Chapter 34
Increasing the Economic Role for Smallholder Farmers in the World Market for Horticultural Food

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Abstract Smallholder farmers will be critical to meeting the growing demand for food in the next 40 years. However, currently they face many challenges in meeting the changing demands of modern markets, including the effects of climate change, deficiencies in their enabling environment, resources, capacities and institutional models for change and development. In this chapter we set the context by defining these deficiencies and their implications for development of the smallholder horticultural sector. We present a dualistic agribusiness systems framework that helps focus analysis on the interactions in the system and the complexity of the problems. This framework helps highlight the need to develop new institutional approaches to link smallholder farmers to markets and to improve their productivity. We then review some options for linking them to markets and conclude that a range of solutions will be required, but that contract farming and traditional cooperatives will only be relevant to a limited range of contexts. We suggest that cluster marketing arrangements will be another important solution, because they are suited better to smallholder resources and capacities. They can also be used as a means to develop a horticultural innovation system that meets the needs of smallholder farmers rather than just the needs of larger enterprises.

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"Business as Usual" is not an Option

'"Business as usual" is not an option' is the striking heading at the beginning of the *World Economic and Social Survey 2011* (DESA 2011 p. v). The statement refers to the need for a transformation of the models of economic growth and development because the current paradigms will lead to the depletion of the world's resources and the pollution of the natural environment. It also acknowledges that economic progress must improve if the populations of developing countries are to have a decent standard of living. This coincides with an increasing awareness by world organisations such as the World Bank (WB), the Food and Agriculture Organization of the United Nations (FAO) and the Organisation for Economic Co-operation and Development (OECD), non-government organisations (NGOs such as OXFAM and the International Food Policy Research Institute (IFPRI)) and national governments that investment in agricultural development and innovation has not kept pace with the rising demand for food (Viatte et al. 2009; Nelson et al. 2010; OECD/FAO 2012). Underinvestment in agricultural productivity, population growth and the effects of severe climatic disturbances have caused more volatile and higher world food prices. The undernourished population worldwide had been declining from around 20 % in 1990 (Nelson et al. 2010), but this trend began to reverse at the turn of the century, with numbers increasing to over one billion following the food price spikes of 2008, 2011 and 2012 (DESA 2011). Food production will need to increase to meet the increased demand, with much of this increase to come from smallholder farmers, many of whom produce horticultural crops (DESA 2011).

To enable smallholder horticultural farmers to improve their productivity so that they can become part of the solution to the emerging food security problems, a transformation of the horticultural sector is required in developing countries that involves the whole agribusiness system and the food chains that smallholder farmers currently supply and will supply into the future. The focus of this chapter is therefore on the social, economic and environmental justifications and the approaches to including smallholder farmers in horticulture food markets, including the modern institutional markets. It begins by discussing the context for increasing the role of smallholder farmers in a discussion of constraints in the enabling environment that currently limits their ability to compete with larger farms. It outlines a framework for analysing the agribusiness system incorporating the enabling environment, the actors in the chain and other elements required to develop solutions to the complex range of issues to be addressed if smallholder farmers are to be involved in modern markets. Finally, it discusses some models for linking smallholder farmers to these markets and suggests that small cluster marketing groups will be an important solution to this issue as well as providing a means to integrate them into research, development and extension programs to meet the needs of smallholder farmers.

The Context for Increasing the Role of Smallholder Farmers

Need for Increased Food Production and Productivity

At the High-Level Expert Forum on How to Feed the World to 2050, attention was drawn to the greatest challenge humankind is facing—how to feed a growing population in the face of declining growth in agricultural productivity, climate change and a fast changing consumer demand (FAO 2009). According to FAO, by 2050, the world's population would have grown to over 9 billion, with the majority of this increase occurring in developing nations, where most of the poor live and where most of the smallholder farmers reside. Failure to meet the food requirement will lead to food insecurity with consequences for the entire world including hunger, malnutrition and conflict.

Undernourishment is a key indicator of food insecurity, with increased food insecurity for the latter part of the last decade causing rioting in some countries and resulting in changes to governments and political systems. This has the potential to become a continuing issue that will have consequences for all countries because of the projected increase in the world's population (DESA 2011). The projected increase in population, along with increased living standards in some countries, will lead to increased demand for food, requiring food production to increase by at least 60 % by 2050 (DESA 2011; OECD/FAO 2012).

While the so-called 'green revolution' of the 1960s and 1970s increased food productivity and food production, it did not lead to sustainable management of resources (DESA 2011). The increases necessary to meet the demand for food by the current world population have led to adverse environmental outcomes including land degradation, loss in biodiversity, climate change, reduction in forests, and pollution of water and marine ecosystems. The exponential increase in some of these adverse outcomes will have serious consequences if we do not adopt more sustainable production systems at the same time as we are increasing food production to meet the growing world demand (Nelson et al. 2010; DESA 2011; OECD/FAO 2012). At the same time, we face additional problems due to increased CO_2 in the atmosphere (leading to global warming and climate change), increasing prices of traditional energy sources, and little additional arable land available for development.

Climate change is leading to drying climates in some parts of the world and could be the reason for the increased volatility in world grain prices between 2007 and 2012 due to droughts in the grain belts of Russia, Ukraine, USA and Australia. In other places it is leading to increased flooding and other violent weather events. It appears that the effect of climate change is to increase the probability of extreme weather events (DESA 2011), which accentuate yield volatility and hence price volatility. Food inventories may need to be increased in many countries to provide a safety net for the poor.

Increased fossil fuel prices are a problem for the developed country production systems in particular because their key inputs such as diesel, fertiliser, pesticides

and transport are linked closely to energy prices. Many of the green revolution innovations in developing countries also relied on these inputs (DESA 2011) and they are a key component of grain and some export crop production in these countries. Increased energy prices and concerns about CO_2 emissions have led to increased demand for biofuels, which compete with food crops for land and inputs and drive up the price of food. The pricing of carbon to tackle CO_2 emissions and climate change will increase the price of fossil fuel-based inputs further and drive research and development to find alternatives.

Competition for land and water resources will also increase from alternative uses such as the growth of cities and recreational and environmental uses. While OECD/FAO (2012) predicts a slight increase in arable land used for agriculture by 2050 (less than 5%), this will be due to an increase in some developing countries offsetting a decline in developed countries. However, they also predict a decline in water availability for agriculture by 2050, with uneven distribution being a key constraint. Consequently, the required increases in food production will have to come from improvements in land and water productivity rather than from increased land area.

Despite the need for agricultural production to grow and meet demand, OECD/FAO (2012) predicted agricultural production is to slow from 2% in recent decades to 1.7% in the next decade. Consequently, the 'key issue facing global agriculture is how to increase productivity in a more sustainable way to meet the rising demand for food, feed, fuel and fibre' (OECD-FAO 2012, p. 15). While productivity has been increasing, the increases have not been consistent across regions (DESA 2011; OECD/FAO 2012), with the largest increases being in developed countries. However, there is evidence that productivity has begun to slow in developed countries and developing countries (OECD/FAO 2012), which has been partly linked to pressure on resources, but also because the easier options of improved seeds, fertilisers and other inputs have been adopted in many cases (Hazell et al. 2006). Accordingly, the largest increases in production and productivity in the next 40 years are projected to come from developing countries. This is due to a greater availability of land for agriculture and greater potential to increase productivity through reducing the gap between actual and potential crop yields and efficiencies. Therefore, farmers in developing countries will have a major role in providing the increase in food required for humankind.

Importance of Smallholder Agriculture in Meeting the Challenges

The increases in food production resulting from the 'Green Revolution' of the 1960s and 1970s and the influence of free market thinking on investment priorities, led to a level of complacency about food supplies and resulted in a decline of investments in agricultural productivity by developing country governments and international donor agencies (Oxfam 2008; FAO 2010; Heady and Fan 2010; Nelson et al. 2010; DESA 2011; Islam 2011). This also coincided with a declining importance of the agricultural sector as a proportion of GDP and in some countries expanding mineral

and manufacturing sectors that are perceived to provide a better return. However, some governments, donor agencies and international institutions have recognised that this has gone too far and it has begun to be reversed (FAO 2010; Heady and Fan 2010).

Most food (particularly fresh fruit and vegetables) is locally produced and consumed, much of it by smallholder farmers (DESA 2011). In the developing world, 3 billion people live in rural areas, of which 2 billion live on small farms (less than 2 ha) (Hazell et al. 2006). These people include half the world's undernourished people and a majority of the people living in absolute poverty. Consequently, smallholder farmers are at the heart of the food insecurity challenge (DESA 2011).

Historically, economic development has led to a migration of people from rural areas to higher paying jobs in urban areas and an increase in farm size, reducing the disparity in incomes between the rural and urban populations (Davis and Goldberg 1957; Hazell et al. 2006; DESA 2011). This development has mostly been combined with investment to improve agricultural productivity, which has been both an engine for economic growth and a major contributor to decreasing poverty. However, the scale and speed of the changes necessary to meet the rising food demand in developing countries over the next 40 years, means that these changes may not occur quickly enough (Hazell et al. 2006). Conversely, when governments have invested in improved agricultural productivity on small farms, poverty and undernourishment in rural areas have been dramatically reduced (Diao et al. 2010). In fact, investment in agriculture and particularly in staple foods leads to much greater reductions in poverty than investments in other areas (Oxfam 2008). It also leads to broad-based growth and through reducing food prices, leads to improvements in the local economies. Evidence from the Philippines is that it leads to increased local employment and spending (Rola-Rubzen et al. 2012). When this investment does not occur, the rural poor remain so and this often leads to degradation in the ecosystem (DESA 2011) and resultant political unrest. Therefore, investment in improvements to smallholder agricultural productivity is required to meet the rising food demand, but also as a driver of economic development and declining poverty levels.

Another key to improving the diet of poor people is to increase their consumption of vegetables and fruits. Much of this product is perishable and therefore has to be grown close to the point of consumption if it is to be affordable (Moustier 2012). Therefore, smallholder horticultural farmers will have an especially important role in these markets. The increasing role of global trade and the emergence of global food manufacturers, food service chains and global retailers present both an opportunity, but also a problem for smallholder farmers.

