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**Value chain development and post-harvest loss reduction for smallholder
farmers**

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I. Introduction

1. The Asia-Pacific region must double its food production in order to feed an additional one billion people by the year 2050. Presently, within traditional supply chains for mass markets across the region, quantitative post-harvest losses average from 10 to 15 percent for grains and from 15 to 50 percent for perishable horticultural crops. These losses result largely from a weak infrastructural support base and a lack of technical knowledge and organizational capacities among smallholder farmers who increasingly face marginalization.
2. Apart from reducing the quality, quantity and value of food, losses result in wasting resources, reducing returns to smallholder farmers, contributing to increased prices for consumers and adding pressure to an already strained natural resource base as farmers try to compensate by increasing their production, often with inadequate agricultural tools and inputs. Modern supply chain approaches, such as the value chain approach, expand and diversify market opportunities for raw agricultural materials, take a consumer-oriented approach, link smallholder farmers to markets and generate income and employment. They encourage the development of infrastructure and institutions required for economic growth and contribute tremendously to sustainably reducing post-harvest losses in the region. Value chains continue to operate in parallel with traditional “production driven” supply chains that feed mass markets in the region and sustain high levels of post-harvest losses and generally poor quality outputs.
3. This paper reviews current trends, challenges and constraints faced by agrifood systems in the region, while highlighting differences between modern value chains and the traditional supply chains that predominate across the region. It discusses key requirements for developing value chains and reducing post-harvest losses in traditional supply chains, as well as mechanisms for upgrading traditional supply chains to reduce losses and empowering small-scale farmers to effectively participate in value chains. The paper reviews initiatives and actions taken by FAO to reduce post-harvest losses and develop value chains that integrate smallholders. Recommendations for further action by governments and FAO are proposed.

II. Trends, challenges and constraints

4. Agrifood systems worldwide and across Asia and the Pacific region are currently in a phase of change. Rapid income growth and high urbanization rates, an increasing number of women in wage employment and the movement of people, ideas and goods brought about by globalization are contributing greatly to changing diets in urban centres across the region. These factors also are resulting in an emerging middle class that is increasingly demanding higher-value fresh foods, ready-to-eat, ready-to-cook and processed foods, while expecting these products to be compliant with safety and quality standards.
5. Since the middle to late 1990s, the region has undergone a “supermarket revolution” that has brought about growth, modernization and changes in agrifood procurement systems. A growing number of emerging agribusinesses, such as fast food chains and hotels, also collectively provide significant new opportunities for market-oriented production.
6. Public mandatory standards relating primarily to human and animal safety have become more extensive and stringent. Private-sector standards, and particularly standards developed by coalitions of private companies and business associations such as GlobalGAP, have become more important requirements in accessing export markets. Import companies increasingly are involved in coordinating the production and marketing of produce in the region. Among retailers and consumers in urban centres and export markets, there also is a growing interest in learning how their foods are produced, the working conditions of people employed in the agricultural sector and the environmental impact of production.
7. Having access to safe and nutritious food that is affordable to the poor and vulnerable is a challenge in a number of countries, and currently food prices in the region remain high relative to pre-2007 prices. In the traditional supply chains that feed the mass market, post-harvest losses are high,

awareness of quality and safety management practices is low and smallholder farmers who supply the bulk of the region's food requirements are becoming less competitive and increasingly vulnerable to marginalization because of low productivity and poor quality outputs. Small- and medium-scale processors that are key players in the region's food processing sector must increasingly compete with larger-scale food manufacturers that benefit from economies of scale. They are often overlooked in policy initiatives geared towards supporting developments in the agro-industrial sector.

8. Smallholder farmers participate primarily in traditional supply chains that are highly driven by production (see Table 1). They lack technical knowledge and competitive and organizational capacities to address the challenges of meeting market requirements for safety, quality, consistency and timeliness of supply, as well as the capital to invest in acquiring new technologies to upgrade their practices. Their production levels are limited by the size of their holdings and weaknesses in the land tenure system. They often lack contact with market players and are increasingly threatened and bypassed by new value chains that generally embrace large and commercially oriented investors and which are able to access the knowledge and technology required to meet market demand. These new value chains threaten smallholders because they often replace an old chain in which the small-scale farmer participated.

