

Chain Failure and Chain Goods: Re-thinking Value Chain Upgrading and Promotion in Developing Countries *

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ABSTRACT

The concept of value chain upgrading and promotion has been proposed as a vehicle for small-holder farmers in developing countries to gain access to higher value markets and thus generate greater income for their families and communities. However, there are many instances where investments in upgrading have not generated the expected outcomes. One of the contributing factors has been that existing approaches focus more on who does what rather than the real problem to be addressed. A chain failure framework on the other hand focuses attention on the core problem and the appropriate response, rather than on who does what. It takes a system view rather than a function or component view, and it starts from the supposition that the only reason for intervening in a value chain is to increase chain surplus, where chain surplus is properly measured to include any chain or social externalities. In this paper we review some of the existing literature on value chain upgrading and promotion as proposed for developing country situations, outline the essential elements of the chain failure/chain good theory and its relationship to the club goods literature, and then assess whether the chain upgrading and promotion literature can be reconfigured as a chain failure/chain good problem, using a number of published case studies. Finally, we discuss various types of governance models used in agricultural value chains in developing countries and suggest how well they might align with the chain failure/chain good approach.

Keywords: *chain upgrading; chain failure; chain goods; chain governance*

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1 Introduction

The concept of value chain upgrading and promotion has been proposed as a vehicle for small-holder farmers in developing countries to gain access to higher value markets and thus generate greater income for their businesses, their families and their communities (UNIDO 2011, FAO 2014, OECD et al. 2014, Taglioni and Winkler 2016). It is the accepted approach in almost all international development institutions. As well as increasing economic growth and trade flows, there is often an explicit focus on the role of upgrading and promotion in ameliorating and reducing poverty, so public policy is an issue in such proposals (Mitchell 2011). However, there is growing worldwide concern about large food production, processing and retailing firms forming private, closed-loop value chains and networks, and the consequent lack of transparency of value chain outcomes to public policy scrutiny (Griffith et al. 2015). For example, there is an extensive literature on the growing presence and impact of global supermarket chains in developing countries. Under such conditions, the ability of industries or even governments to protect and promote competitive food markets, and to alleviate poverty, has been questioned.

Since value chain outcomes fall between public and private good outcomes, there has been confusion about which theoretical frameworks to use to analyse such problems. We have developed a different way of analysing food value chains that complements the existing public finance theory. This relies on concepts of chain failure (inefficiencies or impediments that prevent maximisation of value chain surplus), chain externalities (unpriced spill-overs and spill-ins across the value chain boundaries) and chain goods (goods and services that are collectively provided for the whole chain that ameliorate chain failure or internalise chain externalities) (Griffith et al. 2015, Fleming et al. 2015). These concepts provide new ways to analyse the performance of food value chains. Some limited validation of these concepts has been undertaken for the Australian beef and wine industries (Grant et al. 2013, Mounter et al. 2016), but if the concepts are to be globally relevant they need to be tested across a range of different industries and different institutional, policy and consumer environments.

In this paper we review some of the existing literature on value chain upgrading and promotion as proposed for developing country situations, outline the essential elements of the chain goods/externalities theory and its relationship to the club goods literature, and then assess whether the chain upgrading and promotion literature can be reconfigured as a chain good/externality problem using a number of published case studies.

2 Existing literature on value chain upgrading in developing countries

2.1 The older value chain toolkits

Value chain upgrading and promotion is defined slightly differently in many of the resource toolkits (see for example Kaplinsky and Morris 2001, Springer-Heinze 2007, DFID 2008, Agrifood Chain Toolkit 2016). Many of these toolkits have an explicit focus on pro-poor development.

The definition from the *ValueLinks* manual (Springer-Heinze 2007, p. 77) is as follows:

“Formulating a strategy to develop a value chain always has two dimensions. The first concerns what the actors in a value chain must do to become more competitive and to generate greater value added in the future. The joint improvement of the value chain by private enterprises and their associations is called “value chain upgrading” in the remainder of this manual....The second dimension of strategy concerns the role of external facilitators, i.e. government and donor agencies running an economic development programme. External facilitators do not engage in upgrading directly. Rather, they facilitate upgrading and provide assistance without becoming chain actors themselves. This activity is called “value chain promotion”, and logically refers to the upgrading strategy pursued by the operators”.

