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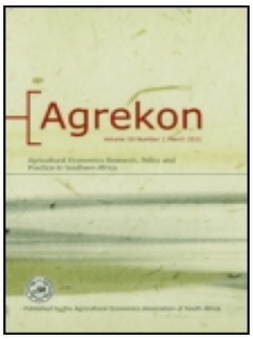

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CONCEPTUAL FRAMEWORK FOR VALUE CHAIN ANALYSIS FOR POVERTY ALLEVIATION AMONG SMALLHOLDER FARMERS

Henry Jordaan*, Bennie Grové** and Gerhard R. Backeberg***

ABSTRACT

Despite volumes of research and substantial investments by government, the financial performance of smallholder farmers in South Africa remains poor. The past decade saw little change in the general behaviour of smallholder farmers, and the stumbling blocks faced by smallholder farmers who want to participate in commercial agri-food chains. A possible reason may be that researchers tend to focus on the current behaviour and performance of the farmers while neglecting the influence of the incentive structure on their behaviour. The aim of this paper is to develop a conceptual framework that allows for a more holistic analysis of farmers and their value chains to better understand the reasons underlying current behaviour, and to identify potential solutions to change the behaviour of the farmers and relevant role-players to better match the requirements for successfully participating in competitive agri-food chains. The integrated value chain, New Institutional Economics – Structure-Conduct-Performance framework, does allow for a comprehensive analysis of the incentive structure embedded in the social, physical and institutional environment within which the farmers operate. Special attention is also awarded to the relationship between the farmers and their buyers to identify the appropriate coordination strategy that will minimise transaction costs.

Keywords: value chain analysis, New Institutional Economics, Structure-Conduct-Performance, smallholder farmers, linking farmers to markets, uplifting smallholder farmers, poverty alleviation

JEL: O13; Q15

1 INTRODUCTION

Poverty is a major cause for concern in South Africa. According to the United Nations Development Programme (UNDP) (2003), 48.5% of the South African

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population lives below the poverty line. The Water Research Commission (WRC) (2008) argues that the only way in which an impact can be made to improve the livelihoods of the rural poor is by giving them access to available resources or assets in agriculture. The new democratic government of South Africa also recognises the role that can be played by agriculture in alleviating rural poverty as is evident from the prominence of agriculture in the National Development Plan (NDP) of the National Planning Commission (NPC) of South Africa and the Comprehensive Rural Development Programme (CRDP) that is implemented by the Department of Rural Development and Land Reform. According to NPC (2011), agriculture (commercial and small scale) has the potential to create about one million new jobs (direct and indirect) by 2030. NPC (2011) argues that the expansion of irrigated agriculture, supplemented by dry-land production where feasible, will be the driving force to meet the vision of the NPC for 2030 that South Africa's rural communities should have greater opportunities to participate fully in the economic, social and political life of the country. CRDP is part of government's plans to accelerate growth in rural areas. Essentially the programme aims to enable people living in the rural areas to use the natural resources at their disposal to become economically active (Republic of South Africa (RSA), 2009). Government is of the view that small-scale farmers can contribute significantly to the reduction of food insecurity (Molewa and Doidge, 2010). According to Backeberg and Sanewe (2010), agriculture contributes to economic development and rural livelihoods by providing food products, but it also represents a range of opportunities for earning income in production, processing, distribution and retailing phases of the food value chain. The role of agriculture thus extends the mere provision of food to rural communities. Smallholder farmers are thus expected to have a major role to play in the alleviation of rural poverty in South Africa.

However, Van Averbeke, Denison and Mnkeni (2011) found that most smallholder irrigation schemes perform well below their potential. The poor performance of smallholder farmers is a major cause for concern. Since the beginning of democracy in South Africa in 1994, government has committed itself to working towards decreasing rural poverty through the implementation of policies that include initiatives to link smallholder farmers to commercial agricultural value chains (Letsoalo and Van Averbeke, 2005). Government has also spent a large amount of money on research projects on ways to successfully link smallholder farmers to commercial agri-food chains, and on the revitalisation of smallholder irrigation schemes (Denison and Manona, 2007). Despite the commitment from government and the huge investments made to help smallholder farmers from smallholder irrigation schemes to be integrated into commercial agri-food chains, the performance of the smallholder farmer in commercial agri-

food chains leaves much to be desired. Ultimately, the poor performance of the smallholder farmers means that the objective to allow farmers to improve their livelihoods through irrigated agriculture is not met.

Various researchers in South Africa and southern Africa have endeavoured research on the topic of successfully linking smallholder farmers to markets as a means to alleviate rural poverty. Most of those researchers have investigated the stumbling blocks that exclude smallholder farmers from participating in commercial agri-food chains. The stumbling blocks that were identified in such research include, among others, the stringent requirements of commercial agri-food chains in terms of consistent supply of good quality produce (Louw *et al.*, 2008; Bienabe and Vermeulen, 2007); the small scale of operations of smallholder farmers (Khaile, 2012; Baloyi, 2010; Randela *et al*., 2008; Masuku *et al*., 2007; Ntsonto, 2005; Perret, 2002; Matungul *et al*., 2001); insecure property rights (Khaile, 2012; Baloyi, 2010; Ortmann and King, 2010; Ntsonto, 2005; Matungul *et al*., 2001); lack of access to credit (Khaile, 2012; Baloyi, 2010; Van der Heijden, 2010); poor conditions of physical infrastructure (Van der Heijden, 2010; Baloyi, 2010; Jari and Fraser, 2009; Ortmann and King, 2010; Matungul *et al*., 2001); lack of trust among value chain participants (Van der Heijden, 2010; Randela *et al*., 2008, Vermeulen *et al*., 2008; Albu and Griffith, 2006; Anseeuw, Van Rooyen, and D'Haese, 2002); lack of market information (Baloyi, 2010; Randela *et al*., 2008; De Bruyn *et al*., 2001; Masuku *et al*., 2001); long distances to the market (van der Heijden, 2010; Baloyi, 2010; De Bruyn *et al*., 2001; Masuku *et al*., 2001); and the lack of support services (Van der Heijden, 2010; Anseeuw *et al*., 2000). Based on the identified stumbling blocks, recommendations then are made on how the farmers and government should change their behaviour to allow the farmers to overcome the stumbling blocks. Alarmingly, the stumbling blocks that were documented by researchers in the early 2000s are very similar to the stumbling blocks that were identified by researchers even in 2010 and 2012. The behaviour of the farmers and other role-players thus proves not to have changed considerably despite the recommendations from the volume of research.

