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## **Innovative successes through the value chain**

**David Shearer**

*Paper prepared for presentation at the “The Supermarket Revolution In Food: Good, bad or ugly for the world’s farmers, consumers and retailers?” conference conducted by the Crawford Fund for International Agricultural Research, Parliament House, Canberra, Australia, 14-16 August 2011*

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## INNOVATION AND THE VALUE CHAIN

### Innovative successes through the value chain\*

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#### Abstract



The global food crisis has focused attention on agriculture and spurred increased investment in the sector. The attention of public policy and research investment has been focused on smallholder farmers' productivity. However, it is critical to enable opportunities throughout the value chain to improve smallholder farmers' access to market with the associated income improvements. With post-farm losses in the global supply of food estimated to be 10–40%, research throughout the food chain is as important to global food security as research to improve yields. The global trade in food is relatively small in comparison to domestic production and consumption, so improvement in the effectiveness of domestic food value-chains to deliver adequate quantities of food is important. In addition to food quantity, the importance of quality attributes, in particular food safety and sound nutrition, which contribute to overall food security, become critical elements of public policy and research investment. The Green Revolution in Asia highlights the contribution of research in improving smallholder productivity. However, research is also delivering a range of innovative outcomes throughout the value chain which are improving smallholder farmers' ability to compete in rapidly changing markets, including in the modern retail environment, while delivering on consumer expectation, reducing waste and improving efficiencies. The paper discusses some of these innovative successes throughout the value chain that improve smallholder farmer competitiveness and contribute to global food security.

The global food crisis has had significant impact on global food systems since 2007. It has been influenced by more rapid economic growth rates in the world's most populous countries, and stagnating yields of major food crops in some of the world's most productive cropping systems, with yield plateaus evident for several cereal crops in some major producing countries. As well, a rapid rise in energy prices has caused convergence of energy and agriculture.

Traditionally, economic development had its basis in land, labour and capital as factors of production. However, improved information and the development of technology through innovation have had a significant influence on economic development. This change from primary factors into information and technology has also played a significant role in the rise of value chains. Importantly, it is now the case that investment in people provides a favourable environment for innovation and knowledge diffusion.

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\* This article also appears in *Focus* 169, December 2011, published by ATSE

## **Value chains**

Traditionally, agri-food markets operate by selling non-differentiated commodities, using arms-length transactions such as auctions or pooled pricing mechanisms. Global trends in production, manufacturing and retailing have seen a shift as firms recognise the need to understand and target consumer preferences, which can be achieved more efficiently through closer coordination and integration of firms along a supply chain. This essentially has led to what is considered a value-chain approach.

This approach has become important in both research and policy fields, with an increasing number of development organisations, NGOs and governments adopting it to guide their development interventions. At the heart of value-chain analysis lies the idea that people and firms are connected along a chain that is producing and bringing goods and services to end-consumers through a complex set of activities.

Poor information flow in these complex systems, and other obstacles, often prevent farmers from entering into markets, or reduce the benefits they can obtain from entry. Value-chain initiatives are designed to overcome some of these obstacles and often to mobilise the knowledge and resources of key firms, such as retailers, to improve the opportunities and benefits of market entry for producers and providers of inputs and services.

Almost all donor-supported value-chain development projects are based on the assumption that value-chain development will help reduce poverty. The primary beneficiaries are expected to be farmers, particularly poor farmers.

It is assumed that there is underutilised potential for improving the incomes of poor producers or the employment prospects of poor people. Thus by making value chains function more effectively, for example by improving flows of knowledge and establishing linkages, it is expected that interventions will benefit the poor. However, apart from this general assumption about the connection between market engagement and poverty reduction, approaches to poverty reduction differ tremendously between interventions.

In Australia, the Government agreed to explore the possibility of enhancing productivity through analysis of agricultural value chains. The aim was to identify what industry benefits might occur, the role of government, and how a value-chain analysis could be used by government to determine allocation of scarce resources to ensure greatest benefit to industry and the broader community.

The resulting report recognised that value chains provide an opportunity for firms to have greater control over the price received. However, to maintain a premium price, producers must maintain a process of continuous innovation and differentiation based on market signals. The study concluded that there were a number of mechanisms which would influence overall value and that the role of government is primarily around facilitating this process.

## **Global food and innovation**

Global food production has historically grown faster than global population, reflecting increased availability of food per person. Between 1961 and 2008,

**Examples of innovation resulting from value-chain research**



Farmers working in rice paddies in East Timor as part of the Seeds of Life project. Photographer, Eric McGraw.



Women selling maize at a local market in Kenya



Sorting juvenile sea-cucumbers, Nha Trang, Vietnam



Feeding cattle in Lombok, Indonesia, as part of an Agricultural Systems Management project

world population grew by 117% while food production grew by 179%, with the associated real prices declining over a long period.

### **Innovation in rice production**

Ever since ACIAR was founded in the early 1980s, it has supported the research activities of the International Rice Research Institute (IRRI) — not surprisingly, given the significance of rice as a contributor to global food security, particularly in our region. An ACIAR study, which had a primary focus on understanding the impact of varietal yield improvement of IRRI's germplasm in Vietnam, the Philippines and Indonesia, showed gains averaged 11.2% across the three countries between 1985 and 2009. Economic benefits averaged \$1.46 billion per year, while IRRI's average annual budget over the time was just \$40 million.