The *ValueLinks* manual (p.79) goes on to talk about an upgrading vision, which refers to the overall goal of chain development in the interest of operators.

“Thus, the vision always refers to

- improving chain revenue (value creation), i.e. generating a higher sales volume and/or achieving better prices, and
- the income of chain operators (value capturing)”.

However, the way it is explained is still about chain operators improving what they are doing, usually by adopting new technology relevant to their particular functional area, with the longer term (and secondary) goal of increasing chain revenue.

The *M4P Toolbook* (DFID 2008, Tool 5, pp.73-88) splits the concept of upgrading into three parts: process upgrading (improving the efficiency of production); product upgrading (introducing new products or improving old products); and functional upgrading (deciding which activities the actor in the chain should concentrate on). Of 15 key questions to be answered when analysing options for demand-driven upgrading, it is not until question 13 that proponents are asked: "is investment in upgrading worthwhile? does it bring enough added value to the poor?"

In the section on identifying opportunities for upgrading, there are the following two quotes (p.83) "In the search for upgrading possibilities it is important to look at the effect of the upgrade on the whole value chain", and "In order to improve the performance of the whole value chain it is important to determine the most effective level in the value chain to upgrade."

While there are these statements that upgrading should be assessed on a whole-of-chain basis, most of the discussion in this Tool is about specific technologies. It is only towards the end that there is any discussion of the types of services required to support an upgrading push (chain promotion) and little discussion of coordination mechanisms or governance requirements to ensure that upgrading is effective in meeting development objectives.

2.2 Examples of ineffective upgrading

There are numerous instances where an uncritical following of the narrow concepts of upgrading has not produced the desired outcome. For example, in the South African wine industry, Ponte and Ewert and colleagues (Ponte 2007, Ponte and Ewert 2009, Ewert and Hanf 2015) show that a better industry outcome does not necessarily follow from a higher value added. They argue that two issues may circumvent any upgrading strategy. First, value chain actors need full knowledge of the underlying market segments and their requirements. For example, "...upgrading activities have co-existed with demands for higher volumes of basic quality wines and hence increasing demands for bulk delivery instead of packaged wine. As the marketing of bulk wine results in lower marketing costs, and higher yields can be achieved with lower quality grapes, overall profits have been better than the ones resulting from traditional upgrading activities." (Ewert and Hanf 2015, p. 4).

Second, the chain governance structure is most important. Upgrading into design, marketing and branding (to back up technical quality improvement) might be hindered if the chain is governed by a multinational enterprise (or its agent). Such enterprises have no interest in transferring these core skills to their suppliers, thus preventing them from accessing global markets (except as a raw material supplier for their first world customers (Ewert and Hanf 2015, p. 3))². These authors then use a number of case studies of South African wineries to assess the role of governance structure and the influencing strategies used by the customers to shape various decisions about upgrading.

Another case of at least partial failure is the investment in the upgrading of the Kenyan green bean value chain. The industry has invested considerable sums in product development and diversification and quality control systems to meet the requirements of high value export markets. There has also been a large investment in marketing (World Bank 2005). However, the expected higher unit values have not materialised and the industry has received low prices in the international market. Product specifications have become much more stringent than expected with a tight focus on phytosanitary standards, pesticide residues and any form of contamination (FPEAK 2013).

Even though Kenya has preferential tax-free access into the European Union (EU), the EU entry standards are strictly enforced. This results in significant inspection delay which quickly diminishes product shelf life. Industry bodies claim that of vegetable exports exported to the EU in January 2013, one fifth was rejected at the point of entry due to pesticide contamination (FPEAK 2013). In addition, some of the importing companies (supermarkets) require even more quality attributes (freshness, special product treatments, added declarations, etc.). Obviously, the upgrading investment into product development has not been matched by other required investments in raw material quality processes. It is claimed that about 5,000 small scale Kenyan farmers have given up on green bean production and switched to other enterprises. Gachukia (2016) points to failures in governance arrangements as a strong contributing factor to the lack of success from the upgrading investment in this value chain.