Some researchers have reported success stories in recent years where smallholder farmers from South Africa are successfully participating in commercial agri-food chains. Some of the success stories include the studies by Hendriks and Lyne (2009), Louw *et al.* (2008), Louw, Vermeulen and Madevu (2006), Bediako and Debrah (2007), Ewert, Eva and Hamman (2006), and Sartorius and Kirsten (2002). The potential contribution of collective action and vertical coordination to overcome some of the stumbling blocks is very evident from the documented success stories. Collective action allows the farmers to overcome the problems associated with the small scale of operations. Vertical coordination proves to give farmers ready access to a market for their produce, but also to substantial

levels of support from their transacting partners. Through the vertical coordinated relationships the farmers mainly receive technical support and market information, but in some cases also financial support. Collective action and vertical coordination thus allow smallholder farmers to overcome a number of the stumbling blocks that typically exclude smallholder farmers from participating in commercial agri-food chains. The success stories provide good descriptions of the way in which the role-players behave in the successful operations of the farmers in commercial agri-food chain. Based on the behaviour of the role-players in the success stories other smallholder farmers are recommended to form co-operatives and to enter into vertical coordinated relationships with their transacting partners.

Both groups of research focus mainly on the way in which the farmers and other role-players behave and make recommendations for change in the behaviour that likely will contribute to the level of success with which the farmers operate in commercial agri-food chains. The theory of New Institutional Economics (NIE), however, suggests that the behaviour of economic agents is influenced by the social and institutional environments in which they operate. The social environment includes the social dynamics within the communities of farmers under consideration. The degree of success with which a group of smallholder farmers will operate collectively is influenced by the social capital of the individuals (Putnam, 1993) and the social dynamics (i.e. customs, norms and traditions) within the community. Moreover, the influence of social dynamics within different communities means that no single model exists that can be replicated in different regions (Louw *et al*., 2006). The institutional environment contains the rules and regulations that aim to create order to protect individuals against opportunistic behaviour, but also the incentives that guide the behaviour of economic agents under consideration (Milagrosa, 2007). Importantly, the incentives guide the behaviour of the farmers, but also the behaviour of the transacting partners and the individuals/organisations that can support the farmers to overcome the stumbling blocks. The social and institutional environments thus have a major influence on the behaviour of all of the parties that may contribute to smallholder farmers successfully overcoming the stumbling blocks. By ignoring the social and institutional environment the researchers make recommendations for change without considering the existing incentive structure that caused the current behaviour in the first place. The failure to consider the existing incentive structure when making recommendations to change behaviour may be a reason for the failure to change the behaviour effectively to allow the farmers to successfully participate in commercial agri-food chains.

The objective of this paper is to develop an integrated conceptual framework that can be used to analyse the agri-food chains within which smallholder farmers operate with the aim to improve the financial performance of the farmers, and hence

the level of success with which they operate in their value chains. An integrated value chain (VC), a New Institutional Economics (NIE) – Structure-Conduct-Performance (SCP) framework is developed to allow for considering the typical stumbling blocks, as well as the aspects that seem to contribute to smallholder farmers overcoming stumbling blocks in efforts to participate in commercial agri-food chains. The value chain concept of Roduner (2007) is used in this framework to expand the focus on the actors who are directly involved with moving the physical product from the input suppliers to the end consumer (value chain players), to also include the actors who provide the rules and regulations that have to be met (value chain influencers) by the value chain players, and the support structures (value chain supporters) that are available to support the value chain players to comply with the rules and regulations specified by the influencers. The integration of the NIE-SCP framework into the extended value chain framework extends the value chain influencers to also include the social and physical environment that influences the behaviour of the farmers, while also allowing for special attention to be awarded to the relationship between the different value chain players. The integrated VC-NIE-SCP framework thus allows a researcher to consider all of the typical stumbling blocks that constrain the behaviour of emerging farmers, and the success factors that prove to contribute to the success in cases where emerging farmers are successfully operating in commercial agri-food chains. Thus, instead of focusing only on the current behaviour and performance of the farmers under consideration, the developed framework also provides insight into the incentive structures that influence the behaviour of all role-players in the value chain under consideration.