Changing Global Agrifood Industry

With economic development, significant changes become evident in food supply chains. In the first instance, greater urbanisation means a larger proportion of the population is disconnected from food production and reliant on the food distribu-

tion system. Rising incomes lead to a substantial reduction in the consumption of cereals, roots and tubers and an increased demand for meat, dairy, oil and fresh fruit and vegetables (Gehlhar and Regmi 2005). In parallel, there is a marked increase in the consumption of food away from home and with more busy lifestyles, an increasing demand for more convenient ready-to-eat foods. With the greater ownership of motor vehicles, refrigerators and microwave ovens, consumers not only shop less regularly, but they are more inclined to purchase from modern retail outlets (Shepherd 2005).

Not only is there a greater demand for a greater variety of food, but consumers are showing a greater interest in the holistic attributes of the food that they consume. Consumers want to know who produced the food, where and how. There is a growing demand for food that is more healthy, that contains less fat, less salt, less sugar, fewer additives and fewer preservatives (Batt et al. 2006). The desire for better health and greater nutritional value leads to the development of more functional foods with added vitamins, minerals and fibre. The growing awareness of the impact of food miles on greenhouse gas emissions has led to a growing desire for local food that has been produced in a more sustainable manner.

However, few producers sell directly to consumers; most sell through one or more market intermediaries. In this respect, the increasingly globalised nature of the food processing, retailing and food service sectors is having a profound effect on producers. In the first instance, the amount of fresh produce traded internationally has increased rapidly (Humphrey 2006). Not only has the composition of exports changed dramatically, there has been a marked increase in the number of alternative suppliers, intensifying the competition in the market. In parallel, in response to saturation in their home markets and new opportunities arising from economic growth, population growth and a progressive easing of the restrictions on foreign direct investment, aggregation and concentration in food processing, manufacturing, retailing and the food service sector have intensified (Batt 2006).

For these large institutional buyers, purchasing on the spot market is no longer a viable option. The inherent variability in the quantity, quality and range of products makes it impossible to adequately price the product or to engage in any generic promotion or product merchandising (Batt 2006). To overcome these impediments, food retailers, processors and manufacturers have developed alternative purchasing strategies including centralised procurement, specialised or dedicated wholesalers, preferred supplier systems and concessionaires (Shepherd 2005).

Preferred suppliers are able to offer a regular and reliable supply of a range of good quality products at a predetermined price. While quality is a physical description of the product in terms of its size, shape, colour, freedom from pests and diseases, purity (in terms of its freedom from chemical contaminants, pathogenic organisms and genetically modified plants), maturity or freshness, it also describes the manner in which the product has been packed and the way a supplier goes about delivering the product to the customer (Batt 2006). Though this means being able to deliver the product when the customer wants it, by implication it also involves many inter-related activities such as production scheduling, post harvest storage and warehousing, logistics, ordering and invoicing.

With the need to differentiate products in saturated markets, Codron et al. (2005) extends the quality concept to include the sensory attributes, health attributes, process attributes and convenience. The sensory attributes refer to the classical aspects of food quality: taste, appearance and smell. Health, as a choice criterion, is primarily about communicating both the short-term and long-term benefits arising from the consumption of various foods. The process attributes relate to the consumers interest in the processes used in food production, even though such processes may have no tangible impact on the final product. Nevertheless, greater numbers of consumers are demonstrating that they are willing to pay significant price premiums for natural or organic products, Fairtrade products (products registered as coming from smallholder producers) and those that minimise the impact on the environment. The convenience attributes are those aspects of a food product that reduce the amount of time household members typically spend on shopping, food storage, food preparation, eating and food disposal. Convenience is also associated with 'eating on the run', where consumers chose those products that can be eaten in one hand without making a mess (Martech Consulting 2005).

However, implicit in any definition of food quality is the underlying assumption that the food is safe to eat. Regrettably, with the increasing reliance on convenience foods, the greater consumption of food away from home, the increased volume of trade in fresh and processed food products, and the increasing desire for fresh and natural food products, there has been a marked increase in the number of food safety incidents (Kaferstein 2003). For fresh produce, the major health concerns appear to relate to the presence of chemical residues (Shepherd and Galvez 2007). With limited knowledge, illiteracy, inappropriate labelling and persuasive sales representatives, the overuse of chemicals is frequent among smallholder farmers (Ketelaar 2007). Many smallholder farmers apply pesticides too often, at rates often much greater than label recommendations and too close to harvest (Shepherd and Tam 2008). Other farmers apply chemicals immediately prior to harvest to improve the physical appearance (Davies et al. 2006; Shepherd and Tam 2008).

More recently, the microbiological contamination of fresh produce has become a major issue, with some of the most recent and serious food safety incidents involving spinach in the US and organic bean sprouts in Germany. Biological contamination may arise from the irrigation or washing of fresh produce in water contaminated by both human and animal waste, poor personal hygiene and the frequent use of poorly composted animal manures (Shepherd and Tam 2008). In some instances, the reuse of fertiliser bags or bags used for the transport of animal manures is a common practice.

In order to protect both consumers and the integrity of their brands, most retailers and food manufacturers have implemented one or more quality assurance programs to identify those critical steps in the chain that are most likely to lead to contamination. Rather than rely on end-point inspection, the preferred strategy for minimising the risk of contamination is the Hazard Analysis Critical Control Point methodology (HACCP), which focuses on prevention (Baines et al. 2006).

In addition to requiring suppliers to meet food safety standards, several global retailers and food manufacturers have also specified product quality criteria. Not

only does this enable buyers to specify how products should be grown, harvested, transported, processed, packaged and stored, it has provided them with the power to impose their requirements on other actors in the value chain and to reward compliance (Humphrey 2006). The majority of these standards are based on Good Agricultural Practices (GAP), which not only provide an assurance of food safety, but also focus greater attention on the adoption of sustainable farming practices. These endeavour to ensure that farmers are adopting and following prescribed crop rotations, minimising the application of fertilisers, pesticides and herbicides to reduce environmental contamination, protect ecological diversity and minimising the eutrophication and pollution of waterways from excessive run-off. Good practices extend to the appropriate use of chemical storage facilities and protective equipment to protect against accidental poisoning, occupational health and safety, and animal welfare (Akkaya et al. 2006).

Recent shifts in the regulatory environment have exacerbated the widely held view that smallholder farmers may be marginalised—if not excluded completely—from participating in modern supply chains (Humphrey 2006). Many buyers believe that smallholder farmers, even when they are organised into collaborative marketing groups, are unable to supply a sufficient quantity of good quality product. Even with appropriate training, as the farmers effectively pool their produce, the risk of non-conformance to prescribed standards is multiplied greatly, thereby demanding more frequent monitoring and inspection. Furthermore, the majority of smallholder farmers are unable to comply with many of the requirements such as concrete floors, foot operated hand basins, or to provide a reliable source of potable water (Shepherd 2005).

Constraints in the Enabling Environment for Smallholder Agriculture

De Oliveira (2007, p. 57) defined the enabling environment as ‘all the factors that are external to the agribusiness itself but which affect the way businesses operate and impinge on the development of the private sector’. This is based on the context that the government should lay out policies that are conducive for the business of the private sector. Rottger and Da Silva (2007, p. 5) identified that the factors for creating an enabling environment included ‘macroeconomic and political stability, efficient land markets and tenure systems, consistent open trade policies, rural and agricultural financial service delivery, availability of human resources, well-functioning public-private partnerships (PPP), good governance, and the availability of improved technologies’. Conditions in the enabling environment were categorised by Christy et al. (2009) as including essential, important and useful enablers. Essential enablers include land tenure and property rights, infrastructure and trade policies. Important enablers are financial services, standards and regulations, and research, development and extension services. Useful enablers include business development services, business linkages and ease-of-doing business. In the Philip-

pines, impediments to investments in agriculture are summarised by Habito and Briones (2005) as including access to public and private land, inadequate infrastructure, poor local governance, limited access to long-term finance, limited access to technology, limited access to raw materials, lack of global market access, unstable peace and order, widespread corruption and weak enforcement of contracts.

Land Tenure and Policy

Land is a necessary resource in agriculture production and a limiting factor, because only so much can be grown on a given area. In the Philippines, average land sizes of farms were reduced to 2 ha in 2002 from an average of 3.2 ha in the 1960s (Canlas et al. 2011). The reason given for this reduction in average farm size is that land is divided among children for their inheritance.

Aside from the reduction of farm sizes, there is also the threat of competition for agricultural land from foreign companies (Polack 2012). Foreign companies in biofuel production and plantation crops such as bananas are investing in land. There is also the conversion of land use from agricultural to industrial, residential and commercial (Kelly 2003). Agricultural land located in the periphery of urban areas is converted to other uses as population increases and urban areas expand. Both of these concerns occur because of weak policies (Kelly 2003; Polack 2012).

The agrarian reform program in the Philippines aimed to provide access for landless farmers to land resources. It was able to provide positive impacts to beneficiaries with evidence of higher income and reduced poverty incidence (Reyes 2002). Access to land can be of equal importance to ownership when it comes to land concerns. Marginalised farmers have lesser land to cultivate which limits their productivity. However, if access to land is granted through institutional mechanisms such as policies that provide disincentives for idle lands, then smallholder producers can be granted opportunities to expand their production (Smit and Nasr 1992).

Access to land for crop production does not necessarily require providing ownership to smallholder producers. Rather, what is necessary is that there are policies and tenure instruments that provide access and security in the use of land. It is a matter of implementing policies and creating innovative solutions to provide smallholder producers access to a necessary resource. It is also necessary for the government to set priorities for the allocation of land between uses and users.

