

How Can Agricultural Value Chain Finance (AVCF) Help Expand Financial Access for Smallholder Agrifood Chains in Southeast Asia?

Alan de Brauw

International Food Policy Research Institute

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How Can AVCF Help Expand Financial Access for Smallholder Agrifood Chains in Southeast Asia?

Introduction and Context

Smallholder farmers in developing countries face several different constraints limiting their ability to reach their production potential. One such constraint is access to formal finance; smallholders and other agricultural value chain participants frequently cannot access credit necessary to invest in new crops or technologies, deal with risks and shocks, and or savings products to safely carry wealth from harvest to planting. New technologies, markets, and government priorities in several Southeast Asian countries combine to suggest new opportunities are emerging to overcome long-standing challenges to expanding agricultural finance: Those challenges include:

- (i) high transaction costs to financing in rural areas;
- (ii) managing risks unique to agriculture; and
- (iii) knowledge about how to deliver agriculture-based products.

Yet new technology will neither fully eliminate barriers to increased production nor improved resilience against shocks if farmers lack markets for additional output, or if financial providers lack sufficient information to assess potential clients, supervise loans, and address risks. As such, incorporating digital technologies into existing models of whole-of-value chain agricultural finance, or agricultural value chain finance (AVCF) is a potentially attractive approach to increased smallholder farmer returns, financial viability and resilience, and improved livelihoods.ⁱ

AVCF can act as a mechanism that blends relational contracting with more formal contracting that is observed in modern value chains.ⁱⁱ A standard AVCF scheme allows a formal lender (e.g. a bank) to lend to a single enterprise (e.g. a processor), which then buys crops from individual farmers. The relationship between the enterprise and farmers can act as a substitute for more formal collateral provided by the farmers. The enterprise can more effectively monitor and screen farmer and provide the individualized loans that banks find too costly to make, while the bank retains the ability to make a formal loan to an enterprise that has business that is easier to understand for its loan officers.

This paper summarizes some of the learning from Phase 1 of the Innovative Financial Services for Agriculture (IFS4Ag) project, being conducted in Indonesia, Myanmar, and Viet Nam with primary funding

from the Australian Centre for International Agricultural Research. In each country, project teams have produced a report describing the agricultural and policy environment, and the potential for AVCF by value chain. Within the report for each country, policy recommendations are made that suggest policies that would help facilitate AVCF or agricultural finance in general.

Quite generally, the three countries are at different stages of development, which broadly affects the types of opportunities available. In Myanmar, the agricultural sector is still characterized by a substantial yield gap with other countries in the region, implying that farmers need improved agricultural inputs for virtually any crop. Given its proximity to the two largest consumer markets in the world (India and China), it also has strong potential to grow exports, so long as products can attain quality standards for those or other potential export markets. In Viet Nam and Indonesia, opportunities for AVCF are more inward looking, as in both countries urban incomes are growing rapidly, along with demand for more high value agricultural products. If their access to finance remains constrained, such farmers will have a difficult time participating in those markets.

That said, there are some threads that run through the three country studies that are worth bringing together. First, we describe the necessary conditions for AVCF to be a viable way of expanding credit access among smallholders. Second, the paper describes the level of and method of government involvement in credit markets in the three countries, comparing and contrasting how the interference may affect the quantity and quality of credit available for smallholders, and third, we describe how digital technologies can and potentially should be used as a tool for enhancing AVCF. The final section concludes with some potential solutions.

Key Factors for AVCF to Thrive

In each of these three countries, AVCF has obvious potential to help support more smallholder involvement in value chains. It is first useful to consider consider the factors that might make AVCF successful. First, we should consider how it fits into a framework related to models of farmer-buyer transactions.

From the buyer's perspective:

- (i) they can purchase products on spot markets;
- (ii) they can enter simple formal or informal contractual relationships with buyers; or
- (iii) they can aggregate land and vertically integrate.

Since relationships are necessary for AVCF to occur, the formal or informal contractual relationships must be present for AVCF to occur.

