



## SECTION 2

# **The way forward: Mechanisms and recommendations for producers and policy-makers**

By drawing together the current state of knowledge and experience related to potato value chains around the world, the previous section provided the foundations for guiding policy-makers towards formulating development strategies involving the potato value chain.

In this context, the following section presents a forward-looking view of the need to support the potato value chain as a mechanism for increasing income for potato producers while at the same time maintaining the potato's role as an emergency food security crop. It also synthesizes the key issues that emerged from two workshops held during the International Year of the Potato as well as the key policy recommendations of the workshop participants.



# Potato in the national and global economy

## Supporting the value chain to increase potato producers' income while maintaining potato's role as an emergency food security crop

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**T**he crisis that followed the 2007–2008 global escalation of food prices revealed the fragile state of food security and the vulnerability of countries in many parts of the world to external shocks. In many cases, high commodity prices did not spur farmers in developing countries to invest and increase production. Looking back, this was because high price signals did not transmit to them and their access to affordable inputs was limited. They also faced capacity and supply-side constraints. In fact, inappropriate policy measures plus a lack of technology, insufficient infrastructure and institutions, and price controls and tariff reductions actually reduced incentives for producers to respond.

There is a need to strike a balance between protecting consumers from higher food prices and maintaining incentives for investing in increased production and improving supply responses. When prices are low, the importance of incentives to sustain food production becomes all the more important. Policy measures need to be targeted, non-distortionary (in the market price sense) and positive towards agricultural investment. But what can be done? The issue might be better addressed by first examining what should be avoided.

### **Avoid short-term solutions**

At the height of the crisis of escalating food prices and in its aftermath, policies were proposed to subsidize seeds and fertilizers. However, input subsidies do not necessarily target the poorest and the strategy depends on continued donor support, thereby raising questions of affordability in the event of rising fertilizer prices. Since the scheme is subject to state patronage, it breeds farmers' dependence on the state. Such short-term alleviation is, in reality, a form of food aid.

Governments in many countries also resorted to a host of other measures under the umbrella of "price stabilization policies". These included measures such as price controls through administrative orders, antihoarding measures and sales of public food stocks (where they existed) with a view to lowering market prices. Experience has shown that these measures check food prices in the short run, but maintaining stocks is a high cost operation. In addition, the longer term strategy of releasing public stocks to hold down prices can be a disincentive for producers and traders, discouraging production expansion and investment. In countries with porous borders, there is a risk that the benefits of interventions –



particularly those designed to support domestic producer prices or to subsidize consumer prices – will be eroded by cross-border trade.

Moreover, market intervention strategies assume that the commodity price shock is temporary and will reverse itself in the short run. While booms and busts occur regularly in world commodity markets, shocks to the prices of many primary commodities are typically long lasting and, thus, likely to depress prices for a long time. In such circumstances, government-supported price-stabilization activities are likely to be ineffective, and external borrowing for smoothing consumption is likely to be unsustainable.

Trade policy measures also tend to feature heavily in response to volatile international prices. When prices are on the rise, reducing import tariffs may increase the volume of imported food thereby easing the strain on domestic prices. However, there needs to be an initial scope to reduce tariffs enough to offset price increases. Yet the tariffs of many developing countries are not high enough to start with – so their reduction would not be sufficient to stabilize domestic prices.

Where scope does exist, a prolonged cut to import tariffs could expose domestic sectors to competition. While genuine and fair competition should not be deterred on the grounds that it can spur efficiency gains, the arrival of subsidized imports into domestic markets could significantly undermine productive sectors.

Similarly, by diverting food volumes that would otherwise have been exported, the pressure on domestic prices is reduced. However, the export restrictions may reduce incentives to producers, eventually resulting in a decline in productivity and production and, in effect, reverse the decline in prices that the policy

initially intended to achieve. In an even larger picture, the main criticism of export restrictions is that they make the international market smaller and can exacerbate price instability in world markets, thus hurting consumers in other countries. This is especially true if the country imposing the export restrictions is a significant exporter of the product in question or if internationally traded volumes are small.