² See also the similar discussion in Humphrey and Schmitz (2000).

There are many other similar examples that can be reviewed. Fromm (2007) reports the results from a sample of more than 100 smallholders across three different industries in Honduras. Most had adopted some form of process or product upgrading, but only a few had adopted either functional upgrading or chain upgrading. Process and product upgrading are usually thought of as improvements in the farm production system, and as such are relatively easy to adopt if profitable; improvements in the post farm gate part of the value chain are much harder for producers to undertake as there is often no mechanism for the benefits which accrue higher up the chain to be transmitted back to producers. This requires whole of chain investments.

2.3 The newer value chain literature

More recent publications have started to move away from the narrow definitions of value chain upgrading. For example, Baker et al. (2016), Bokelmann (2015), Trienekens (2011), Mitchell (2011) and Mitchell et al. (2009) among others are explicitly calling for the question of value chain upgrading to be thought of as a system problem and to require a value proposition. For example, Mitchell et al. (2009) propose a broader menu of seven different upgrading strategies, and highlight some key conditions for success including “clarity on the rationale for the (possible) intervention”, and “rigour in applying research methodology”. In explaining the latter point, they note (p.4) that “Value chain analysis and development requires robust evidence-based research of the current market system and a clear appreciation of which blockages poor people can overcome and how”.

Other writers highlight the requirement for not only vertical investments in the commercial chain but also (and concurrently) horizontal investments in the enabling conditions, particularly coordination mechanisms and governance structures. Giuliani et al. (2005, p. 550) argue that successful upgrading by individual firms depends on both the collective efficiency of the regional cluster in which the firm operates, and the pattern of governance of the corresponding value chain.

An excellent summary of this current thinking is provided by FAO (2014, pp. viii-ix), with their 10 principles of Sustainable Food Value Chain Development (SFVCD):

“The approach is not about simply developing long lists of often well-known constraints and then recommending that they be tackled one by one. Rather, SFVCD takes a holistic approach that identifies the interlinked root causes of why value-chain actors do not take advantage of existing end-market opportunities.

The ten principles are grouped in three phases of a continuous development cycle. In the first phase, measuring performance, the value chain is assessed in terms of the economic, social and environmental outcomes it delivers today relative to a vision of what it could deliver in the future (Principles 1, 2, and 3). SFVCD programmes should target value chains with the greatest gap between actual and potential performance.

In the second phase, understanding performance, the core drivers of performance (or the root causes of underperformance) are exposed by taking three key issues into account: how value chain stakeholders and their activities are linked to each other and to their economic, social and natural environments (Principle 4); what drives the behaviour of individual stakeholders in their business interactions (Principle 5); and how value is determined in end markets (Principle 6).

The third phase, improving performance, follows a logical sequence of actions: developing, based on the analysis conducted in phase 2, a specific and realistic vision and an associated core value chain development strategy that stakeholders have agreed upon (Principle 7), and selecting the upgrading activities and multilateral partnerships that support the strategy and that can realistically achieve the scale of impact envisioned (Principle 8, 9, and 10).”

Note that these principles attempt to synthesise both the economic development motive (second phase) and the pro-poor development motive (third phase).

Although we fully support the sentiments expressed in these recent writings, we prefer to formalise these suggestions for change by using a value chain failure framework. Thus we prefer to start from the outcome of chain surplus and ask whether chain surplus is at the maximum or not and if not, why not. Chain upgrading and promotion is then a response to an impediment in the chain, not whether a particular new technology or process is available. Further, we are less concerned about who does it and more concerned that it is the right response for the specified impediment. Our definition of value chain upgrading follows from Porter (1990), Humphrey and Schmitz (2002) and Giuliani et al. (2005) that it is “the capacity of a firm to innovate to increase the value added of its products and processes”, that is, to add to chain surplus. Such innovation can take a wide variety of forms and may occur anywhere in the

value chain.