More broadly, the question we want to pose is what conditions are necessary for AVCF to emerge as the dominant model for those transactions, rather than one of the other forms of relationships. We distinguish seven factors that can play a role in determining the form of these transactional relationships, particularly in a context when a smallholder must adopt a specific technology to enter the relationship.ⁱⁱⁱ Specific technologies could include growing new crop varieties that either enhance productivity, facilitate processing, or both; adopting new breeds of livestock and/or livestock feeds; or adopting new crops that can produce more revenue per hectare.

Key Factor 1: Additional Value Produced in Adoption

From the perspective of the value delivered at the retail end of the value chain, the additional value of farmer adoption of a new technology must be large enough to make engagement in AVCF attractive to farmers, the aggregator, and the bank.

- Value can be created by increasing product quality (such as meeting a certification); increasing productivity; creating links to a new marketing opportunity; or producing something new altogether.
- The larger the value difference between the new product and the old product, the more potential for additional actors to make money in the chain; note this value need not be added at the farm level, as it could also be added through new processes adopted by actors operating between the farm gate and inclusive of processing.
- A larger increase in value leads to positive incentives for engagement, whether in relational or formal contracts, between farmers and aggregators or processors beyond spot markets.

Key Factor 2: Risk

All agricultural production is risky, but products with higher value (such as fruits, vegetables, and animal source foods) often involve additional risks, and farmers that decide to grow new crops or attempt to attain specific qualities in their crops are exposed to new forms of risk.

- When additional risks are present, incentives to spread them through contractual relationships increases, whether they be through direct contracts or AVCF relationships.

- That said, contractual relationships also create risk among purchasers, particularly if they lack market power. Farmers can decide to break contracts and sell to others for higher prices if they become available.
- For perishable products, value chain actors beyond the farm gate take on spoilage risk along with delivery, so timing of transactions is important.

Key Factor 3: Credit Constraints

Credit constraints can play an important role in the viability of AVCF, beyond just credit constraints among smallholder farmers.

- If processors, collectors or traders can self-finance contracts for inputs with farmers, and take on risk, then they have no incentives to go beyond existing or traditional contractual relationships with farmers.
- The risk-reward relationship between farmers and other chain actors including processors, is therefore conducive to AVCF if risks to borrowing money outweigh risks to self-financing loans to smallholders.

Key Factor 4: Level of Competition

The level of competition both within the value chain and within the financial sector as directed towards agriculture may affect the potential for AVCF.^{iv}

- Within value chains, if middlemen or processors have too much market power, farmers may not adopt the new technology because the risk adjusted returns do not outweigh the more certain returns of their current technology.
- Similarly, if only one source of finance or bank is available in a specific area, then the cost of finance rises for farmers or for other value chain participants, as the bank can extract higher rents from value chain participants in need of credit.

Key Factor 5: Timing of Payoffs

The timing of investment payoffs can matter a great deal to whether specific technologies require either contractual relationships in general or AVCF specifically, so long as vertical integration is not possible.

- This factor is best considered through an example, such as tree crops. They typically take years before they begin to produce revenue. They also involve opportunity costs on behalf of farmers, who lack income while trees are maturing.

- If farmers making such investments have a dedicated buyer once their trees are mature, that can help fund the establishment costs and lead time to productivity, it reduces the risk of such investments.
- Buyers, however, may not have access to capital to make such long-term investments, while banks or investment vehicles might.

Key Factor 6: Cooperatives and Other Institutions

Cooperatives or farmer organizations, and other institutional features of economies can play an important role in the viability, or lack thereof, of AVCF. Two such factors are property rights over land and the presence of farmer organizations such as cooperatives:

- If land is not easily bought or sold, vertical integration is not possible, as companies that want to vertically integrate cannot legally acquire land.^v However, note that without adequate land rights it cannot be used as collateral, also hindering finance.^{vi}
- Cooperatives can play an important role in AVCF as they can facilitate information provision to farmers, distribute inputs, track individual loans, and aggregate products for downstream actors, potentially reducing transaction costs. But weakly governed cooperatives can exacerbate risks of working with individual smallholders, as group leadership cannot guarantee transactions with the group as a whole.
- Other institutions, such as historical relationships between agriculture and the financial sector can also shape AVCF potential.

Key Factor 7: Financial Sector Regulations

Financial sector regulations can also hinder AVCF or agricultural finance in general, as governments are typically aware that financial access is a challenge in rural areas and credit is not as available in agriculture as other sectors. In the next section, we discuss government involvement in agricultural credit markets in more detail, focusing on Myanmar, Indonesia, and Viet Nam.