2 DEVELOPMENT OF THE INTEGRATED VALUE CHAIN: NEW INSTITUTIONAL ECONOMICS (NIE) – STRUCTURE-CONDUCT-PERFORMANCE (SCP) FRAMEWORK

Much of the research on value chain analysis considers only those actors who are directly involved with moving the physical product from the input suppliers to the end consumer. Roduner (2007) argues for a systemic view of value chains that integrates three important levels within a value chain network, namely, value chain players, influencers and supporters. A systemic view of the value chain allows for the discovery of opportunities and bottlenecks within these levels, as well as in the dynamic interactions between the levels. The actors who are directly involved with transforming the physical product into the final product are called the *value chain players*. The relationships between the value chain players, especially between the farmers and their buyers, are crucially important. However, the value chain players

do not operate in isolation. There are a number of rules and regulations that have to be complied with when operating within a value chain. Roduner (2007) calls those rules and regulations *value chain influencers*. Value chain influencers influence the operations within the chain by providing the regulatory and administrative conditions that have to be met by all players within the value chain. The impact of the lack of trust among transacting partners, and the role of the poor condition of physical infrastructure (i.e. road networks) as entry barriers for emerging farmers, show that the value chain players are also influenced by the social and physical environments within which they operate. The concept of value chain influencers as used by Roduner (2007) thus should be extended to also consider the social and physical environments within which the farmers operate. The last level is called the *value chain supporters*. These include all actors responsible for providing information, training and support to the value chain players. The value chain supporters have the responsibility to support the value chain players to operate in such a manner that they meet all the rules and regulations specified by the influencers. The approach followed by Roduner (2007) thus provides a holistic view of the value chain under consideration. Rather than focusing only on the processes by which inputs are transformed into the final product, it considers all factors that influence the way the value chain players operate within the chain, and also all the support services available to allow value chain players to operate in such a way as to keep the value chain competitive.

In order to ensure a comprehensive analysis of all three levels of the value chain, the integrated New Institutional Economics (NIE) and Structure-Conduct-Performance (SCP) framework (Milagrosa, 2007) is integrated into the value chain framework of Roduner (2007). The integrated NIE-SCP approach allows the theoretical examination of society on four interrelated levels (the social embeddedness level, institutional environment, governance structures and resource allocation), and then also the appropriate evaluation at the lower three levels using the structure-conduct-performance analysis framework, which is more of an applied approach. Milagrosa (2007) argues that there are strong similarities between the two frameworks, but that the differences allow for the two approaches to supplement each other at points where the other method is deficient. The high degree of similarity and complementarity between the two frameworks contributes to the integrated NIE-SCP approach, giving much more depth when assessing behaviour within the value chain. By integrating the NIE-SCP framework into the value chain framework an in-depth analysis of all three levels of the value chain is ensured. The new integrated framework is presented in Figure1.

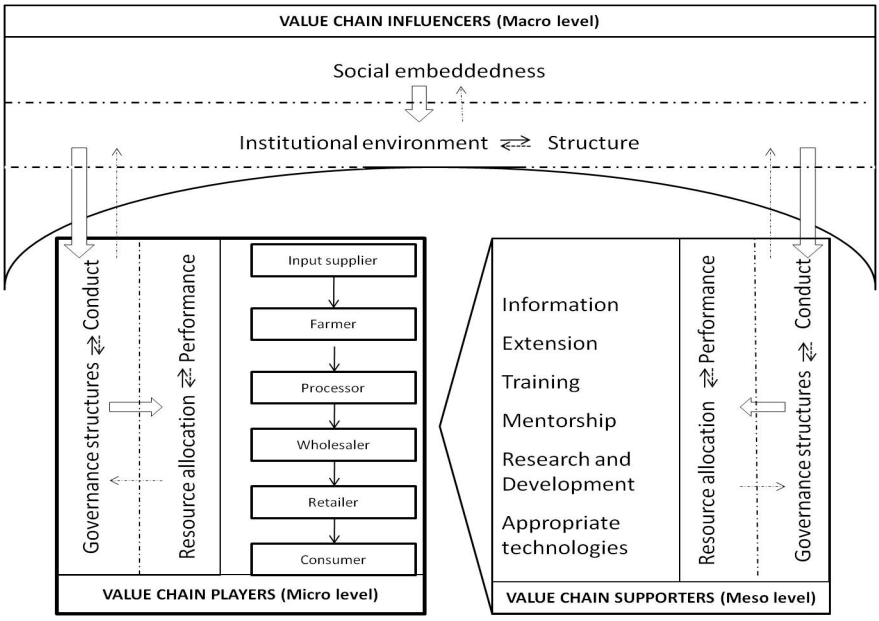

Figure 1: Conceptual framework for the analysis of agri-food value chains

Figure 1 shows that the value chain influencers in the new integrated framework consist of the social environment (social embeddedness of NIE), the physical environment (structure of SCP), and the institutional environment (of NIE). The downward arrow from the social embeddedness level to the structure and institutional environment represents the constraints that are imposed from the higher level on the lower level. The existing social environment thus imposes constraints on the institutional and physical environments within which the different role-players operate. The upward arrow in turn represents the feedback from the lower level to the upper level. In the long run the physical and institutional environments thus may influence the social environment through feedback (Milgrosa, 2007).

Figure 1 also shows that the level in the integrated framework that is concerned with conduct (of SCP) and governance structures (of NIE) again is influenced by constraints imposed by the physical (structure) and institutional environments. Moreover, it is important to note that the value chain influencers provide the environment within which both the value chain players and the support structures have to operate. Figure 1 thus shows that the physical and institutional environment

also influence the behaviour (conduct and governance structures) of the support structures. The conceptual framework thus also allows for a comprehensive analysis of the behaviour and performance of the support structures.

