

Achieving Coordination in Agricultural Value Chains: The Role of Lead Agents and Multi-stakeholder Platforms

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Abstract

Value chains (VC) have become increasingly prevalent instruments through which smallholder farmers link to markets and potentially overcome market failures and government deficiencies that constrain their competitiveness. With multiple agents involved in the VC, coordination is important to invest in club goods and complementary private investments, engage in resource providing contracts, acquire shared competencies, and achieve high quality standards. Coordination can be facilitated by development agents and enhanced by increased payoffs from coordination and increased beliefs in coordination behavior. Coordination can be achieved through lead agents in the VC, either top-down by large commercial firms or bottom-up by producer organizations. It can also be achieved by multi-stakeholder platforms, either self-sustaining or prodded by public agencies and NGOs. We show through case studies that these multiple paths to coordination are indeed feasible.

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Abstract

Value chains (VC) have become increasingly prevalent instruments through which smallholder farmers link to markets and potentially overcome market failures and government deficiencies that constrain their competitiveness. With multiple agents involved in the VC, coordination is important to invest in club goods and complementary private investments, engage in resource providing contracts, acquire shared competencies, and achieve high quality standards. Coordination can be facilitated by development agents and enhanced by increased payoffs from coordination and increased beliefs in coordination behavior. Coordination can be achieved through lead agents in the VC, either top-down by large commercial firms or bottom-up by producer organizations. It can also be achieved by multi-stakeholder platforms, either self-sustaining or prodded by public agencies and NGOs. We show through case studies that these multiple paths to coordination are indeed feasible.

1 Introduction

Linking smallholder farmers to markets is the central instrument for poverty reduction and agricultural growth in development agencies such as IFAD and USAID (Feed the Future). This requires their inclusion in value chains that must not only exist and be inviting of smallholder farmer participation, but also be organized in such a fashion as to permit their competitiveness. Yet, competitiveness is often hampered by market failures and deficits in government services. Market failures specific to smallholder farmers include credit constraints, lack of access to risk-reducing instruments such as insurance, lack of economies of scale in transacting on markets, constraints in accessing information, and high transaction costs in accessing markets. Deficits in government services include lack of infrastructure such as roads and market facilities and lack of quality recognition on markets in particular phyto-sanitary norms and standards. Civil society also shows deficits such as in-existence of effective producer organizations and cooperatives. The result is the well-known lags in technology adoption (improved seeds and fertilizers for staple crops), agricultural transformation (shift to high value crops and livestock with better-filled labor calendars), and rural transformation (development of income opportunities in a local rural non-farm economy) that characterize much of SSA and SA in spite of the potentially important role of agriculture for development in these regions of the world. Market failures, government deficits, and civil society weaknesses thus result in lack of development of inclusive value chains and lack of poverty reduction and growth opportunities in rural areas. Coordination among the multiple agents in a value chain (from input suppliers, to farmers, traders, processors, distributors/exporter, and consumers) could be used to overcome market failures and compensate for government deficiencies. While

potentially rewarding, coordination is difficult to achieve in view of the multiplicity of agents engaged in the value chain. Achieving success in coordination, i.e. in managing value chain governance, is what we explore in this paper.

Coordination is costly and consequently requires that the agent incurring the cost of coordination be able to internalize enough of the benefits of coordination to cover the costs incurred. There are two ways in which this can be achieved. One is if a lead agent in the value chain appropriates enough of the gains from coordination that it is worthwhile for this agent to assume the costs of coordinating. This can be a downstream firm, typically an exporter or a large processor with monopsony power over the value chain. In this case, the cost of monopsony power for the other agents in the chain may be compensated by the benefits of coordination. It can also be an upstream agent such as a cooperative that also appropriates enough of the externalities from coordination. In this case, producers may appropriate both the benefits of market access and of coordination.

The other approach to coordination is through a multi-stakeholder platform. Such a platform, sometimes also called innovation platform, is designed to bring together the various relevant actors in (or connected to) a market, such that they can coordinate to address the problems that are stopping smallholder producers and downstream firms from trading efficiently in situations where these problems cannot be solved in the short-run with a simple two-party agreement or contract. Depending on the context, various sets of actors will be involved based on the nature of the issues leading to coordination failure and the willingness of market players to participate.

Organizing these actors and physically getting them to meet can be costly. For this reason, we often don't see multi-stakeholder platforms forming "organically." In some cases, an NGO that is providing funding takes on the role of facilitator to get market agents in the same room and initiate the coordination process. Theoretically, we can think of the facilitator's role as providing a "big push" which incentivizes various supply chain actors to get together to solve problems by temporarily subsidizing the upfront costs associated with initiating coordination activities. In line with the Big Push theory, it is not expected that the intervention lasts forever; usually the facilitator provides short-term leadership and funding in the hope that supply chain actors will form a self-sustaining relationship. For this to be the case, the platform needs to be able to overcome (at least some of) the problems that led to lack of coordination (such that coordination becoming profitable and believable), as well as build the relevant institutional infrastructure within the platform itself to achieve sustainability. In practice, multi-stakeholder platforms have had mixed success, in that some are able to help overcome the initial issues and create a profitable upgraded value chain, while others need continued support and collapse when facilitators withdraw their support.

In this paper, we examine agricultural value chain development involving smallholders, carefully exploring the underlying market failures and government deficiencies that limit development and can be addressed with coordination. Specifically, we explore attempts, both successful and unsuccessful, at solving these failures using a lead agent or a multi-stakeholder platform approach to coordination. As there is an inherent difficulty in doing a rigorous scientific analysis of the effects of such multifaceted programs (which are not brought to a value chain randomly), we use a qualitative approach, contextualizing various cases in terms of economic theory, and trying to define the link between initial market failures and government deficiencies, coordinating activities, and final outcomes. To do so, we review the existing literature on value chain coordination and present nine case studies. These nine are chosen to be broadly representative of the literature, capturing its diversity in the sources of the initial coordination failures and in post-platform market governance outcomes.¹

¹Sources referenced for each case used are acknowledged at the beginning of each case study (at the end of the title). See

Additionally, we create a typology of these case studies in terms of the market governance structures that result at the conclusion of initial program activities.

The rest of the paper proceeds as follows. Section 2 reviews some basic theory behind coordination failures, and attempts to conceptualize both the problem and the reason why a multi-stakeholder platform may provide a solution. Section 3 explores nine case studies displaying examples of multi-stakeholder platforms. In each, we will examine (1) the causes of the original coordination failure leading to the development of the platform, (2) the stakeholders involved in the platform, (3) the solutions implemented, and (4) the overall degrees of success in both meeting program objectives and being able to sustain market relationships after the initial construction of the platform. Section 4 attempts to categorize various case studies based on the final governance arrangements that result after major platform activities are completed, and analyze the underlying reasons these outcomes arise. Section 5 briefly discusses policy implications and concludes.

2 Theory: Coordination Failure and the “Big Push” Provided by Facilitators

Our goal in this section is to model and understand the interaction between key actors in a given value chain (smallholder farmers and final goods processors), and specifically their decision to engage in value chain upgrading.² To fix ideas, consider there being some potential costly investment that value chain actors can undertake to help overcome some of the various market failures and government deficiencies mentioned above. As it is a public good for the agents of the value chain, we refer to it as a club good. This investment is not profitable for a single value chain player to invest in if the other player does not invest in it as well. Hence for this club good investment to be profitable, both producers and processors need to coordinate and invest together. Examples of such costly investment could be adoption of a new production technique to enhance quality, development of a new consumer good, creation of a more efficient contracting structure among value chain agents, or investment in infrastructure for the value chain such as storage and market facilities.

This situation can be modeled as a game theoretic coordination game, also called “stag hunt” and “assurance game.” [18] [1] To understand the basic idea, consider the two-player matrix presented in Figure 1. Each player can either choose to coordinate with the other player and invest in the costly technology or not to do so, and will face the associated payoffs in the matrix (the first value in each pair is the processor’s payoff and the second is the producers’). We assume that $a > b > d > c$ and $a' > b' > d' > c'$. Note that we are not requiring that the payoffs from coordination be symmetric for both parties. Critically, the equilibrium where both producers and the processor coordinate and the equilibrium where neither coordinates are both Nash equilibria, yet the full coordination equilibrium Pareto-dominates the no coordination equilibrium.

The reason why we often see value chains end up at the “neither party coordinates” equilibrium is that given the multitude of problems leading to coordination failure, there is often not enough confidence that the other side will be willing and able to participate in value chain upgrading (in other words that it will choose to coordinate). For example, final goods processors may not think that smallholder farmers will be able to

the Appendix for a reference list of documents containing the case studies that were considered for possible selection.

