loan.<sup>6</sup> The use of financial institutions to facilitate insurance distribution and sales has not been a demonstrable success, and calculation of the insured yield for credit linked insurance is problematic.

The other main pre-conditions include:

- **Establish an appropriate legal framework.** This is critical but often difficult, and may require a strong will from the Government. In the CIS countries this critical requirement was often obstructed by old-style bureaucracy.
- **Ensure the provision of adequate statistical information.** Ideally, statistical data should be available for 20+ years on each crop type and for each administrative unit (rayon, county, taluk, etc.). Historical yield data at farm level is also desirable. Further historical data on weather and risk events is required to calculate premium rates for MPCI and named-peril programs. It is possible to use proxy crop rates and expert judgement where statistical data is not available, but this is less reliable and such rates should be applied with caution.
- **Build capacity to develop agricultural insurance.** Many of the countries reviewed have no insurance companies with strong experience in agricultural insurance. In others the insurance sector is small and private insurance companies have limited capacity to underwrite agricultural risks. Government should lead support to private insurers in this situation, and ensure that they have the time and resources to acquire the capacity to deal with agricultural risk. Alternatively, the insurance companies themselves may create a single agricultural insurance company to deal with agricultural risks (Hagelversicherung in Austria). Where the insurance sector shows no interest in agriculture, government can either establish a state-owned specialized insurance company (Crown Corporation in Canada), an insurance and catastrophic fund (KANAT in Israel) or support the establishment of an insurance pool (Agroseguro in Spain, TARSIM in Turkey). Strong regulation of all insurers is also advised to avoid subsidy abuse and preserve client trust.
- **Secure adequate underwriting and loss adjustment capacity and access to actuarial services.** These are more tractable problems, which can be overcome in a shorter period of time. Underwriting and loss adjustment knowledge can be obtained through re-insurers or via direct contacts with insurers in other countries. Experience shows that with moderate costs any country can obtain the necessary volume of professional knowledge and skills within 2–3 years. Basic rate calculation methodologies are

publicly available, and more sophisticated methodologies can be obtained at reasonable cost. Some fine-tuning may be required but this can be done by outsourcing actuarial services from other countries.

- **Facilitate access to re-insurance.** The key obstacle to quality re-insurance is the small volume of the premium portfolio and the low level of technical knowledge within the insurance companies. Major reinsurers are not usually interested in reinsurance programs with less than 500 thousand dollars/euros premium per year. However, these reinsurers may lower their qualification requirements if the client/country can prove that there is potential for program growth in the future.

If these conditions are met, insurance coverage could potentially reach 10% of crop area within 2–3 years of program initiation and 20–30% within 3–4 years. A penetration rate of up to 50% could be achieved within 10 years. A realistic time-frame of 7–10 years is also essential for the establishment of an agricultural insurance program, including a pilot program of 3–5 years. This potential upper limit to insurance coverage also shows that insurance is not a panacea for agricultural risk management. Even under the most optimistic scenario, at least half of crop production will not be covered by insurance. Hence, the Government will also need to support alternative forms of risk management—including farm level *ex ante* responses to hail, frost and drought (e.g. hail nets, frost guns, irrigation). These *ex ante* risk management strategies also provide protection against loss of production, the destabilization of domestic markets and the loss of export earnings—in contrast to insurance which only covers loss of income.

## 4.6 Public Expenditure

**Aggregate public expenditure in the agriculture sector<sup>7</sup> has increased in real terms since 2011, although it remains modest at 4.5% of total public expenditure in 2014. An increase in current expenditure has driven this growth, due largely to increased direct budget support (mostly subsidies) for agriculture.** In contrast, recurrent expenditure on essential public services has increased little—despite a 26% increase in the real value of agricultural GDP. This emphasis on direct budget support at the expense of essential public services is a concern. A strong public sector capacity for agricultural extension, food safety, border control and the management of crop and livestock diseases are critical for sector modernization and commercialization. Public investment has also fallen since 2010, although most capital expenditure is still directed to irrigation, water supply and drainage projects. Only 1% of investment expenditure is currently allocated to measures to strengthen the provision of public services for agriculture.