Lastly, the behaviour (conduct and governance structures) of the value chain players and supporters has a direct influence on their performance (of SCP) and the way they allocate their resources. The dynamic nature of the integrated NIE-SCP framework also allows for feedback from the performance of the value chain players and supporters to have an influence on the behaviour (conduct and governance structures), and indirectly on the physical, institutional and social environment within which they operate. The strengths of the NIE-SCP framework and the value chain framework thus complement each other very well to allow for a comprehensive analysis of the agri-food chains under consideration.

Next the respective components of the integrated framework are discussed in more detail, with special emphasis on the contribution that is made towards addressing the stumbling blocks that typically exclude smallholder farmers from participating in commercial agri-food chains through the integration of the frameworks.

2.1 Social embeddedness

Social embeddedness is located at the highest level and refers to customs, traditions and societal norms (Williamson, 2000). Changes in social embeddedness occur at rates of centuries to millennia, and consequently the level of social embeddedness often is taken as a given by economists (Williamson, 1998). The concept of social embeddedness has been advanced, however, to explain why informal constraints have such a major influence upon the long-term character of economies (Granovetter, 1985, as cited by Williamson, 2000). Putnam (1993) also states that economists are increasingly interested in the role of culture to explain why some countries or regions are rich and others remain poor.

The level of social embeddedness can be analysed using social capital theory (Williamson, 2000; Milagrosa and Slangen, 2005). Social capital consists of observable but non-contractual elements such as trust, shared norms and social networks (Slangen, 2005, as cited by Milagrosa, 2007). Putnam (1993) defines social capital as being features of social organisation (for example trust, norms and networks) that can improve societal efficiency by facilitating coordinated action. Other elements also include volunteerism, reciprocity, associatedness, formal and informal organisation, traditions and beliefs. Of all of these elements, trust is argued to be the most important, since trust can make people go beyond the requirements of the contract, through early delivery, higher quality or some other means, to support their good intentions and sustain trust (Milagrosa and Slangen, 2005).

From the literature, there is ample evidence to prove the significance of social capital. It is acknowledged that social capital is an important factor behind economic development (Beugelsdijk and Schaik, 2001), since trust, norms and networks boost economic and institutional machinery (Putnam, 1993). It has also been argued that long-term economic development efforts hinge strongly on the levels of national, regional or local social capital (Ostrom and Ahn, 2001, as cited by Milagrosa and Slangen, 2005). The acknowledgement of the importance of social capital is complemented by research that shows that social networks influence economic performance and general productivity. Putnam (1993) found that social capital has a major influence on horizontal networks, which in turn were found to play a major role in economic growth in northern Italy. Chuzu (2005) cites Maluccio, Haddad and May (1999), who specify three mechanisms whereby household welfare might be affected by group activity. Firstly, group activity may reduce transaction costs by improving the flow of important information, such as new opportunities or threats, from one member to the next. Secondly, group activity may also promote consultative decision making and collective action. Lastly, group activity contributes to "the fostering of time-sensitive exchanges for mutual benefit by developing norms of civil behaviour, trust, and reputation dissemination". According to Murray (2005), there is also a reciprocal relationship between participation in group activities and trust. The more people participate in their communities, the more they learn to trust one another. Again, the more people trust one another, the more they are likely to participate in group activities. The reciprocal relationship shows the importance of using group activity continuously to increase social capital levels in order to benefit economic development.

The analysis of the social embeddedness level thus will contribute to a better understanding of the levels of trust in the community as part of the social capital analysis. Lack of trust was identified as one of the stumbling blocks contributing to the high transaction costs that exclude farmers from participating in commercial agri-food chains. A better understanding of the trust levels may contribute to improving the relationship between the different value chain participants, and hence may help the farmers to successfully participate in the value chain.

2.2 Institutional environment and structure

2.2.1 Institutional environment

The institutional environment refers to all the formal rules and informal constraints that regulate the way transactions are carried out (Williamson, 2000). Institutions are humanly devised constraints that structure human interaction (North, 1994). The importance of the institutional environment lies in the fact that institutions

form the incentive structure of a society, and the political and economic institutions, in consequence, are the underlying determinants of economic performance (North, 1994). Institutions therefore play a significant role in shaping events at the downstream levels of governance and resource allocation. Good institutions and good governance structures contain efficient information transfer mechanisms, which result in better informed decisions among parties involved. Good institutions thus create a more favourable environment, which supports economic growth. As argued by Milagrosa (2007), economic development and good institutions are mutually occurring reciprocal phenomena. On the one hand, economically developed areas demand and contribute to good institutions. On the other hand, a good institution creates economic development.

Formal rules and regulations

Actors involved in the production and marketing of agricultural products need protection against opportunistic behaviour. The types of protection mechanisms and the manner in which government arranges those mechanisms are translated into the formal rules of the institutional environment (Milagrosa, 2007). The formal rules include constitutions, laws, and other rules (North, 1994). The rules in the institutional environment aim to facilitate economic transactions and have to be respected by all actors in the market (Hai, 2003). The formal rules have the purpose to ensure that transactions are conducted in an efficient manner from society's point of view. These formal rules and regulations are nowadays even more important than ever since more agricultural producers are linked to consumers and corporations of the rich nations. Those consumers not only demand choice, they also want quality, consistency and value (Kherallah and Kirsten, 2002). In order to supply agricultural produce to such buyers, producers have to meet the requirements specified in the formal rules and regulations at the institutional level.