Government Involvement in Agricultural Credit Markets

Credit markets, not just agricultural credit markets, tend to be regulated by governments. Governments typically play the role of ensuring that financial institutions carefully track deposits, charge the interest on loans that they state beforehand, and maintain reserves so that they continue to be solvent. They also regulate entry into financial markets. Governments do not just regulate credit markets; in fact, in all three

countries studied in the IFS4Ag project—Indonesia, Viet Nam, and Myanmar—many or all of the largest banks are government owned.

In all three countries, financial access and depth are challenges both in general and in rural areas more specifically:

In Myanmar, only 26 percent of individuals have bank accounts and domestic credit to the private sector was only 25.7% of GDP.

In Viet Nam, 32 percent of individuals have bank accounts, but credit was relatively deep, as domestic credit to the private sector was 137.9% of GDP.

In Indonesia, 52 percent of individuals have bank accounts, while private sector credit only represents 37.8% of GDP.^{vii}

Since urban dwellers are more likely to have access to banks, and the private sector is concentrated in urban areas, these figures are surely lower in rural areas.

Since agricultural credit markets are even thinner than credit markets in general, governments often use further regulations or interventions to attempt to increase the supply of credit to agriculture. These interventions can be categorized as establishing agricultural banks, and interest rate regulations. Collateral regulations can also play an important role in helping or hindering AVCF.

Agricultural Banks

One way several countries have intervened in rural credit markets is by establishing an agricultural bank, with branches in rural areas to lower transaction costs to serving farmers. In fact, each of the countries in our study has or had an agricultural bank. In Myanmar, the Myanmar Agricultural Development Bank and Myanmar Economic Bank have combined to play that role in the past. In Viet Nam, the agricultural bank is the Viet Nam Bank of Agriculture and Rural Development (VBARD). In Indonesia, there is not currently an agricultural bank, but Bank Rakyat Indonesia (BRI) was set up as an agricultural bank.

While agricultural bank branches reduce transaction costs to establishing bank accounts or obtaining credit, they have several potential drawbacks:

- Agricultural banks are often the only bank in a rural area. In absence of other regulations, theoretically a credit monopoly will decrease credit supply and increase prices (interest rates)

relative to the market rate. As a result, they may not offer credit terms much better than informal money lenders often present in rural areas.

- Similarly, they need not offer market level interest rates on savings, therefore reducing incentives for rural residents to establish bank accounts, particularly given the spatial dispersion of villages.
- If, and when, agricultural banks are privatized they maintain that monopoly position.

So although agricultural banks are a useful way to improve credit access in rural areas, they may not be a panacea for agricultural credit.

Interest Rate Regulations

All three countries in the IFS4Ag study restrict interest rates in ways that affect agricultural credit markets.

In Myanmar, all loan interest rates by commercial banks are capped at 13 percent when collateralized and 16 percent when not, while microfinance institutions can lend at 28 percent, for loans of up to MMK 10 million (\$7610). Commercial banks largely find these rates too low to make profitable loans, so almost all lending in agriculture has been made by MFIs or cooperatives.^{viii}

In Viet Nam, VBARD and the Viet Nam Social Bank for the Poor (VSBP) are both mandated to make agricultural loans at below market interest rates; VBARD charges 1 percent per month and VSBP 0.7 percent per month, significantly lower than the non-state-owned commercial banks. In fact, according to the 2018 VHLSS survey 65 percent of all loans to the poor are made by VSBP, and another 15 percent by VBARD.

In Indonesia, the government makes agricultural credit more affordable through subsidies to banks on *Kredit Usaha Rakyat* (KUR) loans. KUR loans are subsidized by the government, in that borrowers are charged an interest rate below the market rate (6 percent), and the government pays the difference to the bank. For micro KUR loans, which are defined as loans below Rp 25 million (\$1,782) with a maximum length of 2 years, no collateral is necessary. Retail KUR loans range from Rp 25 million (\$1,782) to Rp 200 million (\$14,261), can be 3 to 5 years in length, and require some collateral.