The longer-term solution to this problem is to promote measures to nurture various elements that will ensure that food markets function well and are competitive. To ensure that food systems thrive, it is important to provide market-based incentives and channel them through to economic agents and to ensure that risks are shared and risk-taking is rewarded. By concentrating efforts around the value chain, the twin objectives of food security and a sustainable market-orientated food system can be realized.

## Identify sustainable, longer-term solutions

Diversifying a country's food base is an important challenge facing countries exposed to international food price shocks. Promoting supply chain development for a wider set of crops can lead to more stable farm revenue and consumption patterns. This will typically necessitate coordinated systems of input delivery, finance, and commodity marketing for a range of crops that offer higher returns to farming in the changing environment of rural economies.

Such investments would represent a shift from the strategy of price stabilization and price support for a dominant staple foodstuff to a portfolio approach. This puts greater emphasis on value chain development for a range of promising commodities and minimizes the impact of

domestic food price instability by lowering exposure to international market volatility.

### Value chain coordination

An array of institutional arrangements typically governs the coordination of major supply chains of agricultural commodities in developing countries. Since transactions at the producer stage have a significant economic impact on smallholders, various efforts have been made to ensure that an equitable distribution of income accrues to farmers. Generally, the greater the participation of farmers, the greater their potential for economic benefit. Value addition typically occurs at any given stage of the supply chain, making it very important for policy-makers to create a suitable economic and institutional environment that will facilitate farmers' participation..

Recently, the Fourth Session of the Intergovernmental Group on Banana and Tropical Fruits discussed models of value chain coordination at the producer-processor stage. The models under review were of particular relevance to potato value chains, since both types of commodities share characteristics such as perishability, high transportation costs and high potential for value addition.

It is difficult to recommend a particular model, since much will depend on the institutional, social, cultural and economic backdrop in which potatoes will be produced, marketed and consumed. Generally, however, those value chain models that mitigate risks to participants, promote mutually beneficial gains from exchange and attract investment in the particular sector should be encouraged by policy-makers and alike. The list below discusses some of the more prominent or promising models of farmer-processor coordination.

- **Contract farming** establishes conditions for the production and marketing of a commodity. Typically, the farmer agrees to provide established quantities of a specific agricultural product, meeting the quality standards and delivery schedule negotiated with the buyer. In turn, the buyer commits to purchase the product, often at a pre-determined price. In some cases, the buyer also commits to support production through, for example, providing farm inputs and technical advice or arranging transport of produce to the buyer's premises.

If the contract is fully respected by both parties, farmers can have better access to product and input markets at a lower risk and buyers will have assured quality and timeliness in the delivery of farmers' products. The practice of "side selling" – farmers also sell to competing buyers – can be a problem of contract farming. However, the major concern is the potential for buyers to take advantage of farmers over the contracted price, since their bargaining power is invariably greater than the farmers'.

- **Unrestricted contracts** adopt most elements of contract farming except that the buyer allows the farmers to side sell if the market price is higher than the contract price. To ensure the timely supply of potatoes and to avoid large transaction costs in implementing contracts with a large number of small growers, the buyer (firm) may employ a "factory-supply basis and smallholder model". Under this model, the firm establishes its own supply standards by providing technologies, production inputs and extension services to a small number of



large-scale growers, agrees to procure all products and guarantees growers a fixed revenue per ha. The firm has an obligation to procure the quantity of output specified in the contract from farmers at a negotiated price based on prevailing market conditions. Farmers have the freedom to sell to other buyers if they can obtain a higher price.

In this way, contractual disputes are generally avoided and farmers receive an equitable price. However, there is no guarantee that farmers will be able to obtain their fair share of income over the supply chain because of potential price distortions at the local market. In particular, farmers do not receive the value-added from processing or market expansion because they are restricted to supplying the chain with just potatoes.

- **Contract farming with multi-step payments** is one of the most difficult problems is to design a contract structure that deters side selling. If the predetermined transaction price is too low compared with the market price after harvesting, farmers may sell their product to competitive buyers or, if the contract price is pre-set too high, the processor risks losing its competitive edge because of higher raw material costs. A “two-step payment scheme” has been developed to address such risks and has been adopted in various supply chains throughout developing countries.