Infrastructure

National government projects such as the Strong Republic Nautical Highway (SRNH) in the Philippines provided benefits to agricultural producers by reducing transportation costs by as much as 33 %, and providing access to new markets (Basilio 2008). Teruel and Kuroda (2005) concluded that the reduced investment in infrastructure is one of the causes of the decrease in the productivity of agriculture in the Philippines. The presence of national level infrastructure that connects

communities helps in utilising comparative advantages in agricultural/horticultural production, which can enhance efficiency in the use of national resources. This can also create better access to commodities for consumers.

Communication facilities improve coordination among smallholder producers. It is also used in expanding the coverage of extension services (Olchondra 2010). Communication services are limited in that these are usually owned by the private sector and investments are made where it will be most profitable. Schrekenberg and Mitchell (2011) suggested that governments can provide policies and incentives to the private sector to expand coverage of communications services. Public-Private Partnerships (PPP) is an avenue that can be used in improving infrastructure facilities in rural areas, but requires projects to be profitable (Warner et al. 2008). In this regard, delivering conditions that will assist smallholder producers should also involve providing conditions to the private sector that can assist smallholder producers.

Research, Development and Extension

Research, development and extension remain important to smallholder producers because of changing consumer demands, changing structures and climate change. Smallholder producers need to be able to adapt to consumer demands with respect to variety. Increasing demand will also mean that productivity must be enhanced. As agricultural productivity has plateaued, it is critical that research and extension continue to spur growth in the agricultural sector (FAO 2009). According to Beintema and Elliott (2009), declining rate of growth in agricultural/horticultural R&D investment has been associated with a decline in the growth of agricultural/horticultural productivity, which has been statistically linked to the change in the composition of research away from productivity-enhancement at the farm or grower level.

Of equal importance are extension services that bring research outputs to rural communities. In the Philippines, weaknesses in the extension services can be traced to the decentralisation of agriculture services from the national to the local level (Prantilla 2011). Prantilla (2011) found that the performance of agriculture extension services is dependent on the support given to agriculture by the local chief executive. Coordination between the levels of government was reduced because decentralisation gave local governments autonomy in deciding priorities and developing and implementing agriculture programs.

Financial Services

Interest rates given to larger firms by financial institutions are 7% per annum while smaller firms are charged 10-12% per annum (Canlas et al. 2011). However, the higher interest rates can be explained by higher risks and the operational expenses involved when dealing with smallholder producers (Armendariz and Morduch 2010). Microfinance institutions (MFIs) are committed to serving their clients by

ensuring that they are able to reach them even with high operational costs (Mendoza and Vick 2010).

Microfinance in the Philippines has been deregulated, giving MFIs the freedom to develop their own strategies (Quinones and Seibel 2000). MFIs tend to favour clients who have better capacity to repay their loans, which results in mission drift (Aubert et al. 2009). Mission drift can put smallholder producers at a further disadvantage due to limited access to financial services.

High interest rates charged by MFIs to smallholder producers is a constraint that cannot be solved easily because this is tied to operational effectiveness of firms. Without higher interest rates, the viability of the operations of MFIs can be compromised, leaving smallholder producers with less access to financial services.

Business Development Services

As farming enters the century of globalisation, smallholder farming increasingly has to operate in a complex business environment. Unfortunately farmers are often ill-equipped to deal with players in the modern chain, and access to business development services can facilitate their participation in modern markets.

Business services are delivered by public sector providers, private providers, NGO providers and cooperatives or membership-based organisations (Kahan 2007). Business development services can be a function performed by non-government organisations that operate on a specific timeframe and project budget. Upon the completion of the project, business development services can cease to exist except if they build in sustainability of operations. UMFI adopted a model whereby they provide paid services to the communities they serve. This means that they can generate funds to sustain their operations.

The Pecuaria Development Cooperative Incorporated (PDCI) was supported by the Upland Marketing Foundation Incorporated (UMFI) (Concepcion et al. 2011) to find the right marketing channel for their organic rice. Services also included developing the brand of the organic rice including labelling and development of packaging. It was able to provide higher income for smallholder producers as it realised the potential value of organic rice.

Issues at Different Levels

Constraints in the enabling environment emerge at the national, meso and micro levels, although most of the constraints may emanate from national level decisions because of conflicting policies. For example, the decentralisation of agricultural services in the Philippines was designed to enhance the provision of services based on the rationale that it is the local government that knows the local situation better, and thus it is in the best position to provide services. The policy inadvertently weakened agricultural services because not all local government units had supportive local chief executives.

Institutions at the micro level are in a better position to provide favourable conditions to smallholder producers primarily because they have greater control of the situation, and macro level influences are also beyond their control (Bryant 1989). Even though there are macro-environment factors that are exerted at the micro level, institutions and stakeholders at the local level can make the necessary adjustments.

Smallholder producers find it difficult to comply with modern market requirements in terms of quality, variety, volume and consistency. However, research by the Regoverning Markets Programme found that modern markets do not necessarily exclude smallholder producers (Vorley 2011). Examples in the Philippines like PDCI and NorminVeggies show how smallholder producers are able to supply supermarkets and institutional buyers with the help of non-government organisations (Concepcion et al. 2007a, b).

Pinstrup-Andersen and Watson (2011) found that the role of the government in food policy passed through several phases. These phases included leaving markets alone, followed by heavy interventions, then the "government as a problem" phase, and "getting the institutions right". Heavy interventions resulted in governments creating more problems rather than setting things right. The recognition that harm has been done by heavy government interventions needs to be corrected by getting the institutions right. This highlights the recognition of the importance that public-private partnerships can contribute in promoting inclusive growth.

The fourth phase of getting institutions right recognises that each stakeholder has its role to fulfil in the agribusiness system. Addressing constraints in the enabling environment involves participation from different stakeholders of the agribusiness system. It is also acknowledged that these stakeholders have their own objectives to meet, and implies that compromises should be made. The role of the government is to support policies that will allow the private sector to support the inclusion of smallholder producers.

Summary of the Context for Increasing the Role of Smallholder Farmers

In this section, we have shown that the world has serious and complex problems to address if it is to continue to feed its growing population, while maintaining a liveable quality environment. The 'success' of the 'Green Revolution', which resulted in lower food prices and declines in the proportion of the world's population who were undernourished led to complacency about food security and underinvestment in agricultural research and development. The recent food price spikes have led to increased focus on food insecurity in recognition of the rapidly increasing population, combined with rising energy prices, global warming and climate change, and depleting natural resources. Because of their intimate involvement with the production of food and the large numbers of farm households living impoverished and undernourished lives, they will need to be actively involved in meeting these challenges. Apart from their obvious lack of human and produced economic capital,

they face additional issues in increasing their productivity including difficulties in accessing the expanding value chains, which in turn are constrained by deficiencies in their enabling environment. Nevertheless, solutions to these challenges are required, so the rest of this chapter will outline some ideas about how smallholders can become part of the solution rather than part of the problem.

A Framework for Undertaking a 'Sustainable Agribusiness Transformation' in the Horticulture Sector of Developing Economies

Because 'Business as usual' is not an option, we must craft new ways to address the complex issues involved in developing innovative smallholder farming systems able to adapt fast enough to meet food production targets. We argue that a 'Sustainable Agribusiness Transformation' is required rather than simply another 'Green Revolution' to meet the economic, social and environmental requirements for future generations. This section outlines a framework for this to occur. This requires a holistic approach to analyse and understand the issues involved.

Defining the Elements of an Agribusiness System

John Davis (1955) was the first to publicly use the term agribusiness in a presentation to the Boston Conference on Distribution in 1955. In 1957 Davis and Goldberg (1957, p. 2) defined agribusiness as:

> the sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farm; and the storage, processing, and distribution of farm commodities and items made from them.

In other words, agribusiness is the set of interacting organisations that jointly provide food and fibre products for consumers. It includes all organisations that produce process or distribute food and fibre products and those organisations that provide inputs to those organisations. Davis and Goldberg (1957, p. 74) went on to say 'the problems of commercial agriculture … need to be approached as agribusiness issues because both their cause and their solution encompass the off-farm functions of supply manufacturing and processing-distribution as well as on-farm production. *The point is that the approach to solutions must be as comprehensive as is the bases of the problems themselves*' (original italics). Essentially, they were arguing that the food system needs to be treated as a holistic holistic system and that attempts to address problems in the food system will fail if they attempted to address only portions or segments of the system.

Their arguments can be extended by drawing on general systems theory to consider the food system as an open system—an open agribusiness system. General

systems theory stresses the need to understand the system as a whole and the arrangements of the components and relationships in the system (von Bertalanffy 1968; Checkland 1981; Kaine and Cowan 2011). Open systems interact with their environment, and the state of the environment influences its behaviour and changes in the state of the environment will change the behaviour of the system.

An agribusiness system can therefore be considered as those organisations that produce, process and deliver food and fibre products to consumers and it exists within a socio-economic and political or enabling environment that provides a framework of institutions and norms and values that define and constrain the operations of the system (Murray-Prior and Ncukana 2000). Such a representation is consistent with the call in DESA (2011, p. 83) that 'all actors, institutions and processes, within the whole food chain must be part of the policy innovation framework'.

For example, the vegetable agribusiness system for smallholder farmers in Mindanao in the southern Philippines can be represented as a supply chain with its associated components and actors and the associated environmental suprasystem (Fig. 34.1). In this diagram the systems boundary is defined for the actors and functions for a particular industry, although, it is possible to consider a broader system, incorporating all elements of the food system within a country (Murray-Prior et al. 2004). The suprasystem consists of the socio-cultural and political environment (which incorporates the enabling environment) and the agro-climatic-ecological environment (which incorporates the natural capital and effects of environmental changes). The issues affecting the suprasystem have been discussed in the global context in the previous section. Traditionally, smallholder vegetable farmers in Mindanao supply the wet markets through a system of traders that deliver variable quality product to the poorer consumer segments. The product passes through many hands and its quality is affected by the inefficient and substandard production, packaging, handling, logistic and marketing systems. While the markets are generally competitive (although not always for farmers), relationships are often adversarial. Information flows from the market back along the chain are mostly non-existent and most elements of the chain have a poor understanding of market requirements and demand. Consequently there is no mechanism in the traditional system for smallholder farmers to receive a higher price if they produce a premium product. In fact they have little understanding of the market requirements outside their immediate locations.