Table 1: Characteristics of modern and traditional value chains¹

Characteristic of value chains	Characteristic of traditional supply chains
<ul style="list-style-type: none"> • Consumer oriented • Focus on processes • Differentiated products • Integrated systems • High quality • Grading and private labelling • Attention to food safety • Use of post-harvest technology • Value creation • Logistics as backbone • ICT as enabler • Consumer pull market 	<ul style="list-style-type: none"> • Product oriented • Fragmented production units • Multi-layered channels • Undifferentiated products • Minimal value added • Predominance of wholesalers • Production push market • High levels of post-harvest loss

III. Value chain development and value creation

9. Agricultural value chains are organized links among groups of producers, traders, processors and service providers who join together to improve productivity and value added. Value chains uniquely integrate sources of raw material supplies with the dynamics of food demand through market-focused collaboration among different stakeholders who produce and market value-added products. Value chain development is about business linkages that promote collaboration among stakeholders in the chain to generate value for consumers and assist small-scale farmers in developing long-term, sustainable linkages to higher value markets. If value chains are to meet the promise of poverty reduction in the region, they should include the smallholder, and that is not something that comes naturally.

10. Through their participation in value chains, smallholder farmers are able to increase their competitiveness (see Table 2) for identified higher-value markets rather than trying to sell what they have already produced traditionally. All participants within a value chain have a financial stake and can make decisions and bear liabilities that affect the value of outputs to the consumer. By

¹ Adapted from Arshad, F.H., Mohamed, Z. and Latiff, I.A. 2006. Changes in agrifood supply chains in Malaysia: Implications on marketing training needs. FAO/AFMA/FAMA Regional Workshop on Agricultural Marketing.

consolidating their interests, smallholders in value chains can achieve economies of scale in buying inputs and selling their products.

Table 2: Characteristics of an effective value chain²

Features of an effective value chain

- Differentiated products
 - Continuous innovation in products, technologies, management, marketing, distribution
 - Creation of higher value adding along the chain
 - Formation of alliances to achieve coordination
 - Expansion of transactions beyond spot markets that include contracts, vertical integration and networks
 - Introduction of practices to meet environmental and social responsibility concerns
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11. Value chain development can have a positive impact on employment in rural and urban areas (i.e. through off-farm processing and income diversification), offer market access to smallholders and create business linkages to small and medium enterprises (SMEs). Value chains also can serve as a vehicle by which new forms of production, technologies, logistics, labour processes and organizational relations and networks are introduced to small farmers. Value chain activities also provide incentives for sound environmental management. With their combined effects of employment gains and food security, efficient value chains can play a key role in reducing poverty in the region.

IV. Status of post-harvest losses and value addition

12. Post-harvest losses generally refer both to *quantitative* (weight or volume loss) and *qualitative* (losses in nutritional value, physical condition or physical characteristics) reductions in the amount and value of food. Losses can take place at any point in the harvest-to-market chain and represent a lost opportunity to consume, sell or trade foods to improve livelihoods. In most countries of Asia and the Pacific region, losses are highest at the producer end of the supply chain, mainly because of spoilage and pest contamination. In rural areas across the region, losses and waste at the consumer end of the chain tend to be minimal because food that is not consumed is often used as feed for animals. With changing shopping and consumption patterns, urban food waste could likely emerge as an issue in urban centres of the region. The levels of losses sustained in traditional supply chains are significantly higher than those sustained in modern value chains.

13. Post-harvest losses of rice in traditional supply chains across Asian countries have been estimated at 10–15 percent and, when combined with the loss of quality, represent a potential loss in value (i.e. quality and quantity) of 25–50 percent at the market (International Rice Research Institute, undated). Smallholders suffer disproportionately from these losses because of the lack of proper storage infrastructure, poor road conditions that increase logistics costs and inadequate milling facilities. They often are forced to sell unmilled rice on a pick-up basis at very low prices. Quite often they must purchase rice on the market when prices are high, because of seasonal fluctuations. They must also apply pesticides to reduce spoilage of their rice crops pre- and post-harvest. This practice adds cost and, depending on the type of pesticide used, can have negative environmental and health effects.