²Smallholder farmers and a processor are just one example of a pair of value chain actors. However, this framework can also describe the interaction between other pairs of actors in the value chain, such as between producers and input suppliers as in Case 4.4. in the following section. This framework can also be extended to capture the interaction of decisions between more than two value chain players. As the intuition remains broadly similar, we focus on two-player interactions for the sake of clarity.

Figure 1: Coordination Game

		Producers	
		Coordinate	Don't
Processor	Coordinate	(a, a')	(c, b')
	Don't	(b, c')	(d, d')

collectively invest in upgrading because they are undisciplined (and hence may engage in side-selling when contracted) or lack access to credit (and hence cannot make the investment). Additionally, processors may not trust these farmers because they are costly to monitor in the face of asymmetric information. Farmers may have similar concerns about final goods processors taking advantage of them through hold-up behavior given their differential market power. Hence in the face of this uncertainty regarding the other player's actions, neither player will want to invest if the payoffs to coordinating are not significantly larger than the payoffs to not coordinating. Mathematically, the processor will suppose that producers will choose to coordinate with the probability p' , and producers will suppose that the processor will choose to coordinate with probability p . Hence the producers will choose to coordinate if $pa + (1 - p)c > pb + (1 - p)d$ which is if $p > (d - c)/(a + d - b - c)$. Similarly the processor will coordinate if $p' > (d' - c')/(a' + d' - b' - c')$.

Up to this point, we have just considered how two key value chain actors may interact under the status-quo. Now we turn to the role of coordination facilitators (such as NGOs, government services, etc.), who assist the emergence of multi-stakeholder platforms that can coordinate the relationship between players. There are two main ways that these multistakeholder platforms can provide a “big push” that will motivate both players to coordinate and invest:

1. *Changing payoffs*: In many cases, multi-stakeholder platforms shoulder part of the burden related to the cost of technological innovation, cost of information, cost of infrastructure, scale issues, overcoming contracting frictions, and lack of credit.³ For example, local university researchers may invest resources to develop improved seeds that will upgrade the value chain, and hence neither farmers nor final goods producers need to finance this investment. In that way, platform members literally have increased the payoffs to choosing coordination by decreasing the cost of value chain upgrading. Mathematically, the platform increases $a - b$ and $a' - b'$, while holding p and p' fixed, which will increase the probability that the players coordinate.
2. *Changing perceptions of p and p'* : Given the additional accountability brought in by intermediary players such as government or NGOs, this might directly change players' perceptions of how likely the other player is to coordinate and engage in costly investment. These interventions can help overcome issues of lack of governance, intra-sector conflict, and asymmetric information.⁴⁵

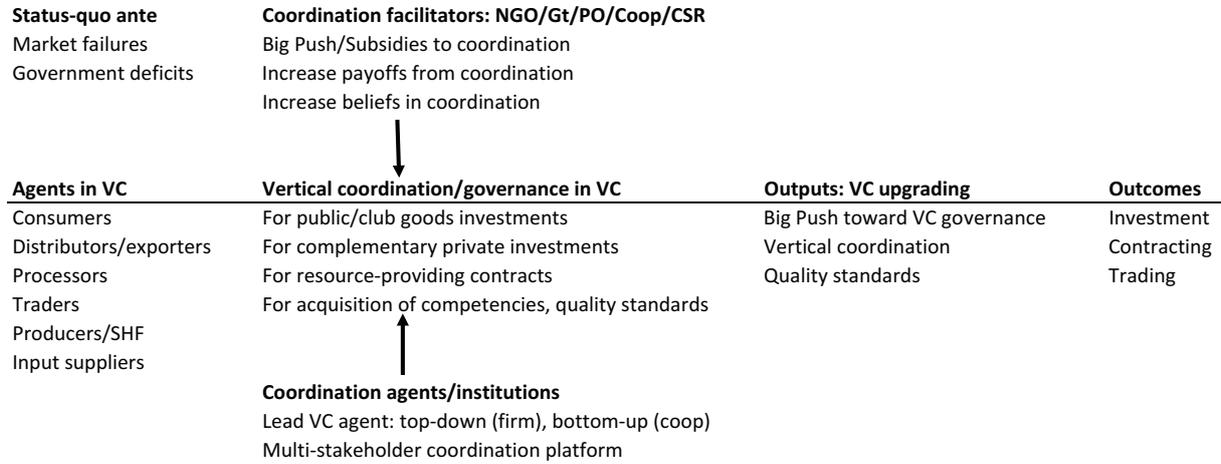
Though this model is highly stylized and simplistic, it gives the overall picture of how a coordination failure can result in lack of investment, contracting, and trading in a value chain, and how a multi-stakeholder platform might help value chain players transition from a Pareto-inefficient to a Pareto efficient Nash equilibrium when the value chain is upgraded. Coordination failure is often multidimensional, and there are

³Platforms could also change payoffs in any other dimension or caused by other market failures; however these are the dimensions most frequently mentioned in the literature.

⁴Like above, there may be other issues for which a platform can help overcome by changing perceptions about probability of coordination, but these were selected as they were mentioned in various cases in the literature.

⁵This changing of perceptions of p and p' can be thought of as similar to pre-game communication or “cheap talk” in the framework of the assurance game in Baland and Platteau (1996)[1].

Figure 2: Theory of Change in Value Chain Coordination



likely a combination of issues that keep value chains at the inefficient equilibrium such as matching frictions, costs of obtaining market information, asymmetric information, costs of investment in supply chain innovation and other resources, lack of necessary infrastructure or policy, credit constraints, and issues of market scale. In this model, these combinations of market failures and government deficiencies which are costly to overcome all look the same—a costly barrier to overcome that without a change in the payoffs and/or in the beliefs about the other player’s behavior, keep both players in the inefficient equilibrium. Therefore, it does not provide intuition besides generic ways in which the platform can intervene to solve these various combinations of market failures. To get a more nuanced sense of the combinations of factors that can lead to a coordination failure in various settings and the role of a lead agent or a multi-stakeholder platform in solving them, we turn to case studies that highlight this information.

In these case studies, the theory of change we use in analyzing the role of lead agents and multi-stakeholder platforms in value chain coordination is represented in Figure 2. The status-quo ante is one where market failures and government deficiencies hold back investment, contracting, and trading in a value chain where agents are input suppliers, producers, traders, processors, distributors and exporters, and consumers. Coordination facilitators such as NGOs, the government, producer organizations, and corporate social responsibility programs engage in Big Push initiatives and subsidies to coordination. This helps increase the payoffs from coordination and beliefs in positive coordination behavior among agents in the value chain. Coordination agents and institutions can be lead agents in the value chain (such as firms or producer organizations like cooperatives) and multi-stakeholder platforms. Coordination is important for public/club goods investments, complementary private investments, resource-providing contracts, acquisition of shared competencies, and high quality standards. The output of vertical coordination is upgrading of value chain governance and achieving high quality standards. Final outcome is enhanced investment, contracting, and trading in the value chain.

3 Case Studies

3.1 The Bubaare Innovation Platform Multipurpose Cooperative Society Ltd for sorghum (Uganda, founded in 2008)[7]

3.1.1 Initial Coordination Problems

Costly technological innovation, scale issues, contracting frictions, credit constraints, lack of governance

Almost every household in Bubaare, Uganda, grows some sorghum using traditional methods, which involves substantial labor inputs, generates low yields, and produces output that is often not of market quality. Regardless, sorghum is important as it is used to make a traditional beverage as well as make baby food. Despite the cultural importance of the food item and the supply generated by all of these households, before the platform's launch almost none of the households sold sorghum. Much of this is due to some logistical issues related to sorghum-based products: if not stored properly, after a few days the baby food goes bad and the beverage turns alcoholic. So farmers would need to either figure out a way of packaging and storing the good safely at home in order to market it, or sell the raw sorghum to a processor. Yet, as these are "traditional" goods, small-scale processors who might be interested to market the product may not have resources on a sufficiently large scale to store and package these goods, and may not be able to access credit to obtain these resources.

On top of these concerns about the cost of market resources, the issue of scale remains, as small farmers only have limited surplus amounts of sorghum to market, and it may only be profitable to contract with them if a co-operative has formed between farmers. Yet, in this area, there has been a history of poor organization of co-ops, and general lack of governance of local resources, for example of land used for communal gardens. Hence in order for the value chain for sorghum products to develop in this context, major innovations for the storage of sorghum products will be necessary, credit will likely be necessary in order to be able to invest upfront in such innovations, producers will need to join together such that they have sufficient products to supply, and processing firms will need to be connected with reliable producing farmers. This cannot be solved simply by individual farmers and processors if neither party has sufficient funds or credit to innovate, and as neither has the incentive to invest in these costly innovations.