3 Elements of the chain goods theory and its relationship to the club goods literature

The impediment in the value chain preventing the achievement of maximum chain surplus is what we call chain failure.

The concept of chain failure is analogous to that of market failure used widely in the microeconomics literature, namely a situation of economic inefficiency caused by market imperfections. Economic efficiency is a concept normally applied to a national economy but can be adapted to smaller economic systems such as value chains.

Hence, we define chain failure as a situation in which a value chain fails to maximise chain surplus because it supplies a suboptimal level of throughput and value: at least one chain participant can be made better off without another participant being made potentially worse off. It can be determined by ascertaining where chain economic surplus (the sum of consumer surplus and producer surplus) is at a maximum. If we ignore equity concerns, the degree to which chain economic surplus is less than its potential maximum value shows the extent of chain failure. In principle and with data permitting, we could measure this by using concepts of whole-of-chain isoquants and iso-cost curves, and whole-of-chain production possibilities and iso-revenue curves (Mounter et al. 2016). Chain failure can occur as a result of the absence in the value chain of chain goods, or the presence of chain bads, positive and negative chain externalities, or asymmetric information leading to adverse selection, moral hazard and the principal-agent problem. It can also arise from the many forms of market failure originating from outside the value chain.

The concept of a chain good from a theoretical point of view can be considered as analogous to a club good where the club comprises all members of a value chain (Sandler 2013). A club good is a sub-type of a public good, and populates the space between a public good and a private good. A reason for the importance of this theory is that club membership size is an endogenous choice related to the decision to provide a shared good. But a decision to pay for 'membership' is not always a purely endogenous choice because often the decisions to engage in the governance of a value chain and to set a fee to pay for this governance are made by an outside party, often a supranational, national, regional or local government.

Non-excludability and non-rivalry in consumption are the criteria applied in assessing whether a good can be described as a public good. Non-excludability means if one person consumes a good, other people cannot be excluded also from consuming it. Non-rivalry in consumption means that one person's use of a good does not diminish its availability to other consumers. A pure public good is both non-rival and non-excludable; conversely, a pure private good is both excludable and rival. Club goods (and therefore from our viewpoint, chain goods) are essentially public goods with selective excludability.

Thus chain goods are those types of goods and services that are collectively supplied and allow effective coordination across value chain partners. They resemble what used to be called the facilitating functions of agricultural markets. These functions make possible the smooth performance of the exchange and physical functions and are not directly involved in either the exchange of title or the physical handling of products. However, without them the modern marketing system would not be possible. The four key groupings of facilitating functions – standardisation, financing, risk-bearing, and market intelligence – have to be collectively or jointly supplied.

We define a negative chain externality as a cost incurred by a participant in the value chain that is imposed on a third party who is not directly engaged in producing, trading in or consuming the good causing the cost, but this participant does not compensate the third party for bearing the cost. We define a positive chain externality as a benefit received by a third party who is not directly engaged in producing, trading in or consuming the good providing the benefit, but this third party does not compensate the participant in the value chain who provides the benefit.

A study of chain externalities rests on the analytical framework used to study chain goods, in that chain goods may be treated as extreme cases of goods with positive chain externalities. Alternatively, chain bads may be treated as extreme cases of goods with negative chain externalities. When a unit of a good is produced or consumed that beneficially (adversely) affects third parties but entails no market transaction, a positive (negative) externality occurs. When this production or consumption beneficially (adversely) affects *everybody* in a given population (in our case, chain participants), the good or service has chain good (bad) characteristics. While these conditions suggest we could simplify discussions by referring simply to positive and negative chain externalities that subsume chain goods and bads,

respectively, another condition suggests that this approach is unwise. Public goods (bads) do not have a market because it is beneficial to nobody to provide (eliminate) them, whereas chain externalities typically but not always occur in situations in which markets operate, albeit imperfectly from the chain's and/or society's viewpoint. Hence, the economic analysis of these concepts will differ.