14. Physical losses in traditional supply chains across the region for highly perishable horticultural crops range between 15 and 50 percent. These losses are largely due to the prevalent high ambient humidity and temperature conditions, coupled with improper handling, poor basic infrastructure, an inadequate post-harvest specific infrastructural support base, poor packaging, inadequate and unsuitable transportation inadequate market facilities and logistical support systems and stakeholders'

² Asian Development Bank, 2010. Special evaluation study on support to agriculture value chains development for inclusive growth.

limited knowledge of the post-harvest supply system. In many of the region's markets, few incentives or premiums are provided for high-quality produce.

15. Multi-layering in traditional horticultural supply chains and the inadequacy of road and transport infrastructure across the region contribute greatly to losses in perishable horticultural crops and extend the time frame required for produce to travel from the farm to the market. The large number of intermediaries involved in handling produce in this type of chain results in poor quality and increased marketing charges and costs. In more streamlined modern value chains, post-harvest treatments are applied, marketing channels are more direct, temperature is better controlled and improved packaging systems are used to transport produce. Therefore, losses are significantly reduced and produce is of better quality on arrival at the market.

16. Losses result in wastage of human resources, energy and inputs (e.g. fertilizers, seeds and water) for production. They increase the cost of food and reduce returns to farmers. Losses also impose pressure on the environment as smallholders try to compensate by increasing and intensifying their production. Environmental damage is particularly critical in situations where poor rural households must farm in fragile ecosystems or on marginal lands.

17. Reducing the loss of food that is already produced can be a strategy to increase food supplies, in addition to increasing production. The application of sustainable post-harvest technologies and systems to reduce post-harvest losses in traditional supply chains that feed mass markets across the region warrants priority attention in addressing food and nutritional security.

18. There is increased demand for value-added products and processed foods that are packaged in convenient formats, in response to consumer retail pull, particularly in urban centres of the region and in export markets. Consumers' cultural preferences drive the region's processed food sector and generate export market opportunities where large populations of the region's diaspora reside. There is a growing demand for specialist branding of value-added and processed products in the region's supermarkets and export markets. However, much of this branding is undertaken by large regional and extra-regional multinational companies, which use local raw materials to tailor food products to meet local consumer tastes.

19. By and large, SMEs in the region are very poorly equipped with the technological requirements to assure quality, safety and efficiency in their production chains. They lack proper linkages within their supply chains to assure consistency of supplies and skills required to respond to growing and changing consumer demands through product development, product innovation or packaging innovations. Most smallholders and SMEs in the region face challenges in meeting consumer requirements for value-added products (e.g. cleaned, graded or labelled produce) and ready-to-cook processed foods. They also are challenged to comply with public-sector food safety regulations, private standards and technical protocols and integrated quality management systems.

V. Priority needs for value chain development and post-harvest loss reduction

20. Value chain competitiveness hinges on the efficiency of the physical transformations that take place at each stage of the value chain as well as coordination among the various stages within the chain. Traditional supply chains also would benefit greatly from improvements in inputs, infrastructure and support services.

Technology

21. Technology plays a critical role in achieving value chain competitiveness. At the production level, technologies that improve access to germplasm and that contribute to productivity enhancement are critically important in improving smallholder productivity.

22. Post-harvest technologies designed to improve grading, cleaning, sorting, cool and dry storage, packaging and labelling are key requirements for improving raw material value to end users. Processing technologies are needed to address the food processing and preservation needs of the region's rural, urban and export markets. The environmental soundness of these technologies and the reusability and recyclability of their by-products are also critically important.

23. Diagnostic technologies are required to rapidly pinpoint sources of contamination in order to respond to consumer demand for safety assurance. Information and communication technologies facilitate food safety monitoring and support traceability and the flow of information within food value chains.