All the major parameters of the two-step payment scheme are the same as a regular farming contract except that farmers receive two or more payments for their output. The first payment, which is often lower than the prevailing market price, is made when

farmers deliver their product to the next stage of the chain. The second payment comes, for example, after the manufacturer completes the sale of its processed product sales. Depending on the contract design, this payment can be the balance of the contract price, the difference between the pre-estimated price and the prevailing market price, or a bonus as part of a profit-sharing scheme.

Since prices can be updated throughout the season to reflect current market incentives, the main advantage of a multi-step payment is that risks are shared and potential contractual disputes between farmers and manufacturers are avoided.

- **Joint ownership** under this model, value chain participants retain a share of the ownership and management of a processing factory based on the size of the initial investment they made towards its establishment. In the case of farmers, their provision of contracted land to supply produce to the factory would make them stakeholders in the enterprise.

Value chain stakeholders form the board of directors which oversees business development of the enterprise, including strategy and decision-making. Accordingly, farmers – whose interests are usually represented by a cooperative – assume a seat at the board. All stakeholders are allocated certain responsibilities, based on their roles in the value chain. Farmers, for instance, are required to ensure that both the necessary quantity and quality of potatoes are delivered on time. With assistance from the local government, the farmers' cooperative provides technical support and training to



members as well as agricultural inputs such as seeds and fertilizers. Contracts govern farmer-processor coordination in the value chain, stipulating the quantity, quality, time, and terms of payment term plus the measures necessary for enforcement. Allowing farmers to part own and manage the processing factory, the potential for profit sharing provides additional incentive for them to deliver on contracts and to invest in their own farming enterprises.

## Ensuring food security

The enormous challenge in terms of food security comes when markets are not in equilibrium. Crisis in international markets, domestic food shortages and gluts can strain value chains to the extent that they no longer function efficiently or, in the extreme, become redundant. In times of food surpluses, the very design of the value chain should ensure that incomes are sustained, since potato can be transformed into a host of high-valued products.

However, in times of basic food shortages, farmers could be compelled to break contractual arrangements by side selling, or their raw material – ware potato tubers – may become the target of government intervention to bolster food security. However, there are market-based interventions to value chains that could strengthen food security in such times of crisis.

One such instrument is the use of options. An option is a contract between a buyer and a seller that gives the buyer the right – but not the obligation – to buy or to sell a particular quantity of a commodity, such as potato tubers, at a later day at an agreed price. In the context of food crisis management, the buyer would be the state while the seller would be the producer in the value chain. The basic idea is that when food shortages are declared, the state

would exercise the options contract to divert predetermined quantities of tubers for basic food supply at affordable prices, while paying farmers the prevailing contract price agreed with the processor. The decision to declare the shortage should rest on an independent authority, such as FAO or the UN World Food Programme (WFP).

An insurance plan could be sought by the state that would compensate processors for the loss of revenue, or those processors who are sufficiently diversified in raw material use (i.e. they are involved in other agricultural commodity value addition) would be permitted to enter the scheme. The state also could hedge against the cost of the scheme by taking out options on an international or regional commodity exchange, such as CBOT of Chicago or SAFEX of South Africa.

It is assumed that organized, sophisticated exchanges do not exist in the country undergoing the food crisis. The volumes purchased should be made transparent to the public, so that private food traders can factor possible market impacts of such state interventions into their commercial calculations.

Of course, the scheme could be subject to modification and fine-tuning, but the basic premise stands: value chains and their proper coordination can provide incentives for productivity-raising investments, can foster higher incomes to participants and, during times of crisis, market-based interventions to the value chain can produce non-distortionary impacts that enhance food security and bring long-term stability and sustainability to food systems.





# Synthesizing key issues and recommendations for producers and policy-makers

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**T**he International Year of the Potato helped raise global awareness of the critical role the potato plays in the food security strategies of poor farmers as well as its newly expanded role in meeting the needs of an increasingly urban world that depends more and more on processed foods. In addition, the International Year contributed to the understanding of the potential to add value to the potato by supporting and improving the coordination of the potato value chain.