3.1.2 Stakeholders

- *Producers:* smallholder farmers (later co-op members), farmer self-help groups
- *Processor:* Huntex Ltd., with outlet supermarket as well
- *Facilitators:* Forum for Agricultural Research in Africa (FARA), Consultative Group for International Agricultural Research (CGIAR)
- *Credit partners:* Agriculture Innovation System Brokerage Association (AGINSBA), Crane Bank, Muchahi Savings and Credit Cooperative (SACCO)
- *Policymakers:* Local Government, Uganda National Bureau of Standards
- *Research:* Kabale Zonal Agricultural Research and Development Institute (KAZARDI), Department of Food Science and Technology at Makerere University

3.1.3 Solutions

Donor facilitators introduced farmers to improved crop management practices, including correct plant spacing. Additionally, KAZARDI, through field trials with platform farmers developed new sorghum varieties that mature in shorter periods of time and produce higher yields. These activities not only subsidize costs of innovation for farmers, but also help develop a critical mass of sorghum output such that farmers in Bubaare can be suppliers of sorghum. The platform's credit partners have also offered small loans to these farmers such that they can afford these improved production inputs, in a self-help group liability structure. These self-help groups were also given saving and borrowing training through research partners at Makerere University and NGO support. In response to governance issues, the platform worked with local parish governments to create new natural resource management bylaws, that are more conducive to sorghum value chain addition, which are used to "protect gardens and guide marketing procedures." [7] These were approved in Bubaare sub-county in 2010.

To address the issue of packaging sorghum beverages more sustainably, Huntex Ltd. worked with other platform members to develop methods of packaging (hygienically and attractively) a non-alcoholic sorghum beverage that could be obtained from the sorghum that platform farmers were producing. They have also further developed the product by adding honey as an ingredient, and the drink has become popular among consumers. Given this success, credit constraints to Huntex Ltd. in not being able to afford to package the beverage on a larger scale have been alleviated, and they have been able to expand their factory and get new machines. Huntex ultimately also contracted with platform farmers to supply their sorghum in agreed upon quantities and prices, given the improved quality from all of the production innovations and alleviation of initial matching frictions. Besides the partnership, platform farmers have also been taught methods by the Department of Food Science and Technology at Makerere University to make sorghum flour, and platform farmers make and package the flour, that is then distributed to local supermarkets. They have collaborated with the Uganda National Bureau of Standards to have quality ratings for these products.

Given the success of the platform so far, there has been expansion into other crops and ability to obtain infrastructure by the platform. For example, the sub-county government donated a piece of land as well as an unused store to serve as a trading center (to use for sorghum storage) in recognition of the dedication of platform members. The platform purchased a computer, where members can look up market price information. They have plans to further purchase a building with an office, a community bank (currently their savings are stored at Crane Bank and Muchahi SACCO), a potato processing unit, a sorghum milling and packaging facility, and a computer room.

3.1.4 Degree of Success and Key Takeaways

In 2013, Bubaare IP decided to formally register as a cooperative society, in search of better marketing opportunities and infrastructure development. As of 2014, they had over 1,000 dues-paying members. Additionally, through internal generation of funds by members, there has been ability to loan funds to other members and self-help groups, without use of a credit partner. The society has plans to continue operation and expansion even without donor intervention. However, it is noted that there was some uncertainty about how to best distribute co-op earnings to members, with no concrete plans.

This case is often lauded as a major success of a multi-stakeholder platform. Engaging actors in platform activities led to technological innovation (in terms of creating a new product) that served both small farmers' and small processors' needs. But besides this innovation, the platform had a key role in organizing smallholder

farmers among themselves; they were able to create a structure (specifically a self-sustaining cooperative society) that allows them to contract directly with the processor. Crucially, though outside facilitators played a key role in initiating the platform's activities in the short run, it seems that the platform served as a transitory coordinating "push" to a more productive long-run equilibrium. This exercise helped value chain players overcome the initial problems that made coordination unfeasible, and created clear pathways to overcome potential issues in the future (for example, lack of infrastructure can be solved by the co-operative investing in this infrastructure collectively on behalf of members).

3.2 MilkIT Platforms (India, founded in 2013)[12]

3.2.1 Initial Coordination Problems

Costly technological innovation, lack of infrastructure, scale issues, credit constraints

In remote areas of Uttarakhand, India, many women rely on milk production as a source of livelihood. Yet production is characterized by the use of traditional methods, not utilizing improved feed (and relying upon highly labor-intensive methods to collect fodder) and use of poor breeding techniques, resulting in a lower quality product and inefficient input use. Credit constraints often inhibit farmers from improving or expanding their operations. Each individual woman produces only a small quantity of milk, and costs of trading can be quite high given that many women in remote areas have to travel for miles to get access to a paved road to transport their milk to a market.

Given this, the state dairy cooperative (Aanchal) played a role in buying milk locally, but only operated in a few villages in Uttarakhand and was subject to other complaints from farmers such as noncompetitive prices being offered for milk, and demanding an unreachable minimum number of participating households to get a local milk collection center. Because of small scale and high transaction costs, most traders were not willing to purchase milk from these smallholders and transport it to market. As a result, women in remote areas mainly produced milk for home consumption and gave any surplus to friends as gifts instead of selling it. Yet this was perceived as sub-optimum as there is great demand for milk in India and farmers would likely be better off selling their excess milk.

3.2.2 Stakeholders

- *Producers*: smallholder farmers (mostly women)
- *Facilitators*: International Fund for Agricultural Development (IFAD), Bharatiya Agro Industries Foundation (BAIF), International Livestock Research Institute (ILRI), other local NGOs
- *Input supplier*: local input manufacturer
- *Credit partners*: commercial banks, National Bank for Agricultural and Rural Development (NABARD)
- *Training services*: District Animal Husbandry and Extension Services (KVK)
- *Policymakers*: State dairy cooperative (Aanchal)

3.2.3 Solutions

The MilkIT program chose the Almora and Bageshwar districts as regions of focus and in each location developed sub-IPs focusing on feed innovations and on developing market linkages. In Bageshwar, in the

wake of concerns about unfair prices for milk from Aanchal that arose at platform meetings and were not addressed, platform farmers organized the Jeganath dairy cooperative, an independent self-help group cooperative covering 8–10 villages. The group established a shop in Bageshwar and contracted a private vehicle for collecting milk from participating villages. In each participating village, elected secretaries collect milk. Farmers are paid agreed upon prices for the milk, depending on the milk's quality.

In Almora, farmers petitioned to Aanchal to change rules regarding the minimum number of households needed to have a local collection center. The result was that Aanchal allowed nearby settlements to combine households to meet requirements to get a collection center, and as a result, four new centers were established.

In terms of credit constraints, NABARD started extending credit to farmers to buy high-yielding dairy animals (such as crossbred cows) at subsidized interest rates. Many of these farmers had traditionally been excluded from all formal sector lending prior to this. NABARD introduced group liability loans to the area as a way to give credit to farmers with few assets. Another private bank who also became interested in extending loans to this population appointed a block level coordinator to reduce monitoring costs associated with moral hazard issues in lending to smallholders.

To improve production processes, specifically inefficient fodder collection, facilitators contracted with a local manufacturer to produce mechanical sickle choppers and sell them to local farmers at a low price. Additionally, facilitators and farmers developed a cheap and simple feeding trough to reduce fodder wastage (from animals stepping or urinating on fodder). Met with initial skepticism by farmers, participatory field trials were carried out, and IFAD subsidized the costs of buying choppers and making troughs (by 50%). Local extension providers (KVK) suggested and implemented field trials of dual purpose crops (used as household food as well as animal feed) such as wheat and barley, which could be cut for fodder during the vegetative stage without affecting eventual harvest grain yields.

3.2.4 Degree of Success and Key Takeaways

While many farmers were initially skeptical of adopting new technologies, after field trials, input subsidies, and loan provision, many began to upgrade their production processes. Notably, unlike in the previous case study, this multi-stakeholder platform did not include any downstream value chain players (such as processors or traders) as formal platform members. While this was the initial intent of the platform, facilitators struggled to get any traders to join formally. Yet much like in the previous case, the platform helped farmers to both upgrade their production processes *and* create a lateral organizational structure among smallholders, namely a cooperative. As a result, some traders did start to service some of the villages in the study area and to trade with small milk producers.

In terms of platform outcomes, it is notable that in this case even the same initial platform goals in two fairly similar regions led to very different long-term outcomes. Farmers in Bageshwar took opportunity of the platform to share their concerns about the milk value chain with other smallholders. They let this dissatisfaction inspire them to engage in collective action, and form institutions that would better serve them through horizontal coordination. Hence in this way, the platform did serve as a “big push” for farmers to form a coordination mechanism (a cooperative) which was able to establish its own governance structure. Hence in this area, and like in the previous case study, we may not expect the continued need for a platform going forward.