**There are strong grounds and adequate scope to re-balance both current and capital expenditure, in order to provide stronger support for the modernization and commercialization of agriculture.** Continued expenditure on fuel subsidies, a major current subsidy program, is questionable given its

disproportionate support for larger farmers and potential for abuse. Other subsidy programs such as that for livestock breeding stock lack the size and continuity to be effective. Future budget support for farmers should focus on a narrower set of measures to support private investment and input supply; and should be capped to preclude a disproportionate allocation of public funds to larger farmers. This narrower focus would facilitate a re-allocation of current expenditure to support for essential public services. Both donors and government should also increase public investment on measures to strengthen public and private institutions and to build the knowledge and skills required for modern production, processing and marketing systems.

Most of these are all budget neutral recommendations, which are consistent with the national strategy documents. Farm input subsidies improve access to scale neutral inputs, which benefit large and small farmers alike; and a cap on these subsidies would limit the transfer of disproportionate benefits to larger farmers. Increased support for essential public services would also benefit small-farmers, particularly measures to strengthen the public agricultural extension system, as would stronger donor investment in public and private institutions and human capital.

# Chapter 5

## Summary Matrix

The matrix below provides a synoptic view of the findings of the review and options for policy and investment.

Objective	Proposed Policy Measures	Time Horizon and Priority Level	Knowledge Gaps
<b>I. Export Horticulture</b>			
<b>Facilitate the formation of an industry cluster</b>	With the private sector and SMEs, build up a competitive industry cluster; start by setting up a platform for a permanent dialogue within a government-producers-investors/bankers framework.	<b>Long term, progressive, high</b>	Global experience on cluster development, country study visits
<b>Attract private investment, especially FDI</b>	Improve the investment climate and put in place adapted financial instruments. Anchor investors' experience could be used to develop inclusive supply chain advisory and finance mechanisms in close cooperation with commercial banks. There are various models available and tested (aggregator/processor advisory for outgrowers, tri-partite finance mechanisms for inputs, risk sharing mechanisms) to support competitive supply chains with needed finance and technology. This should proceed in parallel with an improved policy and institutional framework.	Short-term, high	Feasibility study of adapted financing mechanisms
<b>Deepen the knowledge on, and capacity of, the supply base</b>	Acquiring a better knowledge of the supply base, improving its response capacity and facilitating farmer linkages to processors/exporters and markets. Investing in successful food value chains means attracting anchor investors that are able and willing to integrate primary production, aggregation/processing and marketing/exports. Achieving this will entail: (i) improving the knowledge and mapping of the horticulture agro-ecological potential in the country, and (ii) developing institutional linkages (research, R&D, financial institutions).	Short to medium term, high	Updated and deep knowledge on agro-ecological aptitudes by region/zone, agrarian structures, yields and productivity of horticulture crops
<b>Invest in market research and market intelligence, and promotion of the origin of Armenia</b>	This can be done by offering assistance in finding new markets, helping assess market opportunities and implementing market development strategies. Prioritize high value differentiated products, including branding and promotion of the origin through participation in international fair shows and international exhibitions like ProdExpo in Moscow, as well as organizing study tours. Commission specific market research and market studies to help private operators target markets and products more effectively and establish the Armenia origin comprising a strong portfolio of products and technologies.	Long-term, moderate	Market research, benchmarking and competitiveness analysis

Objective	Proposed Policy Measures	Time Horizon and Priority Level	Knowledge Gaps
<b>Improve infrastructure and logistics</b>	Intermediate links for aggregating, processing and adding value to primary products are underdeveloped. This could be improved by supporting PPPs to invest in marketing infrastructure like collection centers—for example, consolidation centers for fruit and vegetables—and a consolidation platform for the processed foods, in order to be able to enter into contracts with buyers for larger batches and optimize logistics costs and creating a consolidation platform for dried fruit. Keep an eye on possible road and railway network development projects at regional level (Trans Caucasian corridor linking Russia and Iran).	MLT, high	Analysis of existing infrastructure and performance
<b>Enhance competition</b>	Monopsonistic business models are not a substitute for industry cluster development. On the contrary, it is important to ensure effective competition in the market, in parallel to the development of market infrastructure. Given the logistical issues related to Armenia being landlocked, it will be critical for Armenia to ensure highly competitive import and export procedures to ensure both cost and quality competitiveness of the final produce to be exported. Currently, inefficiencies in import and export procedures negatively affect the country's investment attractiveness and considerably lower the competitiveness of final products.	MLT, high	Supply chain mapping and analysis
<b>Ensure progressive compliance with international food safety standards</b>	Assistance in the implementation of new safety procedures for processes and products is needed, and certification of compliance with standards at the cannery level is a necessary condition for market diversification. The objective is to build the capacity to comply with food safety standards.	Long-term, high	Disseminate knowledge on food safety compliance standards
<b>Improve access to adapted finance and insurance mechanisms</b>	This would entail encouraging the creation by banks of new, long-term products for greenhouse and F&V processing companies. Anchor investors experience may also be brought to bear to develop inclusive supply chain advisory and finance mechanisms in close cooperation with commercial banks.	Short-term, high	Feasibility studies of new financing and guarantee mechanisms
<b>II. Agricultural Extension</b>			
<b>Improve the delivery of extension services</b>	Improving extension requires progressive reform and development rather than a completely new approach. Its strengths are that: work plans are based on farmers' needs, it has good acceptance by farmers, covers most communities in Armenia, and outputs and results are good. Service quality can be improved through increased budget support for advisor salaries and transport, continued on-the-job training, and wider use of modern information technologies.	MLT, high	Lack of baseline survey data