The current state of potato value chains in developing countries was reviewed during “Potato Science for the Poor”, a conference sponsored by CIP and FAO in Cuzco, Peru, in March 2008, as part of the International Year of the Potato. Papers presented by representatives of the public and private sectors covered the entire value chain:

- identifying key constraints to a better functioning value chain, especially the problems of ensuring quality seed that can provide the chain with a consistent, quality product;
- understanding how value chains can be re-engineered to enhance food security and

rural development, and counter cereal price inflation; and

- identifying how development agencies, national authorities and the private sector can support value chain activities.

A follow-up session, co-sponsored by FAO and CFC at FAO headquarters in Rome in November 2008, provided the opportunity for participants to build on the synthesis of key issues that had emerged during the workshop. They worked together to develop the kinds of policy recommendations that could contribute to strengthening the potato value chain in developing countries.

This section synthesizes the key issues that were discussed at the meetings as well as the key recommendations. Further, it presents the recommendations according to the seven value chain drivers identified in the workshop paper “Value chain theory and application”, namely: enabling environments, technologies, market structure, chain coordination, firm management, inputs and product demand. Specific policy recommendations developed by the workshop participants are presented for each driver.



## Policy recommendations

### Enabling environment

Despite the fact that global food production has doubled in some parts of the world in the past half century, many individuals and communities in developing countries still lack access to sufficient food supplies throughout the year. The potato is a highly recommended, nutrient-rich food security crop that can shield low income countries from the risks posed by rising international food prices, while at the same time providing a valuable source of income for farm households.

Increasing production and consumption of such crops can reduce food insecurity. However, to do so first requires creating a favourable environment within which agrifood chains can operate efficiently. This means finding solutions that reduce constraints, create opportunities, improve productivity and reduce risks in the farming systems on which the most vulnerable depend.

Potato has generally been neglected in agricultural development policies for food crops despite its importance as a staple food and its potential contribution to combating hunger and poverty. There is a need for policy-makers to realize the importance of potato, *vis-à-vis* other crops, for food security and poverty alleviation. Policy needs to consider mechanisms that protect the unique role that smallholders play in the potato value chain. This is particularly so in the context of achieving the Millennium Development Goals, in that potato can make a significant contribution, *inter alia*, to eradicating extreme poverty and hunger, and reducing child mortality.

### **RECOMMENDATION 1: Emphasize to policy-makers the income equity and food security aspects of potato farming and its potential in achieving the Millennium Development Goals.**

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If the Millennium Development Goals are to be realized, policy-makers need a thorough understanding of the nature and functioning of individual potato value chains. This requires that policy-makers be kept up to date on ongoing developments in the value chain and on the implementable research that can enhance chain performance. It also requires that those responsible for both policy formulation and implementation work together in developing effective potato development plans and policies.

### **RECOMMENDATION 2: Engage policy-makers at regional, national and local levels in preparing potato development plans and policies that encourage potato production and consumption.**

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There is significant scope to create a more enabling environment for potato production in developing countries through the further uptake of affordable technology. Potato production in developed countries has proven that technology exists to achieve yields in excess of 40 tonnes per ha. The challenge for developing countries is to embrace this technology and close the yield gap with developed countries.

Potato producers need to be better informed about existing technologies and how their use can contribute to enabling environments and improve performance. This requires keeping

extension services up to date with the latest technological developments and applications as well as the most appropriate media through which information can be disseminated to farmers. This will necessitate providing regular and appropriate training to extension service staff.

**RECOMMENDATION 3: Translate available technology into usable information and formats for use by extension staff; arrange for training of extension staff in the Participatory Market Chain Approach (PMCA) and the Farmer Field School (FFS) approach, and enhance their capacity to engage with the private sector.**

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Risk is one of the main constraints to potato production in developing countries. Risk reduction strategies provide significant scope to create a more favourable enabling environment for potato production. There are many forms of risk and each form requires the adoption of a different risk reduction strategy, which can be provided by either the public or private sector or by working together in partnerships.