Yet, in the Almora district, farmers used the platform to lobby for changes in what they saw as unfair policy. While the government did in part respond to farmers' concerns, it retained its role as local market governor. Hence after initial platform activities, the role of sustaining coordination activities naturally fell

to the government (as farmers in Almora were no more structurally organized than they were before the platform and still lacked market power). Indeed, the Chief Development Officer of Almora district decided to continue to facilitate stakeholder meetings at the district level to address dairy development. More importantly, the government, and specifically the Aanchal state cooperative, continues intervening in the market in the long-term, buying milk that traders see as too unprofitable for them.

3.3 Cadenas Agrícolas Productivas de Calidad (CAPAC) for native potatoes (Peru, founded in 2003)[4][13]

3.3.1 Initial Coordination Problems

Costly technological innovation, information constraints, contracting frictions, asymmetric information

Small potato farmers in Peru often have poor market access, use less modern inputs, and tend to grow native potato varieties which are rarely sold in modern markets. These varieties are hence generally sold through more traditional, rather than high value market chains, with various intermediaries handling the goods, to be eventually sold loose to the consumer. Given the small quantities handled by each component of the value chain (with not one actor wielding significant market power) and the price volatility associated with selling on spot markets, it is difficult for the various actors to coordinate and invest in profitable infrastructure or quality-enhancing innovations.

Native potatoes grown by these traditional farmers are thought to potentially have a “high value” market among higher-income consumers in Lima, as there is a trend toward eating traditional “Andean cuisine.” However, smallholders have little information about selling in high value markets. In turn, large potato processors have a difficult time finding and establishing trusted relationships with individual smallholders, and need to be assured that potatoes supplied will meet their quality standards (which may not always easily be observed) and that smallholders will deliver promised quantities of potatoes on time. Additionally, in order to upgrade the value chain, it will be necessary for value chain actors to invest in research on how to use and market these native potatoes toward high-income consumers, as they are a “new good” in modern markets.

3.3.2 Stakeholders

- *Producers:* Small/medium farmers
- *Processors:* Frito-Lay, Villa Andina, Gloria Group
- *Wholesalers:* Union of Stevedores of Lima wholesaler market, 4 other wholesalers
- *Retailer:* Wong Supermarket Group
- *Facilitators:* International Potato Center (CIP), Innovación y Competitividad de la Papa (INCOPA), Fomento de la Vida (FOVIDA), La Asociación para el Desarrollo Sostenible del Perú (ADERS), SEPPRA, Centro de Estudios y Promoción del Desarrollo (DESCO), PROPAARE
- *Marketing information:* Mi Chacra
- *Other agroindustry players:* AL Exportaciones y Servicios S.A.C., Colcahuasi

- *Research:* Gastrotur Cooking school
- *Policymakers:* Ministry of Agriculture and Irrigation (MINAG), Municipal Market Governance (EMMSA), local government

3.3.3 Solutions

CIP, through their INCOPA project, established Cadenas Agrícolas Productivas de Calidad (CAPAC) to facilitate value chain upgrading between various market actors. In practice, CAPAC has taken on a strong role as a market intermediary and governor, alleviating issues of contracting frictions, information frictions, and lack of trust between producers and processors detailed above. CAPAC has facilitated relationships between farmers who produce native potatoes and Frito-Lay, as well as the Wong Supermarket Group. Specifically, these relationships are generally maintained and facilitated by local NGOs who serve as intermediaries (or sometimes the platform itself serves as the intermediary if there is no local NGO). The intermediaries alleviate many of the concerns processors have in working with small farmers, providing services including contract management, quality control, and delivery at the plant. Hence the intermediaries play a central role in capacity building for all stages of the smallholders' production processes, including: planning, production and postharvest management. The platform also provides information to smallholder farmers on market prices through the Mi Chacra partner, to help inform production decisions, as farmers often find this information costly to access otherwise.

Additionally, in terms of innovation in marketing potatoes to higher income consumers, the platform has participated in national advocacy in terms of helping co-organize such events as “National Potato Day.” It has also established such trademarks as “Mi Papa” designed to promote consumer quality recognition over a range of potato products, and the “Andean Potatoes Label,” a CSR label insuring the local and ethical sourcing of potatoes. Additionally, the Wong supermarket group, where many of the platform's potatoes are sold, has established the “Ayllin Papa” system of cleaned, graded, and packaged local potatoes. It has developed ways to cook these native potatoes in gourmet cuisine through experimentation at the Gastrotur Cooking School. CIP researchers also introduced improved storage methods, such as the use of sprout inhibitors in stored potatoes to make potatoes last longer in storage.

3.3.4 Degree of Success and Key Takeaways

CAPAC has in some sense being quite successful in that it has been able to foster a new market for native potatoes in Peru. In doing so it has created a sustainable system for reliably sourcing native potatoes produced by smallholders. CAPAC appears to still be active at least as of 2014, and Peru continues to celebrate National Potato Day annually.

However, more so than any of the platforms discussed previously, CAPAC takes a heavy-handed approach to value chain governance, essentially inserting NGOs as permanent facilitating intermediaries. Hence as long as these local NGOs continue to play the role of quality assurance/contract fulfillment insurance for the processor, this system can continue to thrive, and CAPAC itself can oversee all of the individual contracts in local areas. However, smallholders have not engaged in horizontal coordination, nor have they gained the market power and agency to work with large processors in their own right. Hence though CAPAC seems sustainable, it places the role of coordination permanently in the hands of many small non-profit organizations that are overseen by the CAPAC platform. In this case the platform is thus not a temporary “big-push” but a permanent facilitation mechanism.

3.4 Cowpea-Soybean Innovation Platform (Nigeria, founded in 2009)[8][10][15]

3.4.1 Initial Coordination Problems

Costly technological innovation, lack of infrastructure, contracting frictions (with input dealers)

Generally smallholder farmer associations in the cowpea and soybean (both grown for human consumption and for animal fodder) value chains in the Kano and Kaduna states of Nigeria still farm with traditional methods, often not utilizing modern inputs. Part of this is due to poor public extension services (an example of deficient government-provided services) and part is due to farmers not being able to find affordable inputs that suit their needs (because for example seeds are generally sold in bags which are too large for a single farmer to use). One area where practices are particularly lacking is in fending off crop diseases and pest infestation. Many cowpea farmers in this context lose their crops to striga during the growing stage and to weevil infestation during the post-harvest period. In turn, soybean farmers often lose crops to rust. Soybean farmers also feel dissatisfied with the low prices they are paid for their crops. Yet processors who are buying their crops (such as vegetable oil producers) are not large scale entities and are not able to pay a higher price for goods given high-quality competition from the international market. Additionally, these processors have a hard time transacting with small scale farmers given their low-quality products and poor storage techniques.

3.4.2 Stakeholders

- *Producers*: 15 farmers organizations and associations
- *Facilitator*: UK Department for International Development's Research Into Use (DFID-RIU) program
- *Input suppliers*: 3 animal feed producers, 2 producers of seeds, 2 supplies of agro-chemicals, an agro-technology fabricator, and a producer of storage bags for grains
- *Market associations*: 2 producers marketing groups
- *Credit partners*: First Bank, Fidelity Bank
- *Training services*: Agricultural Development Programmes (ADPs)
- *Research*: International Institute of Tropical Agriculture (IITA), CGIAR, Institute of Agricultural Research (IAR), the National Animal Production Research Institute (NAPRI), the National Agricultural Extension Research Liaison Services (NAERLS), the National Stored Products Research Institute (NSPRI), and the Agricultural Research Council of Nigeria (ARCN)

3.4.3 Solutions

Through research, field tests, and discussion with input providers, platform farmers successfully acquired and planted authentic seeds for medium-maturing dual-purpose (fodder and food products) and Striga-resistant cowpea varieties, as well as rust-resistant, early-maturing varieties of soybean. The inputs were purchased directly by smallholder farmers associations from input providers, and were delivered and distributed to farmers by RIU program staff. Importantly, these inputs were packaged for the first time in 2

kilogram tamper-proof bags instead of the normal 50 kilogram bags, which facilitated much easier distribution to individual members in each farming association, and ensured fair distribution of affordable seed quantities among members.

In order to combat weevil infestation during the storage process, researchers introduced over 600,000 farmers in various farmers associations to the “triple bag” method, which consists to storing post-harvest crops in locally-produced airtight storage bags (bought from another input provider in the platform). Cowpea and soybean farmers were trained on improved handling and management of fodder stockpiles to be sold to livestock farmers, through platform training workshops. Additionally, an agro-technology firm platform member manufactured and introduced a hay compactor to farmers and fodder dealers, which was then purchased and put into use in various communities.