The model in Fig. 34.1 also shows products being delivered to supermarkets. While much of the vegetable product in supermarkets in the Philippines comes from traditional supply chains, mostly from wholesalers in the wet markets, increasing amounts of product are being supplied by sophisticated value chains, either sourced from large corporate farms or imported from overseas. The quality of much of this product meets the requirements of value chains for reliable, consistent quality that incorporates food quality, safety and traceability systems. Conceptually, these chains can be considered as a dual system to the traditional system.

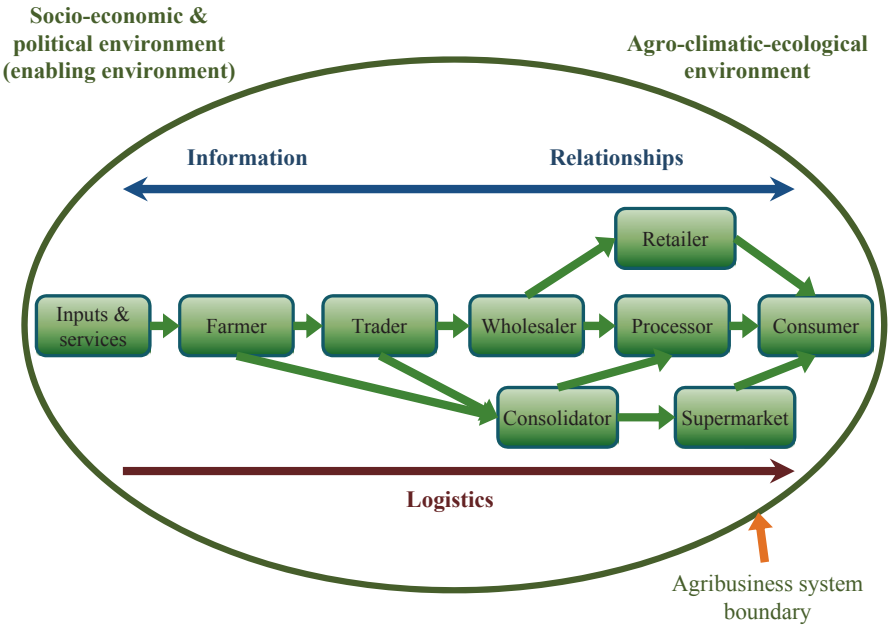

Fig. 34.1 Simple representation of the agribusiness system for smallholder vegetable farmers in Mindanao, southern Philippines. (Adapted from Murray-Prior et al. 2004)

A Model to Analyse the Dual Agribusiness Systems for Horticultural Industries in Many Developing Economies

The model of a dual agribusiness system was developed by Murray-Prior and Ncukana (2000) in order to conceptualise the issues facing agricultural development in South Africa. It provides a framework to analyse some of the issues that arise in attempting to outline a way forward for people in the 'resource poor' chains that supply traditional markets. Theoretical models of dual economies began with Lewis (1954) and were based around the ideas of two sectors in the economy, one an 'advanced' capitalist sector and the other a 'backward' predominantly rural sector. Singer (1970) outlines four key elements of dualistic economies:

1. The dual systems exist in a given space or country. The coexistence of these systems is often based on a dependency relationship.
2. Coexistence is persistent and will not necessarily disappear over time.
3. There may even be a tendency for the discrepancies between the two systems to increase rather than decrease.
4. There is no 'trickle' down effect from the 'advanced' sector to the 'backward' sector, in that the former does not pull up the latter and may even keep it down.

In many postcolonial, developing countries a 'resource rich' agribusiness sector coexists with a 'resource poor' agribusiness sector, with the former drawing on la-

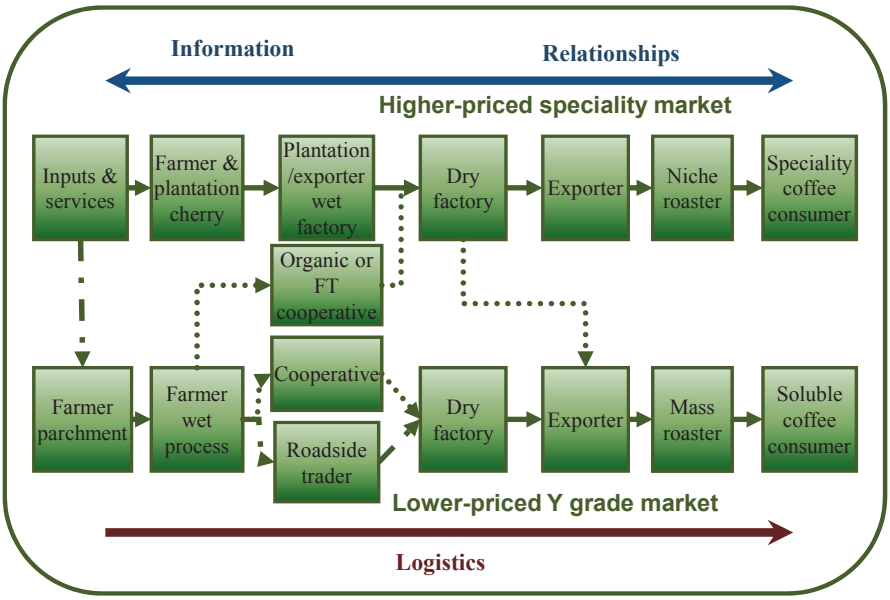

Fig. 34.2 Model of the dualistic agribusiness system for Arabica coffee in Papua New Guinea. (Adapted from: Murray-Prior et al. 2008)

bour and some product from the latter, but providing little of value to it. In fact the existence of a highly developed, 'resource rich' agribusiness sector with its economies of size, complex systems of management and high standards of quality control make the markets they supply extremely difficult for 'resource poor' chains to penetrate. The latter are also at a disadvantage when competing for resources, whether the resources are physical, financial or human.

A dualistic agribusiness system can therefore be characterized as having two types of chains: a 'resource-rich' value chain that supplies high quality product to a higher priced market and a 'resource-poor' supply chain that supplies poorer quality product to a lower priced market. A good example of this can be found in Papua New Guinea's Arabica coffee industry in the highlands (Fig. 34.2). It has a plantation-based sector that produces Arabica green bean that is mostly sold to the speciality coffee markets and ends up in coffee houses such as Starbucks (Murray-Prior and Batt 2007). In this chain coffee cherry is processed in large wet factories that are run commercially and have exacting quality control standards. Green bean from these chains is sold at a premium to the Other Mild Arabicas contract on the New York ICE Futures market. On the other hand, green bean from the smallholder sector is sold to coffee roasters and is blended to produce soluble instant coffee. Smallholder coffee cherry is processed using village smallholder processing techniques that lead to variable quality and other defects in taste and presentation. Consequently it is sold at a discount to the Other Mild Arabicas contract. However, smallholder coffee cherry when processed through commercial wet factories (as is shown in Fig. 34.2)

is sold to the speciality market. The use of such models provides a framework for analysing and finding solutions to the problems faced by smallholder farmers in these dualistic chains (e.g. Murray Prior et al. 2006, 2008). These solutions involve changes to the system and also to the enabling environment.

More broadly a dualistic agribusiness systems model has been incorporated within a pluralistic research framework, based on Checkland's soft systems methodology, to conduct research and development with agribusiness supply chains (Murray-Prior et al. 2004, 2007a). It enabled the research teams to identify which issues needed to be researched, what methodologies were appropriate for that research and to integrate research conducted by a multidisciplinary team of researchers.

Summary of a Transformation Framework

In this section we have expanded the concept of agribusiness first expounded by Davis (1955) and Davis and Goldberg (1957) into a dualistic agribusiness systems framework that helps an analyst take a holistic view of the policy and research challenges facing the development of horticultural industries in the developing world. It also helps identify the components and the relationships critical to the functioning of a horticultural system, particularly those along smallholder supply and value chains and the constraints in the enabling environment that limit its ability to adapt and respond to the challenges it faces. This requires a focus along the value chains. One of the key issues identified in the context section and through the use of the agribusiness systems framework is the need to find ways to integrate smallholder farmers from developing countries into the changing modern markets. By doing so they will be able to help meet the increasing demand for food as well as improve their incomes to help move them out of poverty which the DESA report suggests is required.

Some Models for Linking Smallholder Farmers to Modern Markets

The small volume produced by smallholder farmers as individuals means that an arrangement is required whereby their product can be consolidated to achieve the volumes required by modern retail markets. There has been a range of reviews of models for involving smallholder farmers in value chains (Batt 2007; Singh 2007; Vorley et al. 2009; Vermeulen and Cotula 2010; Moustier 2012). These models can be conceived as following two broad approaches: 'top down' approaches that involve a company structuring its arrangements with smallholder farmers in order to capture value and 'bottom up' approaches that involve smallholder farmers organising themselves in order to supply institutional markets. Of course, these are the two ends of the spectrum and there are examples of partnership models in the middle of the spectrum. There is insufficient space in this chapter to undertake a

detailed examination of all the models, so our approach is to define the elements of the different approaches briefly while focussing on the 'bottom up' and partnership approaches.

'Top Down' or Buyer Driven Models

Two drivers in modern value chains have led to the interest in buyer driven models that involve smallholder farmers. These are the move by supermarkets to source from preferred suppliers rather than wholesale markets (Vorley et al. 2009) and the large-scale acquisition of land by investors to supply institutional value chains (Vermeulen and Cotula 2010). Partly because of backlashes to some of these changes, but also because of the recognition that they are leading to the marginalisation of smallholder farmers and the concerns of some consumers about social and environmental issues, some businesses have begun to develop models for dealing with smallholder farmers.