Objective	Proposed Policy Measures	Time Horizon and Priority Level	Knowledge Gaps
<b>Increase budget allocation to extension</b>	Current budget support is very modest, in both relative and absolute terms. An increase in budget support from the current level could thus make a big difference to service quality and have a major impact on sector output, without diverting significant resources from other budget programs. Service quality can be improved through increased budget support for advisor salaries and transport, continued on-the job training, and wider use of modern information technologies.	Short-term, high	
<b>Improve cost-effectiveness and cost-recovery</b>	There is scope to moderately improve cost-effectiveness and cost-recovery, although a target of 30% cost-recovery is considered optimal—currently it stands at around 20%. Both outreach and service quality are likely to fall significantly if higher levels of cost-recovery are sought.	Medium term, moderate	
<b>Promote a multi-faceted, pluralistic approach to extension service provision</b>	A multi-faceted approach, which includes other approaches to service delivery. The MoA should continue to work with a range of service providers, including the MASCs/RASC, local NGOs, and private sector suppliers such as CARD Agro-Service—depending on their comparative strengths and areas of specialization.	Short-term, high	
<b>Monitor the impact of the FSCs and VSCs</b>	The impact of the FSCs and VSCs are surveyed to assess the number and type of farmers that use their services, the amount and type of sales generated, the profitability of the centers, and how the services are rated by farmers. If the surveys show that they are potentially sustainable, consideration could be given to relocating the MASC premises to more visible locations and to introducing a wider array of services.	Short-term, high (especially improved food security for poor)	
<b>III. Food Safety</b>			
<b>Strengthening the operationalization of food safety laws and regulations</b>	The SFSS should seek to improve the clarity of current legislation and its implementation, conduct an information campaign about the existing legislation and incoming changes, consider additional flexibility in food safety application, as well as alternatives, for smaller agro-processors, and finally secure stronger inspection and enforcement capacity	MLT, high	Identification of affordable alternative procedures for food safety compliance for smaller agro-processors
<b>Strengthen the quality of national consulting and accreditation</b>	The SFSS should lead the response to this set of issues, beginning with measures to strengthen the capacity of Armenian private consulting services. It should also commission an external evaluation of the accreditation by NIS and address the issues that hamper international recognition of their activities.	Long-term, moderate	External evaluation of NIS accreditation performance