To deal with soybean farmers’ concerns about low prices and vegetable oil producers’ concerns about foreign competition, platform researchers did a study to try to fully understand price movements and potential solutions. This study’s findings were presented in a policymakers’ forum, and potential policies to help soybean producers and oil processors secure their livelihood are in discussion. Additionally, the platform attempted to implement a federally-funded public-private partnership initiative with First Bank and Fidelity Bank to provide low-cost loans to platform members. Yet it is unclear that this program actually ever began.

3.4.4 Degree of Success and Key Takeaways

Perhaps most notable about this case is that the main value chain innovation was not in the link between producers and processors, but rather the link between input suppliers and producers. The platform seems to have provided a unique forum for input suppliers to better understand smallholder producers’ needs such that they could innovate both in terms of the product itself (making sure to offer disease-resistant seed varieties) and in terms of packaging (creating smaller tamper-proof packaging). In this way, the initial “big push” of platform activities helped make the value chain more efficient.

In terms of longer-run outcomes, though the RIU program was the initial facilitator, the platform became self-administered, with some of the meetings even being sponsored by private sector players. For instance, farmers groups paid travel costs for representatives to meet with seed companies. In turn, seed companies would sometimes step in and deliver seeds to farmers for free. Generally, it seems farmers associations and input companies were able to jointly innovate and form lasting relationships. However, it is noted that not all of the farmers associations were able to experience the benefits of the improved seeds if there was any corrupt behavior among leaders. For example, some delegates collected, diverted, and sold the authentic seeds for a higher price elsewhere. Hence in the long term, it is unclear if there will be the continued need for a platform (except perhaps to continue advocacy on soybean price issues), as direct relationships have been developed between producer organizations and input producers.

3.5 Cashew sector Agro Industrias Asociadas (Mozambique, founded in 2004)[6][17]

3.5.1 Initial Coordination Problems

Costly innovation, information constraint, lack of infrastructure, asymmetric information. In the early 2000s, in response to the decline of a once thriving export-oriented cashew sector in Mozambique, USAID initiated a project with the objective of revitalizing the sector, in a way that would also benefit smallholders. Their analysis found that one potential way that these producers could benefit was to open small cashew processing plants that could contract directly with smallholder farmers. Hence, USAID

researchers helped pilot and test a model of small hand-processing plants, and helped various plants emerge in the Nampula province. As these were new small firms in a new market, the firms faced difficulties getting market information necessary to export to foreign markets. Hence the processors relied heavily on extension services provided by USAID to help them access foreign markets (such as help procuring packaging materials, verifying that the quality of their output was fit for global markets, providing general market information, etc.) However, USAID did not want to provide these free extension services in the long run as it wanted the industry to become self-sufficient. Yet only one of the small USAID project plants in Nampula was profitable enough by 2004 to purchase its own private extension services. Consequently the local cashew sector was essentially on the brink of collapsing again once USAID withdrew its support.

3.5.2 Stakeholders

- *Producers*: Smallholder farmers
- *Processors*: Seven small processors
- *Retailers*: Foreign buyers
- *Facilitator*: The United States Agency for International Development (USAID)

3.5.3 Solutions

USAID gathered these small processors together, and jointly the processors realized that while none of them (barring one plant) could afford fee-based extension on their own, that if they all coordinated in investing in starting a firm that would provide extension services, then this could be affordable. Accordingly, seven plants in Nampula each invested US\$500 of seed money to start Agro Industrias Asociadas (AIA), a private-sector firm that would provide extension services to all of the processors (and of which each processor was a part owner). AIA help processors overcome the difficulties associated with exporting to international markets by providing services in the categories of processing, distribution, and marketing. In terms of processing, AIA imported machines and packaging materials for the firms to use. For distribution, AIA would store goods and contract with international buyers to distribute goods internationally. Additionally, to deal with asymmetric information concerns related to quality, AIA would perform quality control services, refusing to work with suppliers after “three strikes” of providing sub-par products. In terms of marketing, AIA provides marketing information to processors, lobbies for more favorable policies for cashew growers on the national level, and helped to create the “Zambique” label to draw distinction in international markets to the cashews that these processors export.

3.5.4 Degree of Success and Key Takeaways

After the initial set up of AIA, AIA as well as the associated processors have continued to thrive. AIA still is in operation at the time of this paper, and through its recruitment and training of new processors it had involved the majority of processors in Northern Mozambique. It is now a leading cashew exporter firm in Mozambique with over 2,000 employees. While originally AIA only contracted with one foreign firm: a Dutch broker called Global Trading & Agency BV who distributed the cashews to European markets, by 2015 they had also expanded to contract with buyers in the United States.

Unlike most of the case studies discussed here, this case focuses less on the vertical coordination between smallholders and processors, but rather on an example of horizontal coordination between processors (within

a value chain containing smallholders). However, this example very clearly illustrates the theory behind the need for coordination: various firms would be made better off if they all contributed to a costly investment (in this case in extension services), but most would not profit from engaging in this investment alone. Additionally, of interest here is that while these processing firms arose essentially through a project by a foreign donor (through USAID), the investments in coordination were made entirely by the value chain players themselves. Additionally, through coordination these firms were able to jointly gain more market power, such that they have been able to take a lead role in governance for the sector, including lobbying for better policies industry-wide (such as lower export taxes on raw nuts).

3.6 Uganda Oilseed Subsector Platform (OSSUP) (Uganda, founded in 2005)[10][16]

3.6.1 Initial Coordination Problems

Costly technological innovation, contracting frictions, intra-sector conflict

Various oilseed crops are grown throughout Uganda, including sesame, groundnuts, soybean, cotton, and sunflower. In 2005, the Uganda Oilseed Producers and Processors Association created the Ugandan Oilseed Subsector Platform (OSSUP) in order to address market issues such as quality standards, technological upgrading, and the provision of financial services. Initial discussions of the platform identified matching frictions between producers and processors of oilseed crops as, outside of contractual arrangements with larger processing firms, most farmers sold their produce immediately after harvesting to farmgate brokers, village traders, or small-scale millers nearby, in no organized market. Consequently, not all buyers could get the amount of raw materials they demanded.

Additionally, the OSSUP engaged in various planning and collective marketing activities, represented a variety of farmers associations and producers, and controversially engaged in multiplication and distribution of open-pollinated sunflower varieties (which were developed by government researchers at NARO). While the Uganda Oilseed Producers and Processors Association, a leading processing firm, and a main distributor of vegetable oil were all linked to open-pollinated varieties, in 2006, the Mukwano company implemented a contract farming scheme which imported hybrid sunflower seeds for distribution to around 30,000 contracted smallholder farmers, who were also expected to sell their seed to the company. The rift between open-pollinated and hybrid seed users caused great conflict, and many did not want OSSUP to facilitate the sector any longer. Hence Agri-ProFocus network with research partners stepped in to restructure the already existing OSSUP platform, hoping to resolve conflict and move forward with their previous agenda to advance the oilseed sector.

3.6.2 Stakeholders

- *Producers:* Uganda Oilseed Producers and Processors Association (UOSPA), farmers organizations
- *Processors:* large and medium-scale processors, Mukwano Company
- *Facilitators:* Agri-ProFocus Network, Netherlands Development Organisation SNV, IFAD
- *Training services:* National Agricultural Advisory Services (NAADS)
- *Research:* National Agricultural Research Organisation (NARO), Makerere University, Wageningen University

3.6.3 Solutions

Through a variety of stakeholder discussions, platform members were able to resolve their conflict by essentially drawing out two possible production chains (one involving open-pollination seeds and the other involving hybrid seeds), and deciding that the industry did not have to converge on one production chain; both could exist. Hence further policy objectives of the platform focused on promotion of both chains; for example: breeders from NARO proposed to work on research and improvement of both hybrid and open-pollinated varieties. The platform also conducted lobbying efforts at the national level, which succeeded in getting hybrid seeds access to be relabelled as a public good.

Besides conflict resolution, other initial policy areas could be addressed such as upgrading value chain technologies. To do this, the platform worked with NAADS, the national extension service, to focus more extension in a specific value chain (oilseeds) instead of a more ad-hoc agenda that switched between crops. The platform also organized a Research & Development Marketplace at the Department of Food Science and Technology at Makerere University in 2010 to spread information about new technologies in the oilseed value chain to various chain members. Other technologies were developed and experimented with by platform researchers, including a rural works vehicle adapted to poor road conditions, such that it could transfer supplies and collect outputs in remote areas using satellite location.

3.6.4 Degree of Success and Key Takeaways

This case study is quite different from other cases in that a coordination platform already existed before facilitator interventions. However, the platform openly struggled to resolve a conflict over which seed type to use. Hence in this case, a major role of the outside facilitator was to mediate the dispute between players, and provide guidance to the fragile post-conflict platform in initiating activities that cater to all industry players' needs (rather than players in only one of the seed chains).