Buyer driven models are normally organised through contracts between retailers or processors and farmers and are commonly known as contract farming arrangements. It is a form of vertical integration in which retailers or processors try to gain a competitive advantage over their competitors through creating efficiencies in the chain or improved product quality. They do this by establishing greater control over production processes and therefore improving reliability, consistency and quality of the final product (Vorley et al. 2009; Prowse 2012). It can also enable them to implement quality assurance procedures, which has risk management advantages. While other models are possible, such as management and lease contracts and joint ventures, these are not necessarily associated with linking smallholder farmers to market and are not considered in this discussion.

Contract farming arrangements involve advance contracts between farmers to deliver a specified quantity and quality of a product to a buyer at a specified time, place and price (Singh 2007; Vermeulen and Cotula 2010). Singh (2007) divides the contracts into three main types: procurement or marketing contracts, which are only about obtaining access to the product from the farmer; partial contracts, which involve a marketing contract and the provision of some inputs to the farmer; and a total contract, which involve a marketing contract and the provision of all the inputs and the management systems, with the farmer mainly supplying the land, labour and day-to-day monitoring services. Variations of contract farming include: a centralised model, involving contracts between a firm and a large number of independent farmers; a nucleus-estate model, involving a plantation that obtains extra product from independent farmers; a tripartite model, involving a joint venture of a public entity and private firm that contracts with farmers; an informal model, involving smaller firms organising annual agreements with a limited number of farmers; and an intermediary models, involving a firm sub-contracting to an intermediary who obtains product from farmers (Singh 2007; Prowse 2012). The types of contract for these variations will differ depending on the structure of the model.

Contract farming can have benefits for farmers including: access to markets, improvements in financial approval, improved prices, technical assistance, specialised inputs and new technologies; reduced price variation and risk; all of which can increase income and help with rural development (Key and Runsten 1999; Singh 2007; Prowse 2012). It can also be an alternative to corporate farming that makes smallholder farming competitive, while allowing firms to have improved product quality and lowering transaction costs for firms as well as farmers. However, many contract farming arrangements favour larger farmers, particularly in dualistic agrarian economies, which can exclude smallholder farmers and exacerbate income and asset inequalities. The total contract arrangements can lead to a loss of control with farmers becoming 'serfs with two-way radios' (Singh 2007) and be patchy in capacity building, with the emphasis being on technical competency rather than managerial competency (Vorley et al. 2009). Other disadvantages of contract farming include the loss of flexibility in choosing crops or enterprises, increased market power of agribusiness firms and in some cases, manipulation of quotas such that not all farm production is purchased by the company leaving farmers to shoulder production losses (Sofranko et al. 2000; Eaton and Shepherd 2001; Singh 2007). On the other side of the coin, there have been studies showing that some farmers do not honour the contracts either deliberately or due to misinterpretation or differences in interpretation of the contract (Glover and Kusterer 1990). If a firm has market power as a monopsony buyer (the only buyer), it can influence markets. They can demand exclusivity of supply or reduce the availability of market signals from spot markets, which reduce the ability of farmers to determine realistic prices for their product (Singh 2007; Vorley et al. 2009).

The success or otherwise of various contract farming initiatives seems to be highly dependent on context, including such issues as culture, policy, land tenure systems, asymmetry of information, differential access to information, differences in negotiating power and other characteristics of the enabling environment (Singh 2007; Vermeulen and Cotula 2010; Prowse 2012). These issues have implications for the design and implementation of buyer-driven models for linking smallholder farmers to modern markets. Most contract farming models struggle in a competitive environment, particularly where there are economies of scale, unless they have a comparative advantage. Prowse (2012) reviewed 44 cases and concluded that economies of scale, variations in quality, perishability and price per kilogram were linked to success of models. Some fruits, vegetables and tree crops were suited to contract farming, but Singh (2007) suggests that in some cases these schemes may wither when the reasons for their comparative advantage are removed.

Vermeulen and Cotula (2010) suggest a common set of principles that sum to '*systemic competiveness*', based on collective efficiencies rather than individual actor efficiencies are apparent in successful models. This means that the business must focus on a new approach to corporate social responsibility that incorporates an inclusive model and facilitates collaborative problem solving rather than on supplier codes and compliance. The key is to build a chain model 'that balances risk, responsibilities and benefits along the chain while not undermining competiveness' (p. 217).

'Bottom Up' or Farmer-Driven Collaborative Marketing Models

Farmer-driven models for linking farmers to markets have a long history and are normally associated with cooperative models. Cooperatives have provided farmers access to inputs, access to credits, encouraged sharing off agricultural knowledge, fostered new technologies and innovations, facilitated transport, storage and processing and linked farmers to markets (Trewin 2004; Bacon 2005; FFTC 2006; Bakucs et al. 2007; Bernard and Spielman 2009). Often farmers form groups to increase their bargaining power, pursue a common enterprise or interest including accessing government or other external programs that require group membership (Trewin 2004).

We prefer to use the term collaborative marketing models or collaborative marketing groups (CMGs) as an all-encompassing term to describe 'a group of farmers who have organised to collectively market their produce' (Murray-Prior 2007b, p. 2). This definition includes structures such as cooperatives, growers associations, cluster marketing groups and bargaining cooperatives. Historically farmers have formed cooperatives for three main reasons: increasing bargaining power (often with processors), in response to government programs and policies, and to take advantage of entrepreneurial opportunities.

The outcomes from cooperatives and CMGs organised by or for smallholder farmers in developing countries have been mixed, with many examples of their failure (Lele 1981; Murray-Prior 2007b; Vorley et al. 2009). Most of the literature on the deficiencies of traditional cooperative forms have been for developed countries (e.g. Cook and Chaddad 2004; Nilsson et al. 2012), but there is a growing literature (Chibanda et al. 2009; Batt and Murray-Prior 2011; Thomas and Hangula 2011) assessing CMG models that are appropriate for developing countries, which will be the focus of this section. Although Reardon and Huang (2008) found membership of producer organisations was correlated with participation in modern markets for 4 out of 8 developing countries, we believe smallholder CMGs will be a key part of the solution to meeting the increasing demand for food over the next 40 years and in coping with changes in the agribusiness sector and in the climate. The key will be finding contexts and models that are suited to improving smallholder access and profitability.

However, if CMGs are to be successful, they must have a comparative advantage over alternative marketing structures, within the environment of smallholder farmers in developing countries, and they must be able to deal with the issues of trust and member commitment (Murray-Prior 2007b). As with contract farming, there are many structures and models for cooperatives and CMGs, but in this section we will briefly discuss two forms: cooperatives, mainly linked to Fair Trade and organic markets and cluster marketing groups (Cluster MGs).

Cooperatives

Most successful supply or marketing cooperatives have been in a few developed countries and many have been associated with processing activities. However, in developing countries the chances of success for these types of cooperatives if they

are managed by smallholder farmers are more problematic. For a start, they have to compete with internationally competitive processing companies because of the more globalised environment for most agricultural products. This means it is very difficult for them to achieve the economies of size, raise the capital to build the plants and to acquire the management expertise to run the operations (Murray-Prior et al. 2009). Without substantial and long-term outside assistance, their chances of setting up and succeeding are very small.

If a marketing cooperative is to have a comparative advantage for smallholder farmers in a competitive environment, then it has to find a market where this form of organisation has an advantage. Fairtrade (FT) and to a lesser extent organic markets can be niche markets for smallholder farmers in some countries and in some industries. FT is most prevalent for non-perishable products such as coffee, cocoa, cotton and rice (Fairtrade International 2012). While some fresh fruits are sold under the label, they have a relatively limited market penetration, so to a certain extent this option is only available for a limited number of farmers. Because FT consumers are in developed countries, smallholder producers in developing countries who produce perishable horticultural fruits and vegetables are mostly excluded by virtue of the distance, transport, packaging standards and associated constraints.

Particularly in the coffee industry, smallholder farmers can obtain organic and FT certifications that enable them to access these markets and potentially gain an advantage over large and corporate farms, which cannot obtain FT certification. Evidence of smallholder gains from participating in these markets is mixed. Becchetti et al. (2011) found participation in FT and organic certifications through cooperatives increased per capita income for rice farmers in Thailand. Two studies of FT-organic coffee production in Nicaragua suggest a slightly different picture, with Valkila (2009) finding that participation increased income for low intensity farmers but that this type of farming did not produce much coffee or income so that the farmers remained in poverty. However, Beuchelt and Zeller (2012) found no clear income affect and suggest that the business model of a cooperative was a more important factor in their success. In Tanzania, the benefits of involvement in FT cooperatives appear to be less than they are in Nicaragua, which is attributed to the large size of the Tanzanian cooperatives leading to a lack of member commitment to producing quality coffee (Pirotte et al. 2006).

One of the key problems for FT and organic certification is the requirement to have a functioning cooperative and to be able to meet the FT certification standards (Batt and Murray-Prior 2011). Considerable time and effort is required to establish and maintain such groups and this relies either on the smallholder farmers having the necessary human and social capital to achieve this or a private company or non government organisation (NGO) to provide the expertise and support. If a private company provides the necessary expertise and support and markets the farmers' product, it then has to overcome perceptions that it is acting fairly (Murray-Prior et al. 2009). This requires a mechanism or structure to maintain trust between farmers and management. One mechanism to achieve this is the involvement of third parties to act as arbiters and referees (Murray-Prior et al. 2009; Moustier 2012; Prowse 2012). The other issue is the time required to obtain organic and to a lesser

extent FT certification, during which premiums are not available, but costs need to be borne to undertake the certification process. Therefore, while FT-organic markets are an option, they appear to provide limited opportunities for many smallholder horticultural farmers in developing countries.

Cluster Marketing Groups

Because of the abundant evidence that collaborative marketing groups of smallholder farmers in developing countries are often not competitive in institutional markets, or even when competing with intermediaries in traditional markets (Murray-Prior 2008), models of collaboration are required that enable smallholder horticultural producers to be competitive in institutional markets and to be sustainable. One such approach that has shown promise is the clustering approach developed by the International Center for Tropical Agriculture (CIAT) and adapted by the Catholic Relief Services in the Philippines (CRS). CIAT developed the *Territorial Approach to Rural Agro-enterprise Development* (Lundy et al. 2005) as a guide for service providers to facilitate collective marketing by smallholder producers and to strengthen the capacity for them and their chains to compete in their selected markets. CRS-Philippines (2007) have since adapted this process to organise 'small farmers into marketing clusters to enable them to equitably participate in the opportunities of evolving dynamic markets' (p. xv).