As formal rules, property rights have a major influence on the way transactions are conducted. Slangen, Van Kooten and Suchánek (2004) argue that property rights over land and water are probably the most important formal rules in agriculture. The importance of property rights centres on the fact that externalities can be internalised if property rights are well established (Coase, 1937). Property rights refer to formal and informal rules that determine access to assets, both tangible (i.e. land, water, buildings, etc.) and intangible (i.e. contract rights, patents, etc.), and also the way those assets can be used (Herrera, 2005). The property rights give the holder of those rights the right to derive value from the asset by using it as he or she sees fit, to exclude others from using the asset, and to transfer the ownership of the asset to another party. Property rights thus give the holder of the rights an incentive to invest in the underlying asset.

The incentive embedded in property rights depends on the level of individualisation of ownership of the property right. The individualisation of ownership of the property rights can be expressed along a spectrum (Herrera, 2005). Open access refers to the absence of exclusive rights (anyone can use the resource as he/she likes) and lies at the one end of the spectrum. The other end of the spectrum is private property, which gives the holder exclusive decision-making power. Between private property and open access, there are also common property and state property. Common property refers to the situation where a collective entity (e.g. a co-operative group) owns the decision-making power, while state property refers to the situation where the government has the decision-making power (Herrera, 2005). Herrera (2005) argues that the lack of individual decision-making power serves as a disincentive for an individual to invest in the underlying asset. Within the South African context, the rules and regulations associated with the land tenure systems that apply at smallholder irrigation schemes are crucially important.

Informal institutions

The informal constraints of the institutional environment include norms of behaviour, conventions, self-imposed codes of conduct (North, 1994), and non-political, non-economic and unwritten conventions such as taboos and traditions (Milagrosa, 2007). Informal institutions play a significant role in economic development in Africa. According to Chamlee-Write (1998), opportunities for promoting economic development have been missed because the cultural specificity in which institutions emerge has been ignored. Chamlee-Write (1998) concludes that more success may be achieved if policies allowing indigenous institutions to work to their full potential are advocated, instead of forcing "West African culture into the mold of Western institutions".

Informal institutions are also important as value chain influencers when considering the behaviour of smallholder farmers from South Africa. As a matter of fact, in South Africa there is a renewed recognition of the role played by traditional authorities through the traditional justice system as is evident by the tabling of the Traditional Courts Bill at the end of 2011 (RSA, 2011). It is important to keep in mind that traditional authorities are also often responsible for allocating land in communal areas (Cousins, 2008), and that insecure land tenure is also listed as a major stumbling block that contributes to the exclusion of emerging farmers from commercial agri-food chains. Ignoring the role of traditional institutions when developing programmes to facilitate the successful integration of smallholder farmers in commercial agri-food chains may lead to similar missed opportunities as referred to by Chamlee-Write (1998). A comprehensive analysis of the informal institutions will provide important insights into the role played by traditional

authorities and other informal institutions in the specific communities under consideration, and hence will enable the developers of development programmes to "allow indigenous institutions to work to their full potential" (Chamlee-Write, 1998). Such a strategy thus may increase the likelihood of success with which the programme can contribute towards the successful integration of smallholder farmers into commercial agri-food chains.

2.2.2 Structure

Structure refers to the characteristics of the market or industry that have a strategic influence on the nature of competition and pricing within the market (Allen, Reeves and Mumma, 1999). The structure component of the SCP can be separated into farm structure and market structure. Farm structure refers to the physical characteristics of the region, the distribution of land within the region, and also land ownership and tenure (Milagrosa, 2007). The characteristics of the region that are of importance include the specific location, its topography, the size of the population in the region, the proportion of the population involved in agriculture, the main crops produced in the region, and the total land area in the region. Land distribution is concerned with the number of farmers in the region, the average size of farms and also the distribution of farm sizes. Finally, farm structure is concerned with the different systems of land ownership and tenure that exist in the region under consideration. The number of farms relate to the respective tenure systems, as well as the distribution of land under the respective tenure systems (Milagrosa, 2007).

Market structure is generally concerned with the characteristics of the organisation of a market, which seem to influence strategically the nature of the competition and pricing within the market (Bain, 1951). Hai (2003) considers the degree of market concentration, the degree of product differentiation, the existence of entry and exit barriers, and the distribution of power when assessing market structure. When assessing market structure, CAET (2001) considers the different types of markets available, the different marketing channels, and all the actors involved in moving the physical product from the farm to the final consumer. Milagrosa (2007) also considers the location of the input and product markets, the market infrastructure, and the availability and condition of road networks to and from the farms.

According to the developed conceptual framework, the farm and market structure are also influenced by rules and regulations included in the institutional environment.

2.2.3 Complementarity between the institutional environment and structure

By representing the formal rules and informal constraints that regulate the way transactions are conducted (Williamson, 2000), institutions form the incentive structure of a society, and the political and economic institutions, in consequence, are the underlying determinants of economic performance (North, 1994). The structure component of the SCP, again, influences the way economic agents behave (conduct) by providing the physical environment within which the value chain players operate (CAET, 2003). The integrated approach thus allows consideration of both the physical and institutional environment in which the sectoral economic agents have to operate.