Objective	Proposed Policy Measures	Time Horizon and Priority Level	Knowledge Gaps
<b>Broaden and accelerate access to international accreditation</b>	Improved access to international accreditation services and the international accreditation of national laboratories is necessary. Internationally recognized services facilitate access to a wider range of international markets for the more progressive elements of the food industry and set a benchmark for service provision by national agencies and consulting enterprises. Investment in equipment and training is also required to facilitate the international accreditation of national laboratories. Broad-based measures to enforce industry compliance with food safety laws and regulations will help to increase the current low level of demand for international accreditation services.	Long-term, moderate	
<b>Increase industry awareness of the costs and obligations of modern food safety</b>	Industry understanding of the costs and benefits of modern food safety systems is poor. More effort is also needed to improve industry recognition that the adoption of modern food safety systems is an obligation, not an option. Industry's focus should be on how and when to comply, and how to make these changes cost-effectively, not on how to avoid or delay compliance. An SFSS-led public information campaign would help to address this information gap. Industry leaders who have achieved compliance should be involved, along with reputable advisory and accreditation services.	Short-term, high	
<b>Establish a vocational or university diploma program for food safety</b>	In order to continuously ensure that a sufficient number of educated and skilled food safety specialists are available, dedicated educational programs need to be established, either at vocational or university level; a regional solution might be considered, since the demand for trained specialists with an understanding of EU and EEU food safety systems extends beyond Armenia.	MLT, high	Assessment of training needs
<b>IV. Agricultural Land Markets</b>			
<b>Implement a land consolidation program</b>	A nationwide land consolidation program is needed to improve the efficiency of land use and facilitate land market development. Government should designate an authorized institution to lead this program, and ensure an adequate legal framework for program implementation.	Long term, high	
<b>Improve cadastral data</b>	Conduct a systematic registration of state and municipal land, forest and land under water in order to resolve the overlaps with new surveys. A systematic registration of state and municipal land, forest and land under water should be conducted in order to resolve the overlaps with new surveys. As cadastral maps differ from the reality on the ground, government should consider initiating mass assessment of the existing cadastral maps and implement a systematic re-surveying of land parcels/update digital cadastral maps or modify existing maps.	High	Assessment of existing cadastral maps and systematic re-surveying of land parcels in order to update digital cadastral maps

Objective	Proposed Policy Measures	Time Horizon and Priority Level	Knowledge Gaps
<b>Develop a more efficient land monitoring system</b>	Government should consider the introduction of an integrated, analytical information system to monitor land use such as a Land Parcel Identification System (LPIS) or Farmers Registry.	MLT, high	
<b>Improve the efficiency of municipal land lease and alienation</b>	In order to facilitate more efficient and effective alienation of municipal and state land, government should conduct a systematic valuation of state land and update the Cadastral Valuation maps. This will help regulate the alienation process, generate more revenues for the municipalities where land is being sold below market price, and increase sales where alienation is constrained by high prices. At the same time there is a need to develop guidelines and conduct training for municipalities to increase their capacity for land use planning, land alienation and land lease. Local government should also ensure wider access to information on land alienation through media and awareness programs.	Medium term, high	Assessment of state land value and update of cadastral valuation maps
<b>Strengthen policies for abandoned land</b>	All abandoned land should first be identified. There will be cases where abandoned land is registered and the owner is known, and cases where the land owner is not known and not registered. The issue of absentee landowners will also play an important role, as some original owners may be deceased or have passed their land to others. Policies should be socially acceptable and supported by relevant legislation.	Medium term, moderate	Identification of abandoned land
<b>Improve demarcation of State and Municipal land</b>	Inadequate demarcation has resulted in sale/lease of the same plot by neighboring municipalities. This issue should be addressed by local government, particularly where municipalities are to be consolidated or enlarged.	Medium term, moderate	
<b>Support the development of real estate agencies in rural areas</b>	Real estate agencies are well developed in urban areas of Armenia, providing area and price information and photos of properties on their websites. Equivalent information on agricultural land is extremely limited or absent. Instead, it is scattered among municipalities and communities, which constrains agricultural land market development and farm enlargement. Support for the development of real estate agencies in rural areas will help to address this constraint.	Medium term	
<b>Implement a Land Governance Assessment Framework (LGAF)</b>	A Land Governance Assessment Framework (LGAF) <sup>1</sup> is recommended to assess the status of land governance. The LGAF is a tool designed by the World Bank to help countries assess their policies and practices for land governance and to provide benchmarks for comparison and monitoring of progress. It has been implemented in over 40 countries including Moldova, Georgia, Ukraine and Croatia.	Medium term, high	Absence of a Land Governance Assessment Framework