Logistics

24. In order to minimize uncertainties and balance product supply with demand, there is a need to plan, forecast and manage the forward flow of products and the forward and reverse flow of services and information within value chains (see Figure 1). Transportation, storage and information and communication facilities are required to support efficiency, reduce costs and ensure strong linkages among value chain stakeholders in logistics networks.

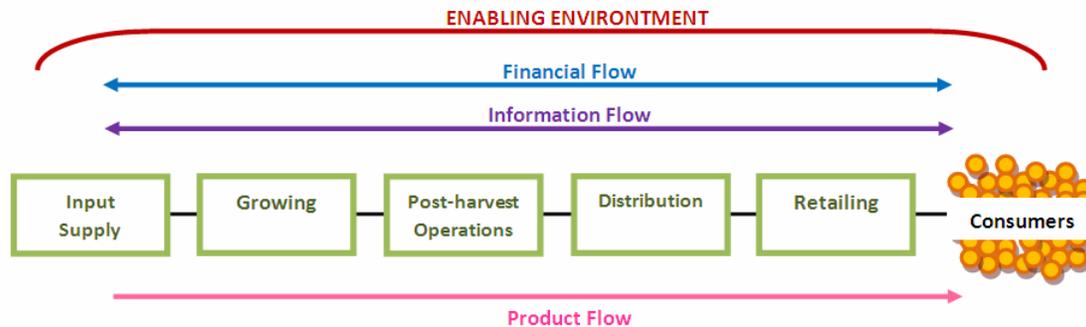


Figure 1: Key elements of a value chain for horticultural produce

Information management

25. It is very important to maintain auditable records of inputs, farming operations and produce handling operations in order to access higher-value markets that increasingly demand information about the “identity” and origin of fresh and processed products. Labeling systems also are increasingly required to facilitate the real time traceability of product identity and origin. Therefore, information management is becoming more important in allowing smallholders to maintain and manage records and to address labeling issues.

Certification

26. Certification systems are increasingly required to assure that production and post-harvest handling practices are compliant with public and private standards for farm and post-harvest handling. Voluntary food certification labels are becoming more important in assisting small-scale producers to target specific segments of consumers, which helps them gain a competitive advantage in markets.

Access to finance

27. Smallholders and SMEs in the region require access to finance on suitable terms, whether to pursue new ventures, expand operations or invest in upgrading operations and technologies to access new market opportunities. Value chain linkages can be used to increase access and reduce costs and risks of financing. This can be through direct financing within the value chain partners or through banks which are more willing to lend to smallholders and SMES when they can use the value chain linkages to reduce their costs and risks of lending.

Market infrastructure

28. Well-equipped wholesale and retail market facilities that are hygienically maintained are particularly important sales outlets to market and store the outputs of modern value chains. Retail wet markets continue to be the centres of food procurement by most people in the region, and particularly by poor and vulnerable groups.

Access to support services

29. Compliance with quality and safety requirements necessitates having access to support services such as laboratory testing and certification services. Equipment maintenance and repair services are equally important support requirements to assure technological performance. Business services that help to improve quality and efficiency of processes, reduce costs and expand operations are particularly critical to smallholder farmers, small enterprises and new start-up companies whose transactions costs are large relative to the size of their output. Small-scale farmers who participate in traditional supply chains are also heavily dependent on government extension support services for technical input and support in production and post-harvest handling.

Human resource capacity

30. Value chain development and post-harvest loss reduction require specialized competencies in a range of technical fields that address technical, organizational, logistical and business requirements. This necessitates equipping value chain stakeholders with a multitude of skills through academic, practical and vocational training activities that nurture entrepreneurial skills development. Skills training also can be used as a targeting mechanism to integrate women into value chains.

VI. Enhancing the participation of smallholder farmers in value chains

31. A number of innovative institutional models that can help small-scale farmers benefit by linking into value chains are emerging across the region. In some cases, these models are unique to the region.