The major difference between the structure component and the institutional environment is that, while the institutional environment refers to intangible aspects (formal rules and informal constraints) (Milagrosa, 2007), structure is concerned with tangible aspects such as the region, topography, the distribution of land, land ownership and tenure, distance from input and product markets, and the road infrastructure that connects farms to markets (CAET, 2003). Within the analysis of the institutional environment, more important information will be obtained with regard to the security of tenure. The consideration of the legal aspects, and hence the constraints, associated with the tenure systems that apply is a major component of the analysis of the institutional environment. A comprehensive understanding of the existing tenure systems will contribute to an understanding of the environment in which the farmers operate, the potential for prosperous farmers to be able to expand their production enterprises by buying or renting additional land, and it can also be used in negotiations with financial organisations to possibly develop a financing product that will allow emerging farmers access to formal credit. The small scale of operations and the lack of access to credit were listed as major stumbling blocks that contribute to the exclusion of emerging farmers from participating in commercial agri-food chains. A comprehensive analysis of the institutional environment will also ensure that the farmers properly understand the regulations and requirements that have to be met when producing products to be distributed through higher value marketing channels. Thus, the application of the framework will ensure that emphasis is placed on the physical environment, the security of tenure that affects access to credit, and the stringent quality requirements associated with supplying a commercial agri-food chain. Such information will allow for the formulation of strategies that will help the group of smallholder farmers to overcome the stumbling blocks that normally constrain the successful participation by smallholder farmers in commercial agri-food chains.

2.3 Governance structures and conduct

2.3.1 Governance structures

Governance structures are often also referred to as the "play – or organisation – of the game" (Milagrosa, 2007). It is important to note that the conceptual framework allows for assessing the governance structures used to enforce the rules and regulations for the value chain players, but also for the support structures at a meso level. For the purpose of this paper, however, the focus of attention is mainly on the governance structures associated with the transaction between the farmers and their buyers. Governance structures refer to the way in which a transaction is organised within the rules and regulations as defined by the institutional environment. Williamson (1998) notes that the concept of governance is precisely responsive to the triple to which Commons (1932) referred since "governance is the means by which *order* is accomplished in a relation in which potential *conflict* threatens to undo or upset opportunities to realize *mutual* gains". Governance structures can best be described along a spectrum (Shelanski and Klein, 1995). Three types of governance structures are generally distinguished (Williamson, 1985). At the one end of the spectrum lies a purely anonymous spot market, while the other end of the spectrum consists of hierarchy or vertical integration. Between those two modes of governance lies a variety of hybrid modes such as contracts and partial ownership (Williamson, 1985; Shelanski and Klein, 1995; Peterson, Wysocki and Harsh, 2001). Figure 2 presents the spectrum of governance structures (Peterson *et al*., 2001).

Within the spot market as a mode of governance, the market price provides incentives for the exploitation of profit opportunities. Individuals can quickly and autonomously respond to market signals. The market typically will be the efficient mode of governance when the underlying transaction is concerned with low levels of asset specificity (Williamson, 1985; Shelanski and Klein, 1995). Shelanski and Klein (1995) argue that bilateral coordination or even joined ownership may be more desirable whenever more specialised assets are at stake in the transaction, or in the presence of thin product and input markets. Hierarchy, otherwise referred to as vertical integration, refers to the situation where trading parties are under unified ownership or control. The level of asset specificity plays a major role in the decision whether or not to integrate vertically. The higher the level of asset specificity, the higher is the need for vertical integration.

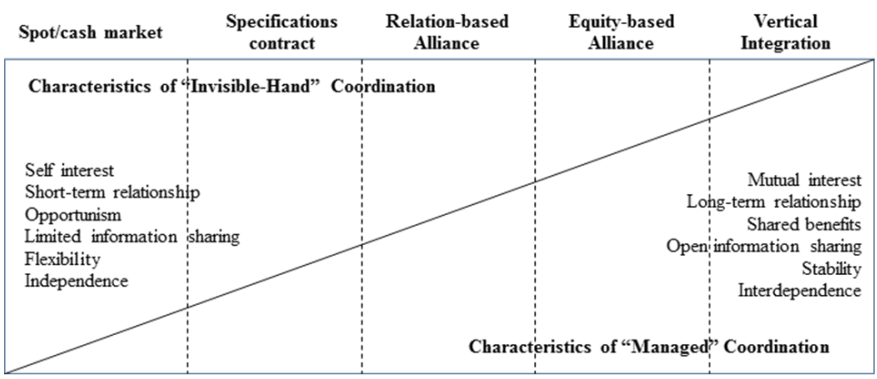

Figure 2: The continuum representing the respective strategic options for vertical coordination

Source: Peterson *et al*. (2001)

Note: The diagonal line represents the mix of invisible-hand and managed coordination characteristics found in each of the five alternative strategies for vertical coordination. The area above the diagonal indicates the relative level of invisible-hand characteristics and the area below the diagonal indicates the relative level of managed characteristics.

There are hybrid forms of organisation that deal with bilateral dependency without going so far as vertical integration. Ownership autonomy is preserved, although there are some safeguards to protect parties from opportunistic behaviour by other parties. Peterson *et al*. (2001) provide a thorough discussion of the different hybrid modes of coordination along the continuum. Specification contracts are legally enforceable establishments of specific and detailed conditions of exchange. Within relation-based alliances the firms involved in the relationship share risks and benefits that emanate from mutually identified objectives. Peterson *et al*. (2001) cite Martin *et al*. (1993), who argue that a strategic alliance is relation based if parties mutually identify objectives, mutually control the decision-making process and mutually share the risks and benefits. The next level of vertical coordination is referred to as equity-based alliances. Equity-based alliances differ from relation-based alliances through the presence of a formal organisation that has an identity distinct from the exchange actors, and that is designed to be their joint agent in the conduct of the transaction. The different types of hybrid governance structures differ mainly in terms of the intensity of control, which increases the further you move to the right in Figure 2.

The number of different modes by which a transaction can be organised emphasises the need to thoroughly assess the different modes of governance in order to identify the most efficient governance structure for the specific transaction under consideration.