Objective	Proposed Policy Measures	Time Horizon and Priority Level	Knowledge Gaps
<b>V. Agricultural Insurance and Risk Management</b>			
<b>Establish an appropriate legal framework</b>	Critical but often difficult, and requires a strong will from the Government. In the CIS countries this critical requirement was often obstructed by old-style bureaucracy.	MLT, high	
<b>Ensure the provision of adequate statistical information</b>	Statistical data should be available for 20+ years on each crop type and for each administrative unit (raion, county, taluk, etc.). Historical yield data at farm level is also desirable. Further historical data on weather and risk events is required to calculate premium rates for MPCl and named-peril programs. It is possible to use proxy crop rates and expert judgement where statistical data is not available, but this is less reliable and such rates should be applied with caution.	Medium term, high	Lack of statistical data and time series for each crop type and for each administrative unit
<b>Build capacity to develop agricultural insurance</b>	Many of the countries reviewed have no insurance companies with strong experience in agricultural insurance. In others the insurance sector is small and private insurance companies have limited capacity to underwrite agricultural risks. Government should lead the support to private insurers in this situation, and ensure that they have the time and resources to acquire the capacity to deal with agricultural risk. Strong regulation of all insurers is also advised to avoid subsidy abuse and preserve client trust.	MLT, high	
<b>Secure adequate underwriting and loss adjustment capacity and access to actuarial services</b>	Underwriting and loss adjustment knowledge can be obtained through re-insurers or via direct contacts with insurers in other countries. Experience shows that with moderate costs any country can obtain the necessary volume of professional knowledge and skills within 2-3 years. Basic rate calculation methodologies are publicly available, and more sophisticated methodologies can be obtained at reasonable cost. Some fine-tuning may be required but this can be done by outsourcing actuarial services from other countries.	Medium term, moderate	
<b>Facilitate access to re-insurance</b>	The key obstacle to quality re-insurance is the small volume of the premium portfolio and the low level of technical knowledge within the insurance companies. Major reinsurers are not usually interested in reinsurance programs with less than 500 thousand dollars/euros premium per year. However, these reinsurers may lower their qualification requirements if the client/country can prove that there is potential for program growth in the future.	MLT, moderate	

Objective	Proposed Policy Measures	Time Horizon and Priority Level	Knowledge Gaps
<b>VI. Public Expenditure</b>			
<b>Concentrate public expenditure on large programs</b>	Public expenditure may be more effectively used in fewer, larger and more sustained programs of budget support, and/or re-allocated to strengthen the delivery of essential public services. The growing current expenditure allocation to direct budget support for agriculture has been characterized by the evolution of numerous, small, erratically financed subsidy and grant programs—particularly in the MoA. The impact of some of these programs is questionable. Their small size and lack of continuity precludes the transfer of a critical mass of financial resources, and is unlikely to encourage private investment in related activities.	Medium term, high	
<b>Revise the balance in public expenditure toward the provision of extension services</b>	Strive for a much better balance between investment in public and private sector institutions and human capital, versus investment in physical infrastructure. Capital expenditure is still dominated by investment in irrigation, water supply and drainage projects, which accounted for 91% of public investment in agriculture in 2014; followed by investment in environmental protection (8%). Only 1% of investment expenditure is currently allocated to support for agricultural services. This is a worrying trend given the need to build a knowledge-based economy with the capacity to modernize and commercialize agriculture and to build a sector driven by agricultural exports.	Medium term, high	
<b>Increase budget allocation to provision of public services</b>	An increased budget allocation to critical public services is warranted, particularly for services such as extension that contribute substantially to the development of a knowledge economy; and for crop protection, which improves producer capacity to mitigate the risks and volatility of crop production. Very little of the sharp increase in real current expenditure has been allocated to improve the provision of essential public services, despite continued sector growth, as evidenced by a 26% increase in the real value of agricultural GDP from 2010 to 2014. A growing sector needs a growing capacity to provide the public services that assure it functions well. Only food safety and animal health have received increased budget allocations, while expenditure on all other public services has either fallen or been held constant in real terms.	Medium term, high	

# Notes

1. Sustainable Agricultural and Rural Development Strategy 2010–2020, currently being updated for 2015–2025.
2. Short-Term Objectives and Long-Term Outcomes: Agricultural Sector Development in Armenia. August 2015.
3. National Statistical Agency of Armenia.
4. The EEU comprises Russia, Armenia, Belarus, Kazakhstan and Kyrgyzstan.
5. <http://econ.worldbank.org/lgaf>
6. While insurance is not viewed as collateral it could be perceived as is a confidence building risk management strategy to boost confidence in lending. For example, in the past Credit Agricole have reduces the interest rate on loans for farmers with good insurance policies in Ukraine.
7. Combined expenditure by the Ministry of Agriculture and the State Committee for Water Management.