The existence of negative or positive externalities among participants of a value chain too can be explained in terms of the size of the transaction costs of individuals acting to reduce negative externalities or to supply more of something which has positive externalities. It may be that only by acting jointly can the transaction costs per individual be reduced sufficiently relative to the individual's share of benefits that it warrants something that causes a negative externality being reduced or a positive externality being supplied. The cost of making the joint effort is the fee associated with club good membership.

If we wish to apply these concepts in practice we will need to consider the whole network of organisations and value-producing activities involved in the production and delivery of an offering to the end customer. In this situation, chain failure occurs if there is a lack of or a poorly performing network good, and positive and negative chain externalities refer to a participant in this particular network of firms. An example of chain failure might be the lack of a uniform and credible product description scheme for beef (Griffith et al. 2015).

4 Reconfiguring chain upgrading as a chain good/externality problem

The provision of chain goods and the internalisation of chain externalities that increase chain surplus can be viewed as forms of market innovation. There is therefore a direct link with value chain upgrading and promotion, which we have defined above as innovation to add value in a chain. Further, following the arguments of Mitchell et al. (2009), taking a chain failure approach automatically provides "robust evidence-based research of the current market system and a clear appreciation of which blockages poor people can overcome and how." Consider some examples of the provision of a chain good and internalisation of positive and negative chain externalities.

Examples of chain goods are merit goods, RD&E, and chain-wide standards and certification. Merit goods are of special interest to policy makers in developing countries because they are socially beneficial regardless of consumers' preferences. That is, the social benefit of consumption exceeds the private benefit. Three key questions on merit goods from a food value chain perspective are: what qualifies as a merit good, how should merit goods be paid for, and should they be supplied through the public or private sector? Merit goods abound in food value chains, associated with the social benefits from the availability and affordability of foods that most contribute to a good diet, health, food safety, a sustainable environment and greater equity. The growing consideration of human health outcomes from agricultural R&D investments is a recognition of the role of merit goods. Training provided within a value chain might also be classed as a merit good.

RD&E is commonly viewed as a public good where it does not pay an individual or firm to undertake the research and its benefits flow to people throughout society. The outcomes of some RD&E activities are worth undertaking by chain participants so long as their net benefits are positive, even if some benefits flow to individuals and firms beyond the chain boundaries.

Examples of positive chain externalities are uniform grading or classification schemes (and associated indicators of product quality), and facilitating information and knowledge flow along the chain. The presence of uniform grading or classification schemes in food value chains is an example of a positive chain externality. It may not pay an individual chain participant to introduce such a scheme but all participants could benefit from it if it was jointly developed and implemented. Facilitating information and knowledge flow along the chain adds value by enabling consumers to match their demands better to goods and services supplied in the chain.

Examples of negative chain externalities are practices undertaken in a food value chain that damage the environment, and actions by one or a few chain participants that damage the reputation of the products and firms within the chain. It is worth chain participants as a group undertaking actions to reduce or eliminate these negative externalities so long as the net benefits to them are positive, even if some benefits of their actions spill over to individuals and firms beyond the chain boundary.

Each of these scenarios may be considered to be examples of chain failure. By taking this perspective, we focus attention on the core problem of sub-optimal level of chain surplus. This focus forces us to consider all of the elements of chain surplus – the efficient combination of inputs used; the efficient combinations

of outputs supplied; and the efficient matching of the costs of acquiring inputs and the revenues from marketing outputs. The traditional chain upgrading and promotion perspective on the other hand, considers only part of the puzzle, and as we have shown above, there are many instances where recommendations for investments in upgrading and promotion have been made without any consideration of the impacts on chain surplus.

4 Forms of governance of food value chains: theoretical consistency with the chain failure/good/externality approach

One of the key factors facilitating a chain failure perspective is the governance in the value chains of interest (Guiliani et al. 2005). Here, we discuss various governance models used in agricultural value chains in developing countries and suggest how well they might align with the chain failure/good/externality approach. This extends the typology of governance structures put forward by Humphrey and Schmitz (2000) for example.