The CRS Clustering Approach to Agro-enterprise Development is referred to as the Eight Step Clustering Approach (CRS-Philippines 2007) (Fig. 34.3). In Step 1, the site is selected and partnerships are built with farmers and other stakeholders. Step 2 involves a process in which members of the farmer group identify the community's resources, products and production and marketing practices and decide what product or products they will focus on. In Step 3, farmers are trained to undertake a market chain study involving market visits to develop their understanding of the chains for their selected products. They also negotiate preliminary trading terms with potential buyers.

Step 4 involves formation of the cluster, selection of the leaders and agreement on a basic cluster arrangement and objectives. Normally, the number of farmers in a cluster ranges from 5 to 15, with most clusters kept below 20 in an attempt to ensure effective communication and maintain a trusting environment. In Step 5, a planting and harvest calendar for the products of the cluster and a test marketing plan are developed. The test marketing activities (Step 6) involve at least four trial product deliveries. After each delivery, the cluster assesses performance and adjusts the plans to improve performance. When the cluster and facilitators judge the test marketing activities to be successful they appraise the readiness of the cluster for scaling up and begin planning and conducting a scaling up process (Step 7). This involves producing more or additional products to supply existing or more diversified markets. Step 8 (cluster strengthening) comprises improving cluster maturity through expanding cluster capacity and networks with other clusters and businesses.

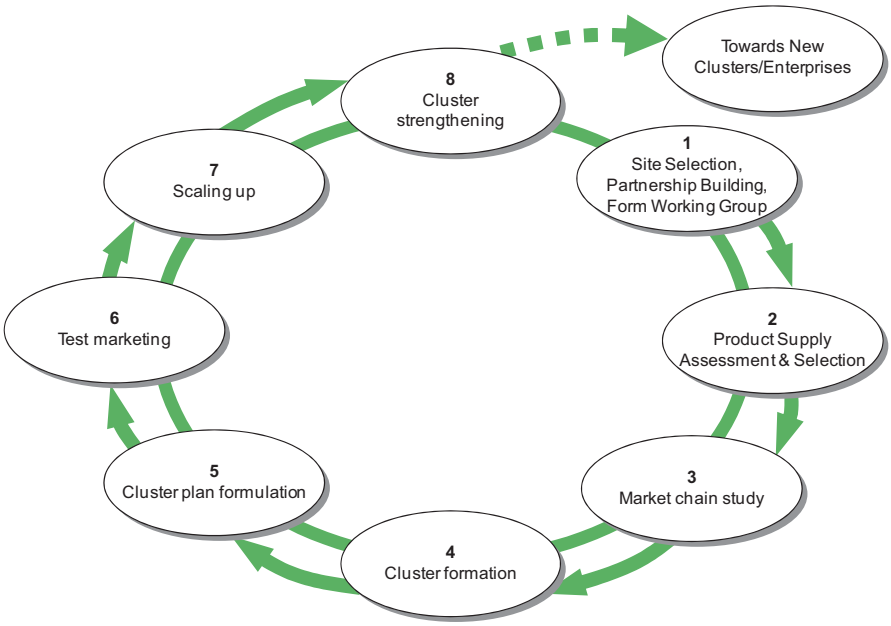

Fig. 34.3 Eight-step process of the clustering approach to agro-enterprise development. (Source: CRS-Philippines 2007)

This clustering process was evaluated as part of an Australian Centre for International Agricultural Research project in Mindanao, southern Philippines that facilitated the establishment and development of 29 clusters that marketed vegetables and involved about 360 farmers (Rola-Rubzen et al. 2012). It found that clustering had a positive economic impact and increased the household income of cluster members over non-cluster members through increasing the range of vegetables produced and the volumes and prices of most vegetables. The process improved the production and marketing capacity of cluster members and in particular improved their negotiating skills, bargaining power, access to government, NGO and private sector services, and the quality and yields of their products.

These findings are consistent with Vorley et al. (2009) who analysed a range of business models and concluded that producer organisations can lead to improved negotiating skills and access to services. Furthermore, Moustier (2012) suggests they lead to reductions in transaction costs associated with training and quality inspections, two issues that are the focus of the clustering process. The size of the clusters also helps overcome the issues of trust and member commitment required to sustain successful CMGs (Murray-Prior 2007b). Clusters have a comparative advantage because they can combine products to achieve more marketable volumes, sort for quality, and improve packaging and transport that together enable access to higher priced markets.

Despite these successes, Murray-Prior et al. (2012) suggested the CRS Eight Step Clustering Approach should be adapted to incorporate processes to reduce some of the problems such as: input financing; risk of production failure; maintaining relationships with buyers; and building group resilience and independence. They also suggested the need for a formal exit strategy for the donor agencies. They suggested a Three-phase Clustering Framework incorporating: Phase 1—Establishment; Phase 2—Building Resilience; and Phase 3—Implement an Exit Strategy.

Markelova and Mwangi (2010); Vermeulen and Cotula (2010) suggest donor agencies develop clear milestones and exit strategies from the onset of a project to lessen dependency issues and to help increase the chances of the group being sustainable. The CRS clustering process already includes criteria for assessing cluster maturity (see CRS-Philippines 2007, p. 140), so the focus here is on how to incorporate these into a process for implementing an exit strategy for the donor agency. It should be made clear to the farmers from the beginning of the project that intensive support will be provided for a finite period and it is important to emphasise this reality to the cluster members and to the donor agency staff.

Summary of Methods of Linking Smallholder Horticultural Farmers to Modern Markets

Improving the productivity of smallholder farmers and linking them to modern markets will be a key component of transforming the horticultural sector in developing economies. Our belief is that there is a need to focus on 'bottom up' and partnership approaches. Large scale acquisitions of smallholder land by investors are likely to lead to social unrest, while contract farming tends to favour large farmers and to be highly dependent on context. Some authors suggest a more collaborative approach is required. On the other hand cooperatives also have a variable track record and are less likely to be a solution for many smallholder horticultural farmers. Even cooperatives linked to FT and organic markets can struggle. New models of cluster marketing may help in other situations because they overcome some of the problems associated with larger cooperative models, but more research is required into the factors that improve the sustainability of these models without special donor support.

Using Cluster Marketing Groups to Transform the Horticultural Innovation System

As we have argued above, a transformation of the horticulture sector requires development interventions along the smallholder chains, including the services and enabling environment to support the chains, a view that is supported by other authors (Anandajayasekeram and Gebremedhin 2009; Davis 2010; Christoplos et al. 2011; Hawkes and Ruel 2011). This needs to occur at multiple levels, the farmer-group

level, the chain level and the industry and political level. Cluster marketing groups and their chains could form an important part of a horticultural innovation system if they are integrated into a multi-level, action-learning and action-research process (Murray-Prior 2011). The groups could help identify the binding constraints to development and when linked with research and development activities that work on clearly identified and relevant priorities, would develop appropriate solutions that could be scaled up and out with greater confidence and improved impact. Such a system would be more dynamic and could respond more quickly to emerging challenges. It would focus directly on developing solutions to smallholder opportunities and problems, rather than for medium and large-scale farmers, which is the norm with current research and development strategies.

Conclusions

Smallholder horticultural farmers will be an important source of food to supply the growing world demand in the next 40 years, but if they are to achieve the improvements in productivity and effectiveness required, a transformation of the horticultural sector is essential. The complexity of the problems involved requires a holistic approach to transformation that needs to recognise the constraints in smallholder resources and enabling environments and involves addressing issues along the smallholder chains. An agribusiness systems framework is outlined, which for many developing economies is a dualistic agribusiness system that helps focus analysis on the critical constraints and opportunities for smallholder chains in supplying modern horticultural markets. A key issue is the need to adapt existing institutions and develop new institutions to help link smallholder farmers to modern markets. While contract farming works in some contexts, it tends to favour larger farmers and to only be appropriate in selected contexts. Cooperatives also have a role, particularly those linked to FT-organic markets, but once again depend on context and product and hence will also only be part of the solution. We argue that cluster marketing arrangements, because they are more suited to the resources and capacities of smallholder farmers will be an important component of the models for linking them to markets. They also provide an opportunity to identify research priorities, develop appropriate solutions to the relevant problems and opportunities, and test and scale these solutions out and up.

References

Akkaya F, Yalcin R, Ozkan B (2006) Good agricultural practice (GAP) and its implementation in Turkey. Acta Hortic 699:47–52

Anandajayasekeram P, Gebremedhin B (2009) Integrating innovation systems perspective and value chain analysis in agricultural research for development: implications and challenges. Working Paper no. 16. International Livestock Research Institute, Nairobi

Armendariz B, Morduch J (2010) The economics of microfinance, 2nd edn. The MIT, Cambridge

Aubert C, de Janvry A, Sadoulet E (2009) Designing credit agent incentives to prevent mission drift in pro-poor microfinance institutions. J Dev Econ 90(1):153–162. doi:10.1016/j.jdeveco.2008.11.002

Bacon C (2005) Confronting the coffee crisis: can fair trade, organic and specialty coffee reduce small-scale farmer vulnerability in northern Nicaragua? World Dev 33(3):497–511

Baines RN, Davies WP, Batt PJ (2006) Benchmarking international food safety and quality systems towards a framework for fresh produce in the transitional economies. Acta Hortic 699:69–76

Bakucs LZ, Ferto I, Azabo GG (2007) Hungary Market Cooperative: a successful case of linking small farmers to markets for horticultural produce. IIED, London (Regoverning Markets Innovative Practice)

Basilio EL (2008) Linking the Philippine Islands through highways of the sea. Center for Research and Communication Foundation Inc., Pasig City. http://asiafoundation.org/publications/forcedownload.php?f=%2Fresources%2Fpdfs%2FRoRobookcomplete.pdf. Accessed 11 July 2012