Of course, there are many other contributions that IRRI has made, and continues to make, apart from the genetic input into the yields of new varieties. These include capacity building such as training, and non-yield impacts of IRRI germplasm such as improved eating quality, increased resistance and tolerance to pests and diseases, and contributions to overcoming other production constraints. However, the primary impact is derived through research innovation at the product level.

### **Changing preferences**

Global food requirements will continue to increase in coming years, as populations rise and as growing incomes promote both an increasing volume and a changing pattern of food consumption.

One example of a different pattern of food consumption is the higher demand for livestock products, stimulated by increasing disposable incomes. In Asia, demand growth for meat and edible oils outstripped population growth by a wide margin over the past 15 years. Demand for meat and dairy products, and therefore feed grains, is expected to continue to expand more rapidly than demand for food grain.

In addition to changing food-product preferences, around the world consumers are paying more attention to the food they eat, the value they get from it, and what it does for them and for the world around them. Food attributes that offer value to the consumer through good health, environmental stewardship, and ethical treatment of people and animals are therefore becoming more mainstream.

### **People and market innovation**

Related to this rise in consumer interest is a parallel rise in corporate interest, in part captured in Corporate Social Responsibility programs which are driving many changes in the way that food systems operate. These programs focus on the healthiness of food, the sustainability of food production, processing and transportation and the ethical treatment of supply-chain participants.

Research has found that these non-functional attributes work because they embody a value to the consumer that goes beyond satisfying hunger and

nutritional requirements, allowing consumers to vote as shoppers at a time when they are feeling increasingly divorced from the food production system.

The feeling of being divorced from a production system is counter to the feeling of vulnerability when food safety concerns drive changes in consumer behaviour. Research focused on food biosecurity becomes a key part of the innovative response due to these consumer concerns.

### **Biosecurity with chickens**

Cost-effective biosecurity for smallholder commercial poultry operations in Indonesia has been a focus of recent ACIAR research. It has used an innovative approach, with incentives to smallholders to improve practice-change in a highly complex environment. An interesting market-driven aspect of this work developed, for marketing the products: namely, the aim of a clean market chain for meat and eggs from certified biosecure farms, to be sold at premium prices in supermarkets.

Initial sales of chicken meat fetched around Rp30,000 per kilogram, while non-biosecure products were selling for about Rp12,900 per kilogram. Not all benefits flow through to the producers, who bear a significant proportion of the costs. However, significant improvements in the productivity of the biosecure farms have brought improved returns to the smallholders regardless of the financial flow of profits.

### **Sustainability in coffee**

The introduction of global sustainability standards and traceability systems to various commodity systems, including coffee, has undoubtedly led to significant restructuring of global value chains and the ways in which smallholder farmers are engaging with international markets.

Over the last 10 years, schemes such as Fairtrade, Rainforest Alliance and Utz Certified have been gradually introduced into global coffee systems and are now a common feature of the coffee industry. An oft-stated assumption behind certification schemes is that they have been put in place to deliver social, economic and environmental benefits to producer communities, thereby attracting the interest of a number of international development agencies and NGOs. However, a growing body of research has more recently begun to question the tangible benefits, for smallholder participants and broader rural environments, from being enrolled in such schemes.

While market intervention in farm practices is expected to increase further, there is currently very little impartial evidence of actual smallholder benefits and understanding of the constraints limiting smallholder engagement in such systems. Proponents of certification schemes, and industry participants in the schemes, are often aware of their limitations, and are actively seeking solutions to ensure that greater benefits flow to farmers and to the environment.

Research needs to generate insights into rural development processes associated with standards and certification, to support improved smallholder engagement in global markets and the development of appropriate policy to support this engagement. It will ascertain specific development benefits arising from value-

chain initiatives at the farm level, thus helping to inform the design of effective private-sector development interventions in the future.

### **People and trust**

The old story of the supply chain, the 'push' aspect, was all about the product. It drove lean thinking with a focus on cost minimisation and efficient logistics. The new story that has emerged shows a 'pull'-based strategy where the product is important and attributes of the product critical. Now with dynamic information flows and the need for trusted relationships, people are becoming more important in the delivery of benefits.

What the research is starting to suggest is that the relationship aspect, the aspect reliant upon people and trust, is highly important, especially among younger producers, although this important aspect may be so new.

As food systems became more complex, in the past, the supply-chain approach focused on transactions and minimisation of cost. Then value chains developed with a focus on delivering consumer requirements and improved engagement with markets. Now, there is an increasing recognition of the importance of people in this complex flow of product and information, which leads to the importance of trust.

Research shows that if policymakers wish to improve a group's emphasis on market penetration, the most important factor to develop would be group trust: there is a significant positive relationship between marketing support and group trust. Trust encourages people to work together for the common good, and this can flow through to group members working together to improve their access to the market.

### **Conclusion**

The current activities globally, following recent food security concerns, are on track, with the recognition of the importance of research and the contribution it makes to innovation in food systems. This innovation derived from research has always had a product focus, which will continue to be an important aspect of global food security.

The growth and use of value-chain approaches is another important aspect in continual improvement, with governments, donors, NGOs and the private sector recognising the role of the process, from producer to consumer. It should remain as part of the response to overcoming food security concerns.

Importantly, as information and technology are integrated into global food systems, people, the relationships between people, and trust, become increasingly important aspects and should not be overlooked in supporting innovative successes in the value chain.

### **Further reading**

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