For example, for the public sector, production risk can be mitigated through crop insurance, the adoption of technologies (e.g. use of robust varieties and disease-resistant varieties), the promotion of irrigation equipment in drought-prone areas, adoption of contour farming in areas prone to soil erosion, etc. Similarly, for the private sector, risks of post-harvest losses can be mitigated through the construction of storage facilities and processing capacities, and price and market risk can be

mitigated through vertical integration and forward contracts.

**RECOMMENDATION 4: Promote public policies and private sector initiatives that reduce the risk of potato farming.**

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**Technology**

Technologies associated with production, processing and distribution operations in value chains are essential determinants of chain performance. This includes the methods, processes, facilities and equipment used in the value chain operations plus aspects related to research and development, and technology adaptation and adoption.

The technology for potato production therefore exists, but there is a significant gap between actual and potential performance in developing countries. Even though technological advances have resulted in significant increases in potato production in developing countries, their productivity remains low at 14.9 tonnes per ha – barely a third of what is being achieved in some of the world’s main potato producing countries. Of course, continued technological research is still needed but, at the same time, existing technologies need to be scaled up and scaled out to ensure better accessibility and application for farmers.

As part of the scaling-up process, proven technology needs to be adapted to local conditions to maximize the potential gains. This requires research into making technology more adaptable which, in turn, makes it more accessible and suited to the local environment. This should be undertaken in association with the various value chain actors – researchers,



producers, the private sector and consumers – to ensure that all their needs are considered.

As part of the scaling-out process, the availability and application of existing technologies need to be communicated to all farmers. Not enough attention or effort is given to the dissemination of such information. This requires the translation of technology into usable information and formats for dissemination by the extension service.

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**RECOMMENDATION 5: Scale up and scale out available technologies; allow for local adaptation of these technologies to increase accessibility and effectiveness.**

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Risk-averse smallholder farmers tend to prefer technologies that reduce production risk. Technological advances have resulted in breeding of high-yielding potato varieties but, under adverse conditions, there can be relatively high variations in yield from year to year.

Considerable scope exists to further the development of robust potato varieties that consistently do well under the marginal conditions faced by many farmers in developing countries such as drought, disease and low fertility. Breeding of robust varieties does not concentrate purely on yield maximization. Qualities that provide consistent yields increase the ability of potatoes to contribute to food security and poverty alleviation.

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**RECOMMENDATION 6: Promote the development and use of robust varieties that will perform reasonable well under adverse conditions and over successive years.**

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### **Market structure**

Market structure at each stage of the value chain has a large impact on the chain's overall performance as well as the performance of the individual chain actors. While it is difficult to alter the structure of the value chain in developing countries to promote food security and income generation among smallholder producers, the conduct of individual actors can benefit the entire chain.

For example, organizing smallholders into larger producer groups can benefit the entire value chain. Collective organization and post-harvest strategies, such as storage, can significantly increase the bargaining power of producers while reducing transaction costs, thus benefiting the entire chain. Furthermore, marketability can be improved by pooling production, enabling farmers to create larger potato batches for sale that have been graded and selected specifically for the target market.

**RECOMMENDATION 7: Organize smallholders into producer organizations in order to reduce transaction costs, add value through grading, selection and storage, and gain bargaining power.**

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Linking producers and producer groups directly with other value chain participants, such as wholesalers, processors and retailers, will enable smallholders to meet the specific demands of the value chain, thereby adding value and boosting incomes. Promoting an understanding of the market and the demands of the value chain to smallholders will ensure the right product, in terms of variety, grading and packaging, is delivered to the right place at the right time.

**RECOMMENDATION 8: Directly link producer groups with markets, including wholesalers, processors and retailers.**

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Producers generally have insufficient knowledge of the market to aid their decisions on when and where to sell their potatoes. Increasing their understanding of the market and the demands of the value chain necessitates better provision of market information and greater transparency along the chain. There are good examples of farmers in developing countries making informed marketing decisions when they have received effective price and market information through various channels, including radio, newspapers and mobile phones.