2.3.2 Conduct

Conduct refers to the behaviour of the agents within the farm and market structure. Conduct, again, can be divided into production and marketing conduct (Milagrosa, 2007). Production conduct is concerned with the cropping practices of the producers under consideration, the farming techniques used, and the sources and availability of credit to those producers (Milagrosa, 2007). The conceptual framework also allows for a comprehensive analysis of the conduct of the support structures where necessary.

Market conduct, on the other hand, refers to the set of competitive strategies that a trader or a group of traders use to run their businesses (Hai, 2003). When assessing marketing conduct, the aspects to be considered include the sources and availability of market information, the method of price formation, investment in new technology, research and development of new products, investment in technical training and services, the level of competition in the market, the types of contracts that are employed, and the marketing strategies that are used (CAET, 2001; Milagrosa, 2007).

2.3.3 Complementarity between governance structures and conduct

Both the conduct component of SCP and the governance structures of NIE focus on the way in which value chain players operate within the value chain in reaction to the physical and institutional environment specified at the higher levels. The governance structures refer to the specific way in which transactions between the different parties are organised. The type of governance structure used is influenced by the institutional environment in which it was formed (Milagrosa, 2007). Conduct goes beyond the organisation of the transaction by referring also to the production and marketing behaviour of the economic agents within the farm and market structure as defined by the structure component of SCP (Milagrosa, 2007; CAET, 2003). Conduct is concerned with cropping practices, farming techniques, sources and availability of credit, the sources and availability of market information, the way prices are determined, competition and contracting, and the marketing strategies used (CAET, 2003). The major similarity between conduct and governance is that both components aim to create order in the transaction under consideration (Milagrosa, 2007).

The analysis of the governance structures is concerned with finding the optimal vertical coordination strategy that will contribute to reducing the transaction costs faced by the farmers. The review of the literature on the factors that constrain the ability of emerging farmers to participate in commercial agri-food chains shows that high transaction costs are considered to be a major barrier that exclude

emerging farmers from commercial agri-food chains. The contribution of the analysis of the governance structures thus lies in the identification of a potential solution to overcome the problem of high transaction costs that exclude the farmers from commercial agri-food chains. Given that NPC (2011) also recommends the identification of potential partners in agro-processing that can support the farmers, the optimal degree of vertical coordination that results from the analysis of governance structures will ensure that the partnership will be based on the optimal degree of coordination between the farmers and such a company, rather than merely forcing farmers into a relationship with an agro-processing company that may act opportunistically at their expense. It is also noted that the number of different types of formal relationships that can be formed between farmers and such processing companies, policy recommendations that farmers should enter into strategic partnership relationships with agro-processing companies (CRDP, 2010), may be an oversimplified solution to a very complex problem.

2.4 Resource allocation and performance

2.4.1 Resource allocation

At the level of resource allocation, market performance is evaluated with special reference to the quantities produced and marketed, production and marketing costs, and price analysis in the form of farmer's and traders' share of total market sales (Milagrosa, 2007). Resource allocation is analysed with neoclassical economic theory in the form of marginal analysis, where the firm, again, is described as a production function (Williamson, 2000) rather than a governance structure. Weintraub (undated) summarises the framework of neoclassical economics as follows: "Buyers attempt to maximise their gains from getting goods, and they do this by increasing their purchases of a good until what they gain from an extra unit is just balanced by what they have to give up to obtain it. In this way they maximise 'utility' – the satisfaction associated with the consumption of goods and services." Similar to the view from buyers, producers, again, attempt to produce respective units of a good until the cost of producing the incremental or marginal unit (marginal cost) is just balanced by the additional or marginal revenue it generates (marginal revenue). Profit is maximised at the exact level where the marginal cost equals the marginal revenue.

Neoclassical economics is thus concerned with the allocation of resources in an optimal manner, which is the level where profit and/or utility are maximised. By definition, optimal allocation of resources implies that the resources are allocated efficiently. The concept of efficiency is the most widely used concept in economics (Haji, 2008). In general it is measured by comparing the observed output with the

feasible (or optimal) output. The importance of efficiency to economics is centred around the scarcity of resources.

One can distinguish between different types of efficiency. Two important forms of efficiency include technical efficiency and allocative efficiency. The concept of technical efficiency refers to the ability of the producer to produce maximum output from given level of inputs, or to produce a given output by using the minimum feasible amount of inputs (Farrell, 1957). Essentially, the degree of technical efficiency is expressed as the ratio of the observed level of production to the optimal level of production (or the production frontier). A firm will be considered to be technically efficient only if the output produced is the maximum that can be produced from the given level of input given his technology set, or if it used the minimum possible amount of inputs to produce the current output level (Haji, 2008).

Allocative efficiency, on the other hand, measures the ability of the producer to use inputs in optimal or profit maximising proportions, given specific factor prices (Farrel, 1957; Haji, 2008). A firm can thus be considered to be allocative efficient if the combination of inputs used to produce the output lies on the expansion path. The ratio of the marginal physical products (MP_{xi} / MP_{x1}) thus should be equal to the price ratio (r_i / r_1) of the respective production inputs used to produce the product so that the condition, $MP_{xi} / MP_{x1} = r_i / r_1$, holds (Ajibefun and Daramola, 2003). A firm that does not use the expansion path combination of inputs does not operate at minimum cost and therefore is considered to be allocative inefficient. The level of allocative efficiency of a firm is expressed as the ratio between the minimum possible costs to produce the output to the incurred costs. The larger the difference between the incurred costs and the minimum costs, the lower is the allocative efficiency ratio and hence the degree of allocative efficiency (Van der Merwe, 2012; Ozkan, Ceylan and Kizilay, 2009).