In terms of long-run outcomes, in a sense, the platform was a success in that it solved the conflict that outside organizations were called in to solve, at least in the short run. Yet at the same time, many of the matching frictions that seemed to be initial issues calling for coordination seem to have been left unsolved. Additionally, after IFAD pulled its funding in 2016, the organization had trouble continuing its operations. Part of this had to do with the organization's history of conflict, which made it unclear who to put in charge. But in this case, there seems to be a strong case for the need of continued coordination both to set policy at the national level, resolve market frictions, and address future disagreements.

3.7 Monze Conservation Agriculture Platform (Zambia, founded in 2009)[8][9][10]

3.7.1 Initial Coordination Problems

Costly technological innovation, information constraints

Smallholder farmers' practices in Zambia have led to degradation in soil quality, which ultimately results in lower yields. One way to possibly combat this is through adoption of conservation agriculture practices, which promote minimal soil disturbance, permanent soil cover, and crop rotation. Yet, in the Monze district, there is very low adoption of these practices as well as of other modern agricultural practices. Farmers in this area tend to have little knowledge of the environmental impacts of traditional farming practices nor about how to adopt conservation agriculture practices. This makes it challenging for processors of any crops to consistently buy from smallholder farmers, as crop quality is low and will only decrease over time as soil

degrades. Without value chain upgrading, in the form of investing in the development and proliferation of more sustainable practices, the sector may not be able to exist in the long term.

3.7.2 Stakeholders

- *Producers*: local producer groups with lead farmers, Zambia's National Farmers Union
- *Facilitators*: DFID-RIU program, local NGOs
- *Input supplier*: local agricultural input supplier
- *Other private sector player*: the Monze Business Association
- *Policymakers*: Ministry of Agriculture and Co-operatives (MACO), local district agricultural coordinator in Monze (also chair of platform/facilitator)
- *Media*: local radio stations, Zambian National Information Services, National Agriculture Information Services
- *Lobbying*: National Innovation Coalition (NIC) (created by RIU program in general at national level)

3.7.3 Solutions

At the local level, facilitators from the platform conducted various trainings to teach smallholder farmers more about the principles of conservation agriculture. These trainings included field school, field days, and sometimes product shows (sponsored by seed companies) at the project's fifteen learning sites and demonstration plots. To further overcome information constraints that inhibit farmers from learning about conservation agriculture, a local radio station developed participatory programs designed to teach these practices. To ensure transmission, the platform organized local listening groups for farmers who could discuss the radio program after listening with other farmers and experts.

Platform facilitators noticed that one of the key factors inhibiting the adoption of conservation agriculture among smallholder farmers was the high demand for labor needed for tillage and weed control, given that ripping by draught power was unaffordable for many farmers (due to loss of many animals in the region to livestock diseases). Hence the platform instituted a voucher system, where farmers would get vouchers for the use of an animal, animal-drawn rippers, and herbicides at a (50%) subsidized price. Finally, at the national level, NIC has been lobbying for government policies that promote conservation agriculture and incorporate the teaching of sustainable agricultural practices into the national extension program.

3.7.4 Degree of Success and Key Takeaways

Facilitators claim that the platform led to improved interaction between public and private service providers and farmer groups, including the development of commercial ripping services, as well as enhanced involvement of agro-dealers in the promotion of conservation agriculture. However, this program, much like the one in the CAPAC case in Peru seems to have had activities and objectives that were set based on the goals of the programs' facilitators rather than necessarily based on the feedbacks of particular stakeholders.

In terms of long-run outcomes of the platform, the Monze platform has tried to build sufficient administrative capacity for its programs to continue to function. One year after the platform's establishment, it became a sub-committee of the District Development Co-ordination Committee (DDCC), which is part of

local government. Yet it is unclear whether private sector partners remained involved when initial facilitators left, as it is a strongly government controlled platform. Facilitators noted that when “sitting allowances” including transportation costs to meetings were no longer made available to members, membership “changed.” Hence, it seems that the platform’s programs will indeed continue, but more as a government extension effort than as a multi-stakeholder platform.

3.8 Poultry Sub-sector Innovation Network (Tanzania, founded in 2009)[8][9][10]

3.8.1 Initial Coordination Problems

Costly technological innovation, lack of infrastructure, scale issues, contracting frictions, credit constraints, asymmetric information

Various smallholder farmers in Tanzania keep indigenous chickens, as they are a relatively simple agricultural investment yielding quick returns not subject to seasonality. Yet the market for indigenous chicken eggs in the Coast Region of Tanzania is disorganized and geographically separated. While farmers are generally located in rural areas, various hatcheries, input producers, and input suppliers are mostly located in urban areas. There is also limited extension for poultry products, few organized transporters, and virtually no formal markets or marketing systems. In addition, farmers who would like to raise poultry often have difficulty getting loans to purchase new chickens, only own a few chickens, and do not use the most modern farming practices, making them risky for buyers to contract with.

Noting all these issues, the DFID-RIU program attempted to organize in 2009 a multi-stakeholder platform in the Coast Region to bring stakeholders together to address them. Yet, non-participation and low organizational capacity caused this platform to disband. Instead of quitting altogether, the RIU program decided to promote network-wide linkages and see the RIU program as an “innovation broker.” Hence, even without a formal platform, “network” participants were able to work together and improve the poultry value chain. The network programs eventually also spread to the Dodoma and Singida regions.

3.8.2 Stakeholders

- *Producers:* small and medium producers (farmers and hatcheries)
- *Wholesalers:* wholesale buyers of indigenous chickens
- *Facilitators:* MUVEK Development Solutions Ltd (consultancy firm managing much of the project), DFID-RIU program
- *Input suppliers:* vaccine and drug distributors and suppliers, feed producers and distributors, and rural agro-shops
- *Research:* National Livestock Research Institute, Veterinary Investigation Centre
- *Policymakers:* Ministry of Livestock Development and Fisheries, local governments, and extension service

3.8.3 Solutions

A business initiative called KukuDeal was introduced by the network to take on a central role in stimulating and coordinating business and market linkages between stakeholders both during the RIU program

as well as after. KukuDeal implemented a contract-farming model, where farmers were encouraged and financially assisted to keep at least between 200-300 chickens, such that said farmers could sustain a contract with producers, and that the market could continue to exist on a national scale. KukuDeal reduced matching frictions by finding and organizing wholesalers and traders of local chicken into the scheme, who would then purchase smallholders' chickens.

This program also alleviated credit constraints, as KukuDeal provides poultry producers with interest-free investment capital under the form of 200 day-old chicks payable at the time of poultry delivery, as well as loans to purchase drugs, feeds, and vaccines. Finally, farmers through the network are provided with extension services guiding them on the best-practice uses of inputs. Besides directly assisting farmers, the network also supported hatcheries by providing them with five incubators imported from China, and supported other input suppliers by providing soft loans.

3.8.4 Degree of Success and Key Takeaways

This case is interesting as, while an initial effort to create a multi-stakeholder "platform" failed after a few months due to non-participation, multi-stakeholder coordination was still able to occur through a multi-stakeholder network. Additionally, like in the other case studies considered, multi-stakeholder coordination resulted in the the creation of a market-governing intermediary. However, unlike the previous cases, this intermediary is a new private sector firm, which is not owned by any other pre-existing market participants.

In terms of long run success, the program has been rather successful in actually establishing a well-defined market system for obtaining inputs and outputs. It was able to help establish KukuDeal as a non-profit firm to sustain activities and provide market governance in the long-run. Yet facilitators do note that farmers may have less access to capital beyond initial platform activities, as much of the credit was provided by RIU in conjunction with KukuDeal. KukuDeal has continued its operations through 2016, and possibly after.

3.9 Cémoi's Transparence Cacao Program (Côte d'Ivoire, founded in 2015)[2][5]

3.9.1 Initial Coordination Failures

Costly technological innovation, contracting Frictions, lack of governance, asymmetric information

Cocoa and its affiliated products are a leading source of export revenues in Côte d'Ivoire. Yet, as a result of the extractive production process, there have been substantial negative environmental impacts including degradation of orchards, deforestation, and disease. If value chain members do not invest in technological solutions to source cocoa more sustainably, this industry will not be able to continue to exist in the future. Yet, this innovation is costly, involving research on new techniques and training of farmers in the use of these techniques.

Additionally, in Côte d'Ivoire, it is only legal for processors to contract with cooperatives, so that many farmers are members of cooperatives out of necessity. Yet these cooperatives often do not have effective governance structures, and cooperative leaders often lack crucial skills necessary to maintain proper records and negotiate deals with other value chain players. Finally, there are asymmetric information concerns from the processor's perspective regarding quality. In particular, a French processor called Cémoi was finding that the cacao supplied by these producers did not meet quality standards on a variety of hard-to-observe characteristics, such as "aromatic quality." This is likely due to farmers using poor production techniques,

which is challenging for Cémoi to observe and monitor. In addition, farmers are skeptical that a large foreign processor will adequately compensate them for production and quality upgrading.