- Producer organizations play a critical role in reducing post-harvest losses and in overcoming the costs associated with dispersion of producers; diseconomies of scale; poor access to information, technology and finance; meeting market requirements for volume, quality and traceability; and management of risk in value chains.

Business models that include small-scale farmers go a long way towards helping them become better integrated into markets. Many private-sector companies are currently adopting new business models that integrate those living at the base of the global economic pyramid into their value chains as consumers, producers and/or distributors. Such inclusive business models build bridges between business and the poor for their mutual benefit in the supply chain and marketplace. Benefits go beyond immediate profits and higher incomes. They drive innovations and new opportunities, build markets and reduce risks and losses, while enhancing poor people's capacity to add value and providing them with better remunerated forms of employment and sustainable earnings. The notion of inclusivity in value chain development is being promoted in the South Asian subregion where the Dutch agency SNV has developed "inclusive business" approaches in Bangladesh, Bhutan and Nepal based on experiences in Latin America.

- Contract farming is defined as agricultural production carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and marketing of a farm product or products.³ Contract farming is becoming increasingly popular for supplying agricultural products in many countries of the region, in order to improve reliability of raw material supplies and to assure quality and compliance with export market standards. Well-designed, successfully implemented contract farming models are key success factors in generating income streams to the region's smallholder farmers.

³ Contract Farming Resource Center <http://www.fao.org/ag/ags/contract-farming/en/>

The organic asparagus supply chain of the Swift Co., Ltd. in Thailand is an example of a successful case of contract farming between the private sector and poor landless households, who, by organizing into producer groups to grow organic asparagus, can comply with the private standards of export markets in the United Kingdom and Japan; as a result, they have doubled their earnings. The Swift Co. Ltd. provides the farmer groups with technical assistance, training and post-harvest infrastructure.

While contract farming might lead to improved coordination along the value chain, technological change and innovation and higher value, there is also a perception that contracts might be disadvantageous to some weaker groups, including agricultural workers and women. Several problems associated with contract vegetable production in Punjab State in India have been reported, including an imbalance of power between farmers and companies, violation of the terms of agreement, social differentiation and environmental unsustainability.⁴ Therefore, appropriate government regulation will be needed. Regulations must be strong enough to uphold laws and contracts, but not so strong as to discourage investment that could create jobs and value added.

- Clustering involves forming informal groups of smallholders who commit to undertake a common marketing plan for a particular product (or set of products) for identified markets. Each product cluster has a designated lead farmer who coordinates the production of all the farms in the cluster. Clustering promotes the provision of “bundles” of services and enhances access to markets and information. Clustering offers improved economies of scale, the ability to handle large product volumes at low transaction costs and effective linkages with government and private resource organizations.

NorminVeggies in the Philippines is an example of a model industry cluster that has enabled small-scale producers to overcome barriers to entry in modern markets. Through clustering, small-scale vegetable farmers are able to be active players in the supply chain, meet the basic demands for volume and quality consistency and link to dynamic markets such as fast food chains, processors and supermarkets.

- In India, “hubs” (or “platforms” or “parks”) bring together various companies and services that link small-scale farmers to markets. “Hubs” provide missing services (e.g. output procurement, processing/packaging/cooling, technical assistance, credit and insurance) and products (e.g. inputs and equipment) that are required to enhance the competitiveness of small-scale farmers.⁵
- The private sector⁶ is a key supplier of goods and services to nearly all developing and developed countries of the region. Where markets are weakly integrated, private-sector actors provide inputs and credit, buy products and sell in local markets. In areas where there are better functioning spot markets, private-sector actors provide more and better quality services, including access to improved inputs, upgraded production and processing technologies, technical support and stronger market linkages. Where modern value chains are being developed, often involving contractual arrangements and stringent market entry requirements, local food manufacturers, commercial farmers, input supply firms and exporters continue to play an important role, and other private-sector actors (e.g. transnational firms and commercial banks) can, and often do, become important drivers of agricultural development.