Given the definitions of the concepts of technical and allocative efficiency, if a firm has achieved both technical and allocative efficiencies, it may also be considered to be economically efficient. Alene (2003) argues that technical efficiency and allocative efficiency are important in developing countries, since increasing technical and allocative efficiencies are important factors of productivity growth.

2.4.2 Performance

The study of performance deals with the state of reality that is achieved (CAET, 2001) and refers to economic results (Hai, 2003). The performance component is concerned with the actual volumes of the respective crops that were produced, the sales, costs and income earned by the respective agents along the value chain,

and also an analysis of the marketing margins (CAET, 2001; Milagrosa, 2007). A marketing margin is the difference in the price paid for the product at different stages along the value chain (Tomek and Robinson, 1990). The marketing margin thus includes costs such as packaging, transport and storage of the product under consideration.

The conceptual framework also captures the link between the resource allocation level and performance. The degree of efficiency with which production inputs are used has a direct influence on the performance of the farmers under consideration.

2.4.3 Complementarity between resource allocation and performance

The similarity between the resource allocation level of NIE and performance of SCP is that both are concerned with measuring the efficiency of the behaviour of the agents within the social, physical and institutional environments as determined in the higher levels of the integrated framework. Both components are concerned with prices, margins, and costs. The performance of value chain players is expressed in terms of quantities produced, the value of sales, costs, and also the margins at the different stages along the value chain (CAET, 2003). Resource allocation is concerned with marginal analysis to analyse productive and allocative efficiency (Milagrosa, 2007).

The analysis of the resource allocation level is concerned with the degree of efficiency with which resources are used. While NPC (2011) recommends that the focus of research and development for the agricultural sector has to be on new technology due to the historical benefits associated with the ability to adapt highly sophisticated technology to South African conditions, it has to be recognised that emerging farmers typically exhibit low levels of human capital and financial capital required to adopt sophisticated new technology. The focus of research and development efforts only on sophisticated new technology may mean that emerging farmers do not benefit from investment in research and development. Moreover, cash flow constraints due to the lack of access to credit contribute further to the inability of the farmers to apply the recommended levels of production inputs to produce optimum yields. Efficiency analysis provides valuable insight into the degree to which farmers should be able to improve their performance at their current input levels, and within their current technology set. Thus, while most of the stumbling blocks are caused by the very nature of being start-up farmers, or relate to institutional failure, efficiency analysis shows the potential for improvement even in the presence of existing constraints.

3 CONCLUSIONS

Given the scope of the stumbling blocks that normally constrain the operations of smallholder farmers in commercial agri-food chains, and the common factors present in the few success stories where smallholder farmers from South Africa are participating in commercial agri-food chains, it is evident that a holistic approach is required in endeavours aimed at integrating smallholder farmers into commercial agri-food chains. The integrated VC-NIE-SCP framework that was developed in this paper allows for such a comprehensive analysis of the value chain under consideration. In addition to those role-players directly involved in the transformation of the physical product (value chain players), the conceptual framework also considers the institutional environment that influence the behaviour of the value chain players, and the supporters who support the value chain players to meet the regulations specified by the influencers. The integration of the NIE-SCP framework into the value chain framework allows for an extended analysis of the value chain influencers by also considering the impact of the social, physical and market environment on the behaviour of the value chain players. By considering the social environment, together with the formal and informal institutions, the framework allows for a comprehensive analysis of the existing incentive structure that affects the behaviour of the farmers and other role-players. The emphasis on the formal institutions also ensures that important information is gathered on the rules and regulations that have to be met by farmers when supplying commercial agri-food chains. The focus on the physical and market environment as additional value chain influencers ensures that significant attention is paid towards the suitability of the physical and market environment to allow the successful participation by the particular smallholder farmers in the specific food chain.

The developed framework also allows for a comprehensive analysis of the relationship between the farmers and their buyers. Given the potential contribution of vertical coordinated relationships between smallholder farmers and their buyers, the emphasis on the relationship between the farmers and their buyers allows for the selection of the vertical coordination strategy that will minimise the transaction costs for the farmers and their transacting partners. In addition to minimising the transaction costs, the farmers may also benefit from the embedded services normally associated with vertically coordinated relations. A proper analysis to select the optimal type of vertical coordination strategy thus may contribute substantially towards the level of success with which smallholder farmers participate in commercial agri-food chains.

The emphasis on the current levels of performance and the efficiency with which the farmers use their production inputs also ensure that significant attention is attributed towards improving the performance of the farmers, even under current

conditions (i.e. existing technology set). Thus, rather than having to wait for a change in the environment to manifest into improved performance, the application of the framework may contribute towards increased production levels still under current conditions. By helping the farmers to increase their production levels, the farmers are helped to improve their ability to more consistently supply produce to commercial agri-food chains, and consequently decrease the transaction costs faced by their buyers.

From the above discussion it is evident that the integrated value chain and the NIE-SCP framework have some major advantages with great potential to identify key success factors that may contribute to the successful integration of smallholder farmers into commercial agri-food chains, and hence to meeting the vision for 2030 of the NPC of South Africa. The high levels of similarity, combined with some distinct differences between the two approaches, lead to the conclusion that the integrated framework allows for a more comprehensive analysis of the value chain under consideration. Given the complexity in South Africa, which exhibits two distinct economies that developed in different social and institutional environments, such an integrated research framework may contribute substantially to providing a comprehensive understanding of the agri-food systems within which smallholder farmers are to be integrated. The information that is gathered through the application of this framework will be of substantial value when developing a strategy to integrate smallholder farmers into an existing commercial agri-food chain.

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