**RECOMMENDATION 9: Promote the availability of market information through media and other channels.**

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**Firm management**

Effective management at every stage along the value chain is necessary if individuals are to allocate resources efficiently, respond to consumer needs and adapt to market changes. While the technology for improved potato production exists, there remains a significant gap between actual and potential performance in developing countries. Effective business administration is often overlooked at the individual level to capitalize on this potential in favor of more technical approaches to further increasing production.

**RECOMMENDATION 10: Provide business development services to producers and producer associations as a complement to technical training.**

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**Chain coordination**

Chain coordination harmonizes the physical, financial and information flows along the value chain and can facilitate performance. However, coordination among farmers to facilitate activities along the value chain is lacking in developing countries.





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**RECOMMENDATION 11: Explore and test ways to coordinate stakeholders in the potato value chain through such mechanisms as platforms, roundtable discussions and commodity associations.**

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**Inputs**

Inputs such as seed and fertilizer, and services such as credit, extension, research and information need to be available and accessible at every stage of the value chain if efficient performance is to be realized. Lack of good quality, clean seed is the most limiting element of the potato value chain and the main reason for poor productivity in developing countries. The availability and accessibility of good quality clean seed has potential to close the potato yield gap between developing and developed countries.

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**RECOMMENDATION 12: Promote availability of and accessibility to good quality clean seed.**

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There is a need to recognize the importance of the informal seed system in providing affordable seed in developing countries. As the informal seed system is the major supplier of seed to farmers in developing countries, effort should be made to link it with the formal seed system so that the benefits of good quality clean seed can percolate down to the farming community.

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**RECOMMENDATION 13: Link informal and formal seed systems.**

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There is a need to link seed production with effective storage, distribution and supply functions in developing countries. For this, efforts need to be made to initiate a strong cooperative movement involving farmer self-help groups, the private sector and public sector agencies.

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**RECOMMENDATION 14: Organize farmers into self-help groups and foster links with private sector seed firms and public sector seed producers.**

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A large number of developing countries grow exotic varieties as they do not have a good domestic variety breeding system in place. A good variety evaluation system is needed to identify those exotic potato varieties most suited to the specific agroclimatic conditions of individual developing countries and regions within countries. To be effective, one also needs to understand the needs of all stakeholders within the value chain (e.g. farmers, processors, retailers and consumers) to ensure all potato quality and supply demands are met.

## Prospects for potato development beyond 2008

The implementation of IYP confirmed that potato will continue to play an increasingly important role as a global food crop, and billions of people around the world will continue to depend on potato as a staple food, high value and cash crop. Prospects for enhancing the potato value chains in developing countries will be achieved through the understanding of the challenges existing in the main three distinct economic typologies in the developing world, as follows.

- **For agriculture-based economies – mainly in Sub-Saharan Africa:** it is crucial to increase productivity. Research for development needs to provide breakthroughs in overcoming intractable problems, such as lack of clean seed potato, diseases such as late blight and viruses, and storage problems.
- **For transforming economies – in many countries of Africa, Asia and the Near East:** The challenge for these countries is to manage intensive systems sustainably, increasing productivity while minimizing health and environmental risks.
- **For urbanized economies – typical of Latin America, Central Asia and Eastern Europe:** The challenge is to ensure the social and environmental sustainability of potato-based systems, and to link small potato producers to new food markets.

**RECOMMENDATION 15: Public and private sector needs to collaborate to evaluate imported exotic seed varieties.**

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### Product demand

Product demand is paramount since value chains cannot perform if demand does not exist. There are many examples of potato producers in developing countries adding value and diversifying into new potato markets. For example, adoption of post-harvest techniques such as grading, selecting and storing, and application of the marketing concept through product, packaging, promotion, place and price strategies has added value and provided access to new markets.

**RECOMMENDATION 16: Increase access to markets for smallholder farmers through diversification.**

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**148** Strengthening  
potato value chains

*“The International Year of the Potato in 2008 raised awareness of the need for a coalition of stakeholders and for increased investment to work toward improving the productivity, profitability and sustainability of potato-based systems and value chains, and encouraged a renewed sense of responsibility on the part of the international community for agriculture and rural development”*

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