Investment Enablers for Spices and Horticulture Value Chains in Kota Division, Rajasthan, India

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Lion's Head Global Partners

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INVESTMENT ASSESSMENT

Lion's Head Global Partners

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I. EXECUTIVE SUMMARY

India has undeniably made tremendous progress in its economic development over the last two decades. Much of this advancement has been done in collaboration with development partners such as the World Bank and others. For example, the Pradhan Mantri Gram Sadak Yojana (PMGSY) project to build road networks in various regions including Rajasthan has created the potential for Development Corridors, which can become the catalyst for further development and investment. These corridors can form the backbone of economic clusters that offer a sustainable model for further progress in a number of industries.

Agriculture remains at the heart of the Indian economy. While its share of GDP has fallen from over 50 percent to somewhere in the region of 15 percent, it remains a significant contributor to overall growth and more critically remains the largest employer in the economy and the main source of income for a large part of the population. Catalyzing investment and further development in agriculture has significant potential for reducing poverty, in particular in the rural economy.

This project, 'Investment Enablers for Spices and Horticulture Value Chains in Kota District, Rajasthan, India,' is focused on the potential for using the Development Corridors created by the roads infrastructure in order to catalyze further investment in agriculture. The project is targeted geographically on Rajasthan, and specifically Kota division, but it is expected that lessons learned will be scalable and applicable in other locations and situations.

Governments in all major economies spend significantly on agriculture. In that respect, India is not different. There is wide array of government initiatives to support agriculture in the form of subsidies, schemes, and policies including a priority-lending requirement from the Reserve Bank of India (RBI) for banks to lend a certain portion of their portfolio into the agribusiness sector.

Any investment proposition needs to work with the existing financing ecosystem of banks, funds, and the government. Ideally, the development community can help address gaps in the current financing infrastructure or look for ways to enable existing customers to access it more readily.

An analytical framework for the Development Corridors is created by breaking down the value chain for agriculture and identifying the key stakeholders, gaps, and opportunities at each stage. This is outlined in Figure 1 below.

Figure 1 – Agriculture Value Chain

In Kota division (including the districts of Kota, Jhalawar, Bundi, and Baran), the spices (coriander) and horticulture (oranges/mandarin) value chains were selected for application of the Development Corridors model. Then, through a top-down analysis of the fundamental business issues at each stage and a bottom-up engagement with key stakeholders, we formed some very specific conclusions on the gaps that