Statutory marketing authority model: a top-down approach whereby the government both regulates and undertakes marketing activities throughout the chain. Such a model has a poor track record that crowds out innovation, limits the ability to anticipate and respond to changes in market conditions, and breeds inefficiency throughout the chain. It is theoretically inconsistent with the chain good/externality approach as there is no allowance for independent actors in the chain who have an incentive to maximise chain surplus.

Cooperative marketing model: a bottom-up approach whereby producers voluntarily form a cooperative to undertake marketing activities throughout the chain. Again, such a model generally has a poor track record in developing countries for all the usual reasons why cooperatives struggle to maintain profitability and little pressure to innovate, but has had some success in developed countries where innovation has been prominent. New types of cooperative business models are being applied. It is theoretically consistent with the chain good/externality approach in part because it allows for some internalisation of externalities and provision of public goods but does not cover all chain participants.

Endogenous model of independent actors: an approach closely aligned to the club goods literature where independent actors in the value chain initiate a club for joint action. There is considerable pressure to innovate but it is difficult to initiate without external pressure. It is theoretically consistent with the chain good/externality approach. Examples include horizontal and vertical alliances.

Exogenous model of independent actors: this approach is also aligned to the club goods literature where the government regulates for levies to be collected to fund joint action by independent actors in the value chain. It has been successfully introduced into a number of food value chains in Australia with strong pressure from government to innovate, but raises a number of questions about how to ensure success can be sustained over the long term, as there are sometimes significant inequalities in who pays and who benefits. It is theoretically consistent with the chain good/externality approach.

Endogenous leadership model: in this approach a dominant organisation in the food value chain takes the lead in integrating marketing activities throughout the chain, as best exemplified by the actions of supermarkets. This can be an efficient approach but prone to displays of excessive market power, and mixed evidence on innovation (subject to incumbency inertia). It is in part theoretically consistent with the chain good/externality approach in that the leading firm(s) may internalise some externalities.

Fully integrated corporate model: in this approach a private firm (e.g. supermarket) controls activities throughout the chain, including specifications given to food producers. This can be an efficient approach with strong control of product quality but prone to displays of excessive market power, and mixed evidence on innovation (subject to incumbency inertia). It is theoretically inconsistent with the chain good/externality approach in that chain goods are aligned with private goods and the firm has the capability to internalise all chain externalities.

Aid model: a mixed model similar to the exogenous model of independent actors but funding comes from aid sources to implement activities for local chain participants and provide them with training and resources. It is prone to the criticism that chain participants revert to the old ways when the aid funding runs out. A variation on this is that donors do not directly implement activities for local chain participants but instead provide them with training and resources so that they can test ideas about what works best and is profitable to adopt, with the longer term objective that the local chain participants take over when the funding runs out. Both versions are theoretically consistent with the chain good/externality approach.

5 Concluding comments

We argue in this paper that club goods theory can be effectively applied to food value chains in developing countries to assess and improve their performance. Application of the theory enables governments to make informed decisions on whether or not to intervene in these chains in particular circumstances and, if they are to intervene, where and how they can have optimal effect. It also provides guides as to the choice of optimal size of “clubs” in the chain, the use of fees to belong and at which level, the best form of their governance, and who is likely to join.

Therefore, decisions on chain upgrading and chain promotion can be reconfigured under the broader framework of value chain failure/goods/externalities. Using the chain failure framework focuses attention on the core problem and the appropriate response, rather than on who does what. It takes a system view rather than a function or component view, and it starts from the supposition that the only reason for intervening in a value chain is to increase chain surplus, where chain surplus is properly measured to include any chain or social externalities such as motives for pro-poor development.

Chain governance models are seen to be a key critical success factor for the creation of additional chain surplus in developing country food value chains, and an appropriate governance model is crucial to the success of any chain upgrading investment.

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