The structure of Indonesia's KUR loans makes them less market distortionary than interest rate ceilings for agricultural loans because the banks continue to receive the market interest rate; when there is an interest rate ceiling, supply might be limited. However, KUR loans are not targeted to agriculture or agricultural businesses, so the majority of KUR loans go to non-agricultural businesses.

Collateral

Restrictions on collateral remain a challenge for agricultural lending in all three countries. There are several good reasons:

Land Policy: In Myanmar and Viet Nam, all land is owned by the government, and farmers therefore only have land use certificates that can be used as collateral. However, not all households have land use certificates for the land they use (Bellemare et al., 2020), making it impossible to use as collateral.^x

Policy Confusion: Bank officials are often confused about regulations around collateral. In Myanmar, until recently banks misunderstood regulations and thought they could not loan more than MMK 1.5 million (\$1141) to farmers.^x (Moyes and Shwedel, 2017).

Poor Credit Scoring: in Indonesia and Viet Nam, banks are often risk averse in their lending, in part because they lack the ability to assess potential creditors. As a result, lending without collateral is limited, and in fact banks sometimes require collateral for loans that are not required by policy.^{xi}

In fact, financial institutions may have more than just difficulty assessing credit risk of individual borrowers; they may just be too unfamiliar with agriculture to feel comfortable lending to agricultural enterprises. This problem appears acute in Myanmar, where banks and other lending institutions may lack capacity to assess agricultural developments or enterprises in general. Similarly, in Viet Nam where VBARD and VBSP dominate lending and branches throughout the country, other banks likely lack much capacity to assess agricultural lending or even agribusiness lending.

Promising Technologies

New information and communication technologies (ICTs) have at least two potentially important roles in AVCF in the three IFS4Ag countries and beyond. While the spread of cell phones and smartphones is a vehicle for these technologies, the increased use of GPS and satellite photos is another, and many of the real innovations relate to software making use of new hardware. ICTs can reduce some of the transaction costs and reduce risks to some parties within agricultural value chains, making possible investments that might not have been otherwise. ICTs can also help increase competition in financial markets, among other potential benefits; however, it is important that they not be seen as solving all potential challenges in setting up AVCF.

Transaction Costs: There are several ways transaction costs can be lowered by ICTs. Cell phones can link producers to traders, helping producers find better prices, and they can reduce information costs about how to grow specific crops. Niche markets can grow as a result. **In Indonesia,** several schemes are already

in place (Crowde, TaniHub) to provide new linkages between producers and off-takers, or to provide investors with opportunities within agriculture.^{xii}

Risk Reduction: Distributed ledger technologies (blockchain) imply product traceability throughout the value chain, so bad actors can easily be observed and problems can be traced back to their source.^{xiii} Index insurance can also be improved through pictures of crops taken by farmers.^{xiv} The presence of cell phone technologies makes it easier to monitor what is going on in fields from the perspective of either buyers or lenders, reducing the cost of obtaining information and reducing the value of hiding it.

Increased Competition? Increased use of ICTs can potentially add competition to financial markets. As discussed, agricultural banks are set up to deal with credit constraints in rural areas and the lack of financial institution presence, but they become local monopolies as a result. Technologies can potentially make available additional financial institutions or options, creating competition between entities with and without a physical presence.

Other ICT Uses: Other uses of ICT in AVCF are also possible. For example, cell phone histories can be used effectively in credit scoring.^{xv} However, putting that into practice requires both establishing it would work in other contexts, and financial regulators to approve that use.

Technology is not a magic bullet: Though there are plenty of potential uses of technology that can help agricultural value chains work more efficiently, studies have also shown that technology is not a magic bullet. Technologies must be designed well for their purposes; in other words, apps should be designed intuitively and/or with an appropriate literacy level in mind. Whereas the world is now awash in cell phones, fast internet access is necessary for farmers to be able to access videos, and reliable access is necessary for farmers to observe market prices or access other farming information. That said, ICTs have serious potential to help lower agricultural extension costs, crop monitoring, speed up payments, connect buyers to sellers, and improve traceability.