⁴ Singh, S. 2002. Leveraging contract farming for improving supply chain efficiency in India: Some innovative and successful models. <http://globalfoodchainpartnerships.org/india/Papers/SukhpalSingh.pdf>

⁵ Reardon, T., Timmer, C. P. and Minten, B. 2010. Supermarket revolution in Asia and emerging development strategies to include small farmers. www.pnas.org/cgi/doi/10.1073/pnas.1003160108

⁶ Engaging the Private Sector in Agricultural Development, COAG, 2009

- A key role for governments in value chain development and post-harvest loss reduction is to provide an enabling environment through suitable policy reforms; investments in basic infrastructure (e.g. roads, water, telecommunication facilities, Internet access and electricity and marine transport facilities in the case of island states); investments in post-harvest infrastructure (e.g. pack houses, warehouses and storage facilities); infrastructure for traditional and modern value chains; and market infrastructure for traditional value chains. Also, productivity-enhancing technologies must facilitate traditional supply chains. Public-sector support must encourage private-sector investment in linking small-scale farmers and consumers. In so doing, governments need to create an enabling environment for private-sector activity by developing regulations that facilitate doing business and by providing incentives.

Governments also must play a critical role in supporting the development and strengthening of producer/farmer organizations. At the same time, they need to provide services to those small-scale and marginal farmers and landless labourers who are not serviced by a competitive private sector but who provide food for the mass markets. Through regulatory mechanisms, governments can facilitate the provision of business development services and business linkages that support the integration of small-scale farmers into formal markets.

Governments must address a range of important enablers of value chain development and post-harvest loss reduction, such as norms, standards, regulations and policies that govern production, processing and marketing; research and development; access to financial services that focus on SMEs and smallholders; and rural transportation. Policies that govern food safety and the sustainability of value adding and processing technologies must be addressed across all developmental scenarios and at all technological levels. Food quality and safety policies must provide for the development and enforcement of appropriate regulations and for the implementation of integrated quality management systems that assure safety in food value chains.

- Successful public-private partnerships⁷ require a well-organized private sector with effective farmer business organizations that are supported by governments. A number of mechanisms have been used to share the responsibilities and risks between the two sectors in the region. These include: contracting service delivery tasks to the private sector, financed by a combination of public funding and private payment; delegating service provision to non-government or membership organizations financed by levies, membership fees or public funding; and joint ventures between the government and the private sector.

VII. Regional initiatives and actions to be taken

32. A number of initiatives are ongoing at the regional level to empower small-scale farmers in addressing value chain development and reducing post-harvest losses. FAO, in cooperation with member governments and with the support of donor agencies, is actively engaged in value chain development and post-harvest loss reduction across the region. For example, the first Regional Agro-Industries Forum for Asia and the Pacific (RAIF-AP), jointly convened in 2009 by FAO, the International Fund for Agricultural Development (IFAD), the United Nations Industrial Development Organization (UNIDO) and the Shaanxi Provincial People's Government of China, focused on promoting dialogue among the private sector, governments and smallholders in the region.

33. FAO's current work in value chain development and post-harvest loss reduction in the region focuses on the following thematic areas:

- strengthening the capacity and competitiveness of small-scale producers to meet market requirements and link to markets and value chains;

⁷ Market-oriented Advisory Services in Asia – a Review and Lessons Learned, RAP publication 2011/02

- strengthening public-sector and private-sector support to small agro-entrepreneurs in agribusiness and agro-industry development;
- strengthening institutional frameworks that support an integrated food chain approach for food safety/quality management;
- effectively designing and implementing risk-based programmes of food safety quality management and control, in accordance with international norms; and
- strengthening the capacities of small-scale and lesser-developed stakeholders in supply chains in production and food enterprises to implement safety and quality management.

34. Some of the most significant problems in agricultural value chain development projects and in post-harvest loss reduction across the region include: the lack of technical knowledge, appropriate technology and information; the limited knowledge and skills of post-harvest handlers and smallholders, particularly in the areas of quality and safety management, business management and marketing; lack of information; and inefficient channels of distribution. Further, few policies and programmes are targeted towards including small-scale farmers in new value chains.