3.9.2 Stakeholders

- *Producers:* 35 smallholder farmer cooperatives
- *Processors:* Cémoi
- *Facilitators:* Agence Française de Développement (AFD), Althelia, The National Agency for the Support of Rural Development [Ivory Coast], Ecotierra, The Sustainable Trade Initiative (IDH), Progreso, Technoserve, The Forest Trust
- *Credit Partner:* Rabobank
- *Research:* National Center for Agronomic Research (France), World Agroforestry (ICRAF)
- *Policymakers:* Conseil Cacao-Café (CCC), Ministry of the environment, urban health, and sustainable development in the Ivory Coast, Ivorian Office of Parks and Reserves (OIPR), The REDD-SEP program, Forest Development Society

3.9.3 Solutions

In response to these concerns, Cémoi founded the Transparence Cacao Program, in collaboration with various development and sustainability organizations, and 70 cooperatives. One of their partners, The Forest Trust, began the process by interviewing over 8,500 farmers to understand their production methods and livelihoods as well as to establish a trusting relationship. In terms of promoting environmental sustainability, Cémoi partnered with OIPR and Ecotierra to begin rehabilitating cocoa orchards, as well as with ICRAF to research more sustainable agroforestry models. Cooperative farmers were taught about the outcomes of this research and were instructed in how to carry out more environmentally friendly and productive practices, such as refraining from forest burning, sanitary harvesting of cocoa pods, conservation of shaded zones, maintenance of plantations, and use of compost made from cocoa pods. Additionally, so that farmers understand these environmental goals and are more likely to implement environmental practices learned in training programs, cooperatives were encouraged to establish social responsibility and environmental committees within themselves. Cémoi also implements the more heavy-handed method of banning the use of materials deemed environmentally dangerous in the production process.

Besides providing training on best production practices, the program also provides training in management and accounting to cooperative leaders to improve governance within cooperatives, as well as to reduce costs for Cémoi in contracting with cooperatives. To combat some of the trust concerns farmers have about being cheated by a large company, the platform instituted instant payments to farmers with mobile money. The program separates cooperatives into three different development stages, and for more developed cooperatives, the platform arranges with credit partners to provide banking services and loans to facilitate productive investments. Additionally, the program has developed farming schools as a way of “giving back” to the community to help give unemployed young adults the skills to improve their livelihoods and gain trust between Cémoi and producers. Finally, with regards to Cémoi’s asymmetric information concerns about quality, the processor developed three clear quality grades in consultation with CCC.

3.9.4 Degree of Success and Key Takeaways

This case is distinct from all the others presented in that neither outside facilitators nor smallholders of any type initiated the platform, but rather a large international processing firm acting as a lead agent for coordination in the value chain. Accordingly, at every stage of the process, collaborative efforts, and in some sense ownership of the program, were maintained by Cémoi, who enlisted other partners to help them with their efforts. This was made possible by the significant market power held by Cémoi both in relation to the cooperatives they work with and the country's economy in general.

The power dynamic (specifically the large disparity in market power between value chain actors) coupled with initiation of the platform by Cémoi makes this feel less like a multi-stakeholder platform in a traditional sense. Instead, it feels like much of this program is satisfying an overarching CSR (corporate social responsibility) objective by Cémoi. Moreover, it seems possible that Cémoi is not necessarily trying to optimize the way they contract with cooperatives in terms of efficiency, but rather optimize their consumers' perceptions of the quality of their sourcing with regards to ethical and environmental concerns.

4 Post-Platform Market Governance

These case studies evidence the importance of coordination in value chains to enhance efficiency and competitiveness. Coordination can be assumed by lead agents in the value chain (firms and cooperatives) or by multi-stakeholder platforms. Triggering these institutional innovations can be done by facilitators engaging in Big Push initiatives to increase the payoffs from coordination and increase beliefs in the likelihood of coordination by value chain stakeholders. If the only function of this effort is to provide a push to coordination, it may not be necessary to sustain it in the long run. In theory, value chain actors will use the impetus of the push to restructure themselves (if necessary) in order to make coordination sustainable. Within the case studies' sections of "Degree of Success and Key Takeaways," we have briefly alluded to some of the forms of market governance that persisted after a platform's initial formal activities ceased. Here, we attempt to further categorize these outcomes in terms of which actors play a dominant role in market governance in the longer term. A general characterization of these outcomes, and to which cases they apply, can be seen below.

1. Organized smallholder farmers act as lead agents in coordinating the value chain
 - Bubaare Innovation Platform Multipurpose Cooperative Society Ltd for sorghum (Uganda)
 - MilkIT Platform in Bageshwar (India)
 - Cowpea-Soybean Innovation Platform (Nigeria)
2. Multi-stakeholder platforms are setup to govern the value chain
 - Uganda Oilseed Subsector Platform
 - Poultry Sub-sector Innovation Network (Tanzania)
3. Commercial firms with market power act as lead agents in value chain governance
 - Cashew sector Agro Industrias Asociadas (Mozambique)
 - Cémoi's Transparence Cacao Program (Côte d'Ivoire)

4. Intermediaries (government, NGOs) sustain a key role in value chain governance

- MilkIT Platform (India)
- Monze Conservation Agriculture Platform (Zambia)
- Cadenas Agrícolas Productivas de Calidad (Peru)

We now review each possible outcome in greater detail.

A first possible outcome is that a multi-stakeholder institution like a platform is no longer necessary because members in each tier of the value chain organize within themselves, as well as with other value chain links in order to be able to trade among players in the value chain. Establishing horizontal coordination among particular value chain stakeholders (producers, processors) can be especially important in contexts where there is a scale issue, in that many individual producers each produce only small quantities. Organization of small-scale producers into a cooperative (like in the cases of Bubaare and MilkIT) can greatly help in facilitating transactions between small producers and other market players. However, the within-tier organization itself is just one element in these examples; the platform also helps to match producer organizations with other private sector value chain players, reducing matching frictions, and allowing these players to establish a trusting relationship (which parties are willing to initiate coordination given validation of a trusted intermediary's involvement). The process of establishing relationships between producer groups and private sector players was key in the Cowpea-Soybean platform in Nigeria, where initial contact between farmer organizations and agricultural input suppliers allowed them to jointly develop input package sizes that better suited farmers. Likewise in Bubaare, farmers and Huntex were able to create a new product taking into account each party's comparative advantage, and to build the trust to contract more formally in the future. Notably, all of these platforms seemed to have given small-scale producers and other private sector players (if applicable) a large role in the policy discussions from the very beginning of the platform, allowing them to foster strong enough relationships that trust in other players was able to outlast the initial "safety net" of having a trusted intermediary involved. In some sense, these cases result in the "ideal" outcome, if we believe that the platform's intended function is to serve as a temporary "big push" to induce coordination.

A second outcome is when the long-run existence of a multi-stakeholder market governance entity is necessary or desirable. For instance, smallholders in the Tanzanian poultry subsector suffered from many of the same scale and matching issues as cases in the previous paragraph. Yet, because in this case the value chain actors are geographically dispersed, it is quite difficult for them to contract directly in the long term. Hence in this case the value chain was upgraded by addition of a new private sector intermediary (KukuDeal) to maintain a well-functioning market. The Ugandan oilseed case fits into this category as well; before donor intervention the OSSUP platform was an existing entity that served a role in coordinating marketing behaviors and planting techniques between a vast network of producers and processors of various sizes. More so than in other platforms, this one aimed at setting sector-wide policies rather than just facilitating interactions between a few distinct value chain players, given the large size of the market and diversity of the final products produced. This is why it is preferable to have a long term multi-stakeholder institution. Yet, it is also possible that if it had been successful at overcoming coordination issues, the OSSUP platform in the longer term would have fallen into category one (in that it would facilitate strong stakeholder relationships and hence no longer be necessary). Yet given the first order problem of quelling the internal conflict regarding what the appropriate sector-wide policies should be, it was unable to deal with the other problems which made the platform necessary in the first place. Hence, having a sustained

intermediary or other multi-stakeholder structure in the longer term may be a logical conclusion in value chains with significant transaction costs (such as those due to geographical distance) or large scales (with many actors and diverse final product producers).