Batt PJ (2006) Fulfilling customer needs in agribusiness supply chains. Acta Hortic 699:83–90

Batt PJ (2007) Alternative marketing strategies for smallholder farmers. Stewart Postharvest Rev 3(6):1–5. doi:org/10.2212/spr.2007.6.13

Batt PJ, Murray-Prior R (2011) Quality and ethical sourcing among smallholder coffee producers in Papua New Guinea. In: Jayachandran C, Seshadri S (eds) Proceedings of the 12th International conference of the society for global business and economic development: building capabilities for sustainable global business: balancing corporate success & social good, [CD]. SGBED, Singapore, pp 1488–1496, 21–23 July 2011

Batt PJ, Noonan JN, Kenyon P (2006) Global trends analysis of food safety and quality systems for the Australian food industry. Department of Agriculture Forests and Fisheries, Canberra

Becchetti L, Conzo P, Gianfreda G (2011) Market access, organic farming and productivity: the effects of Fair Trade affiliation on Thai farmer producer groups'. Australian J Agric Resour Econ 56:117–140

Beintema N, Elliott H (2009) Setting meaningful investment targets in agricultural research and development: challenges, opportunities and fiscal realities, how to feed the World in 2050. High-Level Expert Forum, Food and Agriculture Organisation of the United Nations, Rome, 12–13 October

Bernard T, Spielman DJ (2009) Reaching the rural poor through rural producer organizations? A study of agricultural marketing cooperatives in Ethiopia. Food Policy 34:60–69

Beuchelt TD, Zeller M (2012) The role of cooperative business models for the success of smallholder coffee certification in Nicaragua: a comparison of conventional, organic and Organic-Fairtrade certified cooperatives. Renew Agric Food Syst 1–17. doi:10.1017/S1742170512000087

Bryant CR (1989) Entrepreneurs in the rural environment. J Rural Stud 5(4):337–348. doi:10.1016/0743-0167(89)90060-0

Canlas DB, Khan ME, Zhuang J (2011) Critical constraints to growth and poverty reduction. In: Canlas DB, Khan ME, Zhuang J (eds) Diagnosing the philippine economy: toward inclusive growth. Anthem and Asian Development Bank (ADB), London, pp 33–97

Checkland P (1981) Systems thinking, systems practice. Wiley, Chichester

Chibanda M, Ortmann GF, Lyne MC (2009) Institutional and governance factors influencing the performance of selected smallholder agricultural cooperatives in KwaZulu-Natal. Agrekon 48(3):293–315. doi:10.1080/03031853.2009.9523828

Christoplos I, Sandison P, Chipeta S (2011) Guide to extension evaluation. Global Forum for Rural Advisory Services (GFRAS), Lindau

Christy R, Mabaya E, Wilson N, Mutambatsere E, Mhlanga N (2009) Enabling environments for competitive agro-industries. In: Da Silva CA, Baker D, Shepherd AW, Jenane C, Miranda-da-Cruz S (eds) Agro-industries for development. CAB International, UNIDO and FAO, Rome

Codron J-M, Grunert K, Giraud-Heraud E, Soler L-G, Regmi A (2005) Retail sector responses to changing consumer preferences: the European experience. In: Regmi A, Gehlhar M (eds) New directions in global food markets. USDA, Washington, pp 32–46 (Agriculture Information Bulletin no. 794)

Concepcion SB, Digal LN, Guarin R, Hualda LAT (2007a) Keys to inclusion of small-scale organic rice producers in supermarkets: the case of Upland Marketing Foundation Inc. Regoverning Markets Innovative Practice series. http://www.regoverningmarkets.org/en/filemanager/active?fid=810. Accessed 6 Sept 2012

Concepcion SB, Digal LN, Uy J (2007b) Keys to inclusion of small farmers in dynamic markets: the case of Norminveggies in the Philippines. Regoverning Markets Innovative Practice series. http://www.regoverningmarkets.org/en/filemanager/active?fid=810. Accessed 6 Sept 2012

Concepcion SB, Digal LN, Guarin R, Hualda LAT (2011) Small-scale organic rice producers sell to Philippine supermarkets: upland marketing foundation incorporated. In: Bienabe E, Berdegué J, Peppelenbous L, Belt J (eds) Reconnecting markets: innovative global practices in connecting small-scale producers with dynamic food markets. Gower Publishing Limited, Surrey, pp 77–93

Cook ML, Chaddad FR (2004) Redesigning cooperative boundaries: the emergence of new models. Am J Agric Econ 86(5):1249–1253

CRS-Philippines (2007) The clustering approach to agroenterprise development for small farmers: the CRS-Philippines experience—a guidebook for facilitators. Catholic Relief Services—USCCB, Philippine Program, Davao

Davies WP, Baines RN, Turner JC (2006) Red alert: food safety lessons from dye contamination in spice supply. Acta Hortic 699:143–150

Davis JH (1955, 17 Oct) Business responsibility and the market for farm products. Address to the Boston conference on Distribution. Retail Board, Boston

Davis JH, Goldberg RA (1957) A concept of agribusiness. Division of Research, Graduate School of Business Administration, Harvard University, Boston

Davis KE (2010) The what, who, and how of shaping change in African communities through extension. Ext Farm Syst J 6:83–90

De Oliveira W (2007) Agricultural risk management as a tool to improve the agribusiness environment in Ukraine. In: Tanic S (ed) Proceedings of the enabling environments for agribusiness and agro-industry development in Eastern Europe and Central Asia. Food and Agriculture Organization of the United Nations, Budapest, pp 57–71

DESA (UN Department of Economic and Social Affairs) (2011) World economic and social survey 2011: the great green technological transformation. Department of Economic and Social Affairs, United Nations Secretariat, New York

Diao X, Hazell P, Thurlow T (2010) The role of agriculture in African development. World Dev 38(10):1375–1383

Eaton C, Shepherd AW (2001) Contract farming: partnership for grow. Food and Agricultural Organization, Rome (Agricultural Services Bulletin 145)

Fairtrade International (2012) Products. http://www.fairtrade.net/products.html. Accessed 16 Aug 2012

FAO (2009) How to Feed the World in 2050. High-Level Expert Forum, Food and Agriculture Organisation of the United Nations, Rome, 12–13 Oct

FAO (2010) The state of food insecurity in the World: addressing food insecurity in protracted crises. Food and Agriculture Organization of the United Nations, Rome. www.fao.org. Accessed 3 July 2011

FFTC (2006) Agricultural cooperatives in Asia: innovations and opportunities for the 21st century. Food and Fertilizer Technology Centre, Annual Report, Taipei

Gehlhar M, Regmi A (2005) Factors shaping global food markets. In: Regmi A, Gehlhar M (eds) New directions in global food markets. USDA, Washington, DC, pp 5–17 (Agriculture Information Bulletin no. 794)

Glover D, Kusterer K (1990) Small farmers, big business: contract farming and rural development. Macmillan, London

Habito CF, Briones RM (2005) Philippine agriculture over the years: performance, policies and pitfalls. Paper presented to Asia-Europe Meeting (ASEM) Trust Fund, Asian Institute of Management Policy Center, Foreign Investment Advisory Services, Philippines Institute of Development Studies and the World Bank Conference "Policies to Strengthen Productivity in

the Philippines", Makati City. 27 June 2005. http://siteresources.worldbank.org/INTPHILIPPINES/Resources/Habito-word.pdf. Accessed 27 July 2010

Hawkes C, Ruel MT (2011) Value chains for nutrition, Paper presented to IFPRI 2020 International Conference "Leveraging Agriculture for Improving Nutrition and Health", New Delhi 10–12 February. International Food Policy Research Institute, Washington, DC. http://2020conference.ifpri.info/. Accessed 4 July 2011

Hazell P, Poulton C, Wiggins S, Dorward A (2006) The future of small farms: synthesis paper. www.rimisp.org. Accessed 15 June 2012

Headey D, Fan S (2010) Reflections on the global food crisis: how did it happen? how has it hurt? and how can we prevent the next one? International Food Policy Research Institute, Washington, DC. www.ifpri.org. Accessed 3 July 2011

Humphrey J (2006) Horticulture: responding to the challenges of poverty reduction and global competition. Acta Hortic 699:19–41

Islam N (2011) Foreign aid to agriculture: review of facts and analysis. IFPRI Discussion Paper 01053. International Food Policy Research Institute, Washington, DC. http://www.ifpri.org. Accessed 3 July 2011

Kaferstein FK (2003) Actions to reverse the upward curve of foodborne illness. Food Control 14:101–109

Kahan DG (2007) Business services in support of farm enterprise development: case studies. FAO, Rome

Kaine G, Cowan L (2011) Using general systems theory to understand how farmers manage variability, systems research and behavioral science. doi:10.1002/sres.1073

Kelly PF (2003) Urbanization and the politics of land in the Manila Region. Ann Am Acad Polit Soc Sci 590:170–187

Ketelaar J (2007) GAP, market access, farmers and field realities: making the connection through better farmer education integrated production and pest management. In: Batt PJ, Cadilhon J-J (eds) Proceedings of the international symposium on fresh produce supply chain management. FAO, Rome, pp 345–349 (RAP 2007/21)

Key N, Runsten D (1999) Contract farming, smallholders, and rural development in Latin America: the organization of agroprocessing firms and the scale of outgrower production. World Dev 27(2):381–401

Lele U (1981) Co-operatives and the poor: a comparative perspective. World Dev 9:55–72

Lewis WA (1954) Economic development with unlimited supplies of labour. Manch School 22:139–191

Lundy M, Gottret MV, Best R, Ferris S (2005) A guide to developing partnerships, territorial analysis and planning together. Manual 1: territorial approach to rural agro-enterprise development, Cali. Rural Agro-enterprise Development Project, CIAT, International Center for Tropical Agriculture, Colombia

Markelova H, Mwangi E (2010) Collective action for smallholder market access: evidence and implications for Africa. Rev Policy Res 27(5):621–640 doi 10.1111/j.1541-1338.2010.00462.x