35. Across most of the region, there are either no strategies or poor implementation of strategies to improve policies that govern access to credit, legal and regulatory frameworks, institutions and services. Also, there are inadequate frameworks to support an integrated food chain approach to manage food safety and quality, and where they do exist, there is limited enforcement of regulations. Quite often, value chain development and strategies for post-harvest loss reduction are not prioritized in country-level programme frameworks and strategic plans for agricultural development. Market information systems and financial institutions and services for market-oriented farmers and SMEs are weak. Poor basic and post-harvest infrastructure in many countries also impedes market access and increases the cost of doing business.

36. On the other hand, the gradient of developmental contexts across the region provides considerable opportunity for knowledge exchange and learning. Smallholders would benefit greatly from exchanging knowledge on successful value chain models and post-harvest management systems.

37. While regulations are necessary to assure food safety, many standards and quality systems pose a great technical challenge and cost to smallholders and SMEs and also pose non-tariff barriers to trade. Harmonization, equivalence and simplification of standards and regulations could greatly reduce the costs of certification to enhance trade and facilitate market access for small-scale producers and processors.

VIII. Conclusions and recommendations

Conclusions

38. Agrifood systems across Asia and the Pacific region are currently facing growing and changing market opportunities. While these opportunities could greatly benefit smallholder farmers, they also present risks. Realizing the benefits while averting the risks will require that public and private sectors share investment costs and risks in market-oriented interventions that enhance smallholders' competitiveness and facilitate their entry into value chains.

39. To address food and nutritional security, it is important to pay attention to reducing post-harvest losses and addressing safety and quality issues in traditional supply chains that serve mass markets. This will necessitate strengthening the capacities of small-scale, marginal and landless farmers who participate in these traditional supply chains.

40. Realizing the potential of value chain development and benefitting from post-harvest loss reduction in traditional supply chains will require addressing a number of key issues, including the development of supportive policies and the provision of infrastructure, support services, capacity building and technical support in a number of areas.

Recommendations

41. Smallholder farmers must become better organized in order to benefit from the growing market orientation of agrifood systems. The private sector also will be becoming increasingly important in linking smallholders to markets. Therefore, governments must institute support mechanisms to facilitate smallholder organization and to support private-sector development to enhance smallholder competitiveness, which leads to benefits on both sides. To meet this end, the Conference may wish to recommend the following actions from governments:

- Governments must recognize the importance of value chain development for linking smallholder farmers to growth markets and the significant importance of post-harvest loss reduction in addressing food and nutritional security issues. They should prioritize these issues in their country-level programme frameworks, policies and strategic plans for agricultural development.
- Governments should work towards creating an enabling environment that is supportive of value chain development. Policy objectives to meet that end must integrate consideration for: the ease of doing business; the development of basic and post-harvest infrastructure; food safety and quality regulations; accreditation and certification systems that meet market needs; and protection of intellectual property rights.

42. Many small-scale and marginal farmers and landless labourers are linked to the traditional supply chains that supply food to mass markets across the region. High levels of post-harvest losses are sustained in those chains because of the lack of systematic linkages between operations and stakeholders; inadequacy of post-harvest technologies and market infrastructure; and the lack of fundamental skills and capacities. The Conference may wish to recommend that governments continue to provide assistance to stakeholders in traditional supply chains by providing services (e.g. inputs, basic infrastructure, post-harvest infrastructure and market infrastructure) and technical support and training to reduce losses and to improve the quality and competitiveness of their output in local markets.

43. The Conference may request FAO to further assist member countries in the following areas:

- Improve the capacity of smallholders to maximize value addition and integrate into value chains.
- Promote improved post-harvest technologies, systems and approaches in traditional supply chains that serve mass markets in the region, through technical assistance and capacity development in order to reduce losses and improve safety and quality.
- Harmonize food safety and quality standards, strengthen institutional and legal frameworks that govern food safety and quality systems (including labeling and certification) and establish monitoring and control systems.
- Document, publish and disseminate information on models of success relevant to value chain development, post-harvest loss reduction strategies and direct marketing.