In these past two categories, we see some dispersion in the distribution of market power among players. This is what allowed various players to use the platform as an opportunity to coordinate rather than for one player to essentially “assert their will” over another. However a third case is, when market power is concentrated in the hands of one value chain player or a group of value chain players, it is sometimes more feasible that this institution takes on the role of long-term market governor. While at first sight this type of governance may seem suboptimal or inefficient, this may not necessarily be the case. If capacity of the lead firm is significantly greater than that of the small-scale producers, it may make sense in terms of comparing costs and benefits for the firm to assume the major role in governance given its comparative advantage in organizational capacity. For example in the Agro Industrias Asociadas (AIA) case, seven small plants jointly starting their own firm gave each a lot more market power than they would have had individually. This gave them the power to lobby for and help set industry policy, as well as access inputs and services that no other stakeholder could afford on their own. Hence it seems sensible in this case for other smaller processing firms to join this organization, as it is unlikely that they will be able to compete. Indeed, this seems to be exactly what happened in the long run; AIA eventually subsumed virtually all other small processors in the area. Likewise in the case of the Transparence Cacao, Cémoi is a large foreign firm dealing with poor, rural cooperative members. It is essentially in Cémoi’s best interest to govern activities between stakeholders because they have the capacity to easily provide resources to smallholder cooperatives that make these smallholders easier to contract with, that would be much more costly for the cooperatives themselves to obtain in the absence of Cémoi. Simultaneously, Cémoi is able to assert that their products are ethically and sustainably sourced.

A fourth category of outcomes, which is perhaps “not ideal,” is when the government or a not-for-profit intermediary retains a key role in value chain management in the long run. The reason is that theoretically the role of the intermediary is to provide a temporary push that helps market stakeholders overcome initial market failures, not one that takes over market governance forever. Hence, we might feel some skepticism regarding platforms such as CAPAC, which has local NGOs in a permanent role of facilitating transactions between small-scale potato producers and large scale processors with significant levels of market power. This suggests that there are still remaining impediments such that these parties cannot contract without the intermediaries; perhaps there is remaining mistrust between parties and remaining scale issues of smallholder producers not coordinating well enough among themselves. If contracting between these producers and processors is so excessively costly that a for-profit intermediary has not emerged, these transactions may not be efficient or optimal in terms of overall welfare. (Another alternative is that large processors with a lot of market power could profit from transacting with smallholders, but since they know the government has a vested interest in including small-holders in market chains, these large processors exert their market power to make intermediaries permanently shoulder some of the contract risk. This would clearly be an inefficient arrangement from the social planner’s perspective as well.) Additionally, there is a lot of reliance on local NGOs in this system, meaning that donor funds are still sustaining coordination, and a withdrawal of funds allocated to CAPAC could endanger the stability of the entire market. Even though donor funds are not involved, there is a similar sense of inefficiency with the MilkIT program in Almora. Farmers there continued to sell milk to the government, and platform activities allowed them to do so at an even higher cost to the government. Again, it is curious that no private intermediary or trader wants to take on this role,

making it seem as if even platform activities were not able to make these transactions profitable. Finally, it is worth mentioning the case of the Monze Conservation Agriculture Platform which also ended up getting subsumed by the government. Out of all of the platforms, this one feels the most like a one-sided government extension effort to get farmers to change their agricultural practices, rather than a platform to link market actors. This is the case for many “innovation platforms” found in this literature, but not detailed in this paper. Hence in this case, it seems unsurprising that the government ended up taking control over long-term platform activities.

Considering this typology of outcomes, it becomes evident that both pre-existing market dynamics and shifts in market power caused by platform activities are crucial in determining long-term value chain governance structures. If parties wielded significant market power before the platform and retain this market power, they are likely to assume a key role in governance. If parties initially lacked market power, but are afforded it through platform activities (for example when smallholders organize in a cooperative), they can gain a partial or complete role in market governance. Finally, if parties have little market power before the platform and are not awarded it through platform activities, then governance continues not to be a role of these parties, and instead falls to intermediaries or other players as available.

5 Policy Implications and Conclusions

In this paper, we have considered issues of coordination in agricultural value chains inclusive of smallholder farmers in developing countries. Other research has shown that value chains can be effective instruments for the modernization of smallholder farming and the agricultural and rural transformations of rural areas [3]. This research has shown that coordination in value chains is an important instrument to secure the competitiveness of a value chain and its ability to sustain investment, contracting, and trading. We have conceptualized coordination as an effort for value chain stakeholders to overcome market failures and government deficiencies, and sought to understand how facilitators can intervene to help value chain actors overcome these constraints using basic game theory as an underlying framework. To do this, we explored nine case studies in the context of a theory of change that describes coordination. Case studies vary greatly in terms of context, relevant actors, coordination approaches, and outcomes. In view of the multiplicity of approaches to coordination, we tried to understand and classify these outcomes in terms of the lasting value chain governance structures that resulted.

We see from this analysis that some value chain coordination efforts stand out as having more successful outcomes than others. Though the degree of success of each coordination effort is complex and based on a multitude of unique factors, several generic policy implications for future value chain coordination interventions arise as follows:

1. *Horizontal coordination in producer organizations can help achieve vertical coordination in value chains.* In many value chains that include smallholders, there are significant trading and contracting frictions between smallholder farmers and other value chain actors. While we framed our analysis in terms of understanding this vertical coordination between value chain links, in many cases we see that horizontal coordination is critical to enable vertical coordination. For example, in cases like the Bubaare platform, once smallholders were able to organize into a cooperative, it became possible for them to contract directly with small processors like Huntex. This need for horizontal organization does not just apply to small farmers; we saw in the Agro Industrias Asociadas case that horizontal coordination between processors allowed each processor to access the critical inputs and extension services that they needed,

making them more easily able to contract with foreign cashew buyers. The Cowpea-Soybean Innovation Platform is an example of success where both smallholder farmers organizations and input suppliers took the initiative of sending delegates to meet each other and establish a trusting relationship, such that platform facilitators would not have to be accountable in the long-term for making sure the two parties would be able to contract with each other. With this the case, it is important for facilitators to learn how to help producer organizations use their capacity for collective action to become effective lead agents in value chain coordination.

2. *Lead commercial agents in value chains are often the easiest approach to coordination, but at cost on others.* We have seen that lead commercial firms in value chains can easily assume the coordinating function, especially for value chain investment and to achieve the sanitary quality norms demanded by urban and foreign consumers. The monopsony power of these firms allows them to internalize the benefits of coordination, securing a return to private investment in value chains club goods. The risk of convenience in coordination is however loss of control over quality norms set by the lead private firms, and a trade-off between the cost to producers of monopsony pricing and the benefits of coordination. This is particularly notable in value chains for exports of fresh produce, such as tomatoes in Morocco and Turkey, where major European firms have assumed control over domestic value chain coordination [14]. Risk in this approach is that the dominant agent assumes a principal-agent position, reducing smallholder producers to their participation constraint with no effective gain from coordination.
3. *Permanent multi-stakeholder platforms are difficult to achieve but perhaps the best option for equitable sharing of the net social gains from coordination.* Putting into place multi-stakeholder platforms that elicit the participation of all actors in the value chain is in principle the most effective way of achieving sustainable cooperation, as demonstrated by Ostrom (1990) for resource managing institutions. Democratic practices in platform management can secure equitable sharing of the net social gains from coordination. Yet, these platforms are difficult to put into place and use effectively, in particular because some value chain players have more capacity than others in fulfilling contract obligations and duties assigned to them. Coordination facilitators such as the CGIAR, with its broad multidisciplinary capacity and field presence, have had major roles to play in helping their emergence. Difficulty is to transit to a self-sustaining platform that does not rely on facilitator tutelage.
4. *Coordination sustained by third-party facilitators are at risk of discontinuities of support.* We have seen that several multi-stakeholder platforms need the continuous support of government or NGO as intermediary agents in order to exist. This is the case such as with CAPAC in Peru, where neither smallholder farmers nor large processors were accountable for making sure their contracts continued to be enforced or for implementing quality control. Instead, this job ended up falling on local NGOs that then have a permanent role in sustaining contractual obligations. Risk is that discontinuity of intermediary support lead to collapse of the coordination effort. Important in this case is for this transitory situation to evolve toward one of the above three cases that can secure sustainability

While these policy implications might serve as helpful starting point for future interventions by coordination facilitators, there is much more to be considered when designing optimal interventions. Our case studies illustrate wide differences in the specifics of each given context that must be taken into account. More explicitly, the full set of market and government constraints that motivate coordination efforts need to be understood in order to overcome these issues in a contextually appropriate way. Additionally, there remains

much more to be learned about the effectiveness of lead agent coordinating roles and multi-stakeholder platforms. In future work, it will be important to develop quantitative methods to rigorously assess the impact of these coordination-related interventions, and of specific design facets of these interventions. Our work here in contextualizing these interventions within an economic framework, and pointing out key questions for research, will ideally help better motivate this future analytical work.

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6 Appendix: Reference Documents Containing Case Studies of Multi-stakeholder Coordination (Considered, but not discussed in this paper)

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