Martech Consulting. 2005. Trends that impact New Zealand's horticultural food exports. Growing futures cast study series. http://www.martech.co.nz/images/21trends.pdf

Mendoza RU, Vick BC (2010) From revolution to evolution: charting the main features of microfinance 2.0. Perspect Glob Dev Technol 9:545–580. doi:10.1163/156914910x499813

Moustier P (2012) Reengaging with customers: proximity is essential but not enough. Acta Hortic [in press]

Murray-Prior R (2007a) Methodological frameworks for improving linkages and the competiveness of supply chains. In: O'Reilly S, Keane M, Enright P (eds) Proceedings of the 16th international farm management association congress "a vibrant rural economy—the challenge for balance", University College Cork, Cork, 15–20 July. International Farm Management Association, vol Peer Reviewed Papers, vol I, pp 195–201. http://www.ifmaonline.org/pages/con_full_articles.php?abstract=416

Murray-Prior R (2007b) The role of grower collaborative marketing groups in developing countries. Stewart Postharvest Rev 3(6):1–10
Murray-Prior R (2008) Are farmers in transitional economies likely to benefit from forming collaborative marketing groups? Banwa Manag 8(2):10–21
Murray-Prior R (2011) A participatory market-driven approach to development & extension. Paper presented to innovations in extension & advisory services: Linking Knowledge to Policy & Action for Food & Livelihoods, Nairobi, 15–18 Nov 2011
Murray-Prior R, Batt PJ (2007) Emerging possibilities and constraints to PNG smallholder coffee producers entering the speciality coffee market. In: Batt PJ, Cadilhon J-J (eds) Proceedings of an international symposium on fresh produce supply chain management, Lotus Pang Suan Kaeo Hotel, Chiang Mai, Thailand, pp 372–387, 6–9 Dec. FAO, Rome
Murray-Prior R, Ncukana L (2000) Agricultural development in South Africa—a dualistic agribusiness systems perspective, paper presented to the 'African Studies Association of Australasia & the Pacific 23rd Annual & International Conference: African Identities. St Marks College, University of Adelaide, North Adelaide, 13–15 July 2000
Murray-Prior R, Concepcion S, Batt P, Rola-Rubzen MF, McGregor M, Rasco E, Digal L, Manalili N, Montiflor M, Hualda L, Migalbin L (2004) Analyzing supply chains with pluralistic and agribusiness systems frameworks. Asian J Agric Dev 1(2):45–56
Murray-Prior R, Batt PJ, Rola-Rubzen MF, McGregor MJ, Concepcion SB, Rasco ET, Digal LN, Montiflor MO, Hualda LT, Migalbin LR, Manalili NM (2006) Global value chains: a place for Mindanao producers? Acta Hortic 699:307–315
Murray-Prior R, Batt PJ, Dambui C, Kufinale K (2008) Improving quality in coffee chains in Papua New Guinea'. Acta Hortic 794:247–255
Murray-Prior R, Sengere R, Batt PJ (2009) Overcoming constraints to the establishment of collaborative marketing groups for coffee growers in the highlands of PNG. Acta Hortic 831:277–283
Murray-Prior RB, Batt PJ, Rola-Rubzen MF, Concepcion SB, Montiflor MO, Axalan JT, Real RR, Lamban RJG, Israel F, Apara DI, Bacus RH (2012) Theory and practice of participatory action research and learning with cluster marketing groups in Mindanao, Philippines. Acta Hortic [in press]
Nelson GC, Rosegrant MW, Palazzo A, Gray I, Ingersoll C, Robertson R, Tokgoz S, Zhu T, Sulser TB, Ringler C, Msangi S, You L (2010) Food security, farming, and climate change to 2050: scenarios, results, policy options. IFPRI Research Monograph. www.ifpri.org. Accessed 4 July 2011
Nilsson J, Svendsen GLH, Svendsen GT (2012) Are large and complex agricultural cooperatives losing their social capital? Agribusiness 28(2):187–204. doi 10.1002/agr.21285
OECD/FAO (2012) OECD-FAO Agricultural outlook 2012–2021. OECD Publishing and FAO. doi:10.1787/agr_outlook-2012-en
Olchondra RT (2010) Da, Irri, Globe Telecom to give rice farmers timely information. Philippine Daily Inquirer, 8 June 2012. http://business.inquirer.net/money/breakingnews/view/20100608-274592/DA-IRRI-Globe-Telecom-to-give-rice-farmers-timely-information. Accessed 31 May 2012
Oxfam (2008) Investing in poor farmers pays: rethinking how to invest in agriculture. www.oxfam.org. Accessed 15 Aug 2012 (Oxfam Briefing Paper No. 129)
Pinstrup-Andersen P, Watson D (2011) Food policy for developing countries. Cornell University, Ithaca
Pirotte G, Pleyers G, Poncelet M (2006) Fair-trade coffee in Nicaragua and Tanzania: a comparison. Dev Pract 16(5):441–451. doi 10.1080/09614520600792390
Polack E (2012) Agricultural land acquisitions: a lens on Southeast Asia. International Institute for Environment and Development, London. http://pubs.iied.org/pdfs/17123IIED.pdf. Accessed 3 May 2012
Prantilla EB (2011) Rapid field appraisal of decentralization: Davao Region. The Asia Foundation, Makati City

Prowse M (2012) Contract farming in developing countries—a review, a Savoir, vol 12, Paris: de Agence Francaise development. http://recherche.afd.fr. Accessed 11 June 2012
Quinones BR, Seibel HD (2000) Social capital in microfinance: case studies in the Philippines. Policy Sci 33(3):421–433
Reardon T, Huang J (2008) Patterns in and determinants and effects of farmers' marketing strategies in developing countries. Synthesis report: micro study. www.regoverningmarkets.org. Accessed 6 September 2012
Reyes CM (2002) Impact of agrarian reform on poverty. Philippine J Dev 29(2):63–131
Rola-Rubzen MF, Murray-Prior RB, Batt PJ, Concepcion SB, Real RR, Lamban RJG, Axalan JT, Montiflor MO, Israel F, Apara DI, Bacus RH (2012) Impact of clustering on vegetable farmers in the Philippines. In: Proceedings of smallholder hopes: horticulture, people and soil conference, Cebu Parklane International Hotel, Cebu, Philippines, 3 July 2012. ACT: Australian Centre for International Agricultural Research, Canberra [in press]
Rottger A, Da Silva CA (2007) Enabling environments for agribusiness and agro-industry development in Africa. Food and Agriculture Organization of the United Nations, Accra
Schrekenberg K, Mitchell J (2011) Who runs this place? The external enabling environment for value chain development. In: Mitchell J, Coles C (eds) Markets and rural poverty: upgrading in value chains. International Development Research Centre, Ottawa, pp 217–234
Shepherd AW (2005) The implications of supermarket development for horticultural farmers and traditional marketing systems in Asia. Agricultural Management, Marketing and Finance Service, FAO, Rome
Shepherd AW, Galvez E (2007) The response of traditional marketing channels to the growth of supermarkets and to the demand for safer and higher quality fruit and vegetables with particular reference to Asia. In: Batt PJ, Cadilhon J-J (eds) Proceedings of the international symposium on fresh produce supply chain management. FAO, Rome, pp 305–314 (RAP 2007/21)
Shepherd AW, Tam PTG (2008) Improving the safety of marketed horticulture produce in Asia with particular reference to VietNam. Acta Hortic 794:301–308
Singer H (1970) Dualism revisited: a new approach to the problems of dual-societies in developing countries. J Devel Stud 7(1):60–61
Singh S (2007) Contract farming: theory and practice in the 21st century. Stewart Postharvest Rev 3:1–6. www.stewartpostharvest.com. Accessed 13 August 2012
Smit J, Nasr J (1992) Urban agriculture for sustainable cities: Using wastes and idle land and water bodies as resources. Environ Urban 4(2):141–152. doi 10.1177/095624789200400214
Sofranko A, Frerichs R, Samy M, Swanson B (2000) Will farmers organize? structural change and loss of control over production. http://web.aces.uuiuc.edu/value/research/organize.htm. Accessed 1 May 2011
Teruel RG, Kuroda Y (2005) Public infrastructure and productivity growth in Philippine agriculture, 1974-2000. J Asian Econ 16(3):555–576. doi 10.1016/j.asieco.2005.04.011
Thomas B, Hangula MM (2011) Reviewing theory, practices and dynamics of agricultural cooperatives: understanding cooperatives' development in Namibia. J Dev Agric Econ 3(16):695–702. http://www.academicjournals.org/JDAE. Accessed 17 July 2012
Trewin R (2004) Cooperatives: issues and trends in developing countries. Report of workshop. ACIAR, Perth 24–25 March 2003
Valkila J (2009) Fair Trade organic coffee production in Nicaragua—Sustainable development or a poverty trap? Ecol Econ 68(12):3018-3025. http://www.sciencedirect.com/science/article/pii/S0921800909002742. Accessed 17 July 2012
Vermeulen S, Cotula L (2010) Making the most of agricultural investment: a survey of business models that provide opportunities for smallholders. IIED/FAO/IFAD/SDC, London
Viatte G, De Graaf J, Demeke M, Takahatake T, de Arce MR (2009) Responding to the food crisis: synthesis of medium-term measures proposed in inter-agency assessments. www.fao.org/. Accessed 4 July 2011
von Bertalanffy L (1968) General system theory: Foundations, development, applications, ringwood. Penguin Books, NSW

Vorley B (2011) Small farms and market modernisation. International Institute for Environment and Development, London. http://pubs.iied.org/pdfs/G03126.pdf. Accessed 29 July 2012
Vorley B, Lundy M, MacGregor J (2009) Business models that are inclusive of small farmers. In: da Silva CA, Baker D, Shepherd AW, Jenane C, Miranda-da-Cruz S (eds) Agro-industries for development. CAB International and FAO, Rome, pp 186–222
Warner M, Kahan D, Lehel S (2008) Market-oriented agricultural infrastructure: appraisal of public-private partnership. FAO, Rome