Fostering AVCF Development

Given the discussion above, the three IFS4Ag country studies are all good candidates for the development of AVCF models. To foster that development, some policy pointers could require further attention:

- Agricultural loans, by nature, have different requirements than non-agricultural loans. Revenues tend to be lumpy, occurring at one or two points in the year; liquidity requirements are typically short term (weeks, months) rather than long term, except for tree crops; and weather plays a

different role in determining risk. Policies can hinder agricultural lending if they require consistent payments, unsuitable loan terms (too short or too long relative to crop and cash flow cycles), or do not consider risk.

- It is important to clarify collateral requirements for agricultural lending; if loan officers are confused about requirements, they may hinder borrowers from obtaining credit. Moreover, technology should make it possible to develop improved credit scoring and new types of collateral; governments should encourage this development.
- ICTs can be useful tools in catalyzing agricultural growth. Again, regulations such as caps on mobile money transfers can hinder their use in agriculture. Ensuring the appropriate use of technology to enhance financial options for farmers should be an important role for regulators in all three countries.

Summary

To be successful, AVCF requires improvements to existing credit constraints, a relatively large amount of value to be created above the status quo, the ability of lenders to understand, assess and viably price substantial production or marketing risks that no single actor would like to face, and appropriately designed lending products for traders or processors that support on-lending to farmers. These features are all present in some value chains in all three IFS4Ag countries; perhaps these conditions are present in more value chains in Myanmar than in Viet Nam or Indonesia, as the yield gap there is larger. Still, each of these economies also share institutional characteristics that can foster AVCF. In Myanmar and Viet Nam, property rights over land are incomplete, which rules out vertical integration. In Indonesia, the complex role of the state in the economy makes AVCF feasible particularly for agricultural products that are less amenable to plantations.

Increasing access to ICTs through expanding mobile telephone networks and smartphone technology create potential for new distribution channels for lower-cost financial products addressing the unique needs of agriculture.^{xvi} Indonesia has started this process, as the Financial Services Authority (*Otoritas Jasa Keuangan*) has been cautiously approving new financial products that are already helping some farmers find new markets and finance options. In Viet Nam, the State Bank of Viet Nam should consider how to allow current mobile money options to enhance financial inclusion in ways that facilitate agricultural lending. In Myanmar, current transaction limits on mobile money likely hinder its use in facilitating

contract farming or AVCF. Considering ways to change regulations to facilitate the use of mobile money in lending could help relax constraints on producing higher value goods.

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Endnotes

ⁱ Agricultural value chain financing refers to the practice of using relationships within agricultural value chains to provide formal finance. The canonical example is when a bank lends money to a processor, which then either lends to or provides inputs to farmers within its supply chain with whom they have a prior relationship.

ⁱⁱ See, for example, Michler and Wu (2020) and Barrett et al. (2021).

ⁱⁱⁱ These factors are derived from those discussed by Swinnen and Kuijpers (2019).

^{iv} See Macchavellio and Morjaria (2020) for an experiment related to this condition.

^v Otsuka, Nakano, and Takahashi (2016) discuss this constraint in detail, as it is common in transition economies.

^{vi} See Feder and Feeny (1991).

^{vii} These figures come from Demircuc-Kunt et al. (2018) and the World Development Indicators (2021). For the ratio of private sector credit to GDP, a measure of credit deepening, it is useful to note that the OECD average is 144.6% of GDP.

^{viii} See Basu et al. (2020).

^{ix} Bellemare et al. (2020) study this point in Viet Nam. Note that incomplete land rights may help the development of AVCF, since companies cannot easily vertically integrate growing and processing by acquiring land.

^x See Moyes and Shwedel (2017).

^{xi} See de Brauw et al. (2020) and de Brauw et al. (2021).

^{xii} References here include Jensen (2007) and Aker (2011).

^{xiii} Distributed ledger technology is a system for recording transactions related to assets in which transactions are recorded in multiple places at once. Therefore, simultaneous access and validation can take place among multiple individuals and removing transactions from ledgers is nearly impossible.

^{xiv} Index insurance refers to insurance that is written against a measure correlated with production losses, such as rainfall or vegetation levels assessed by satellite. Index insurance on its own may not be attractive to farmers, given the chance it will not pay off even with a shock, but by adding geo-tagged pictures of crops taken by farmers typically indemnity-based insurance can be replicated (Ceballos et al., 2019).

^{xv} See Bjorkegren and Grissen (forthcoming).

^{xvi} See Nakasone et al. (2014) for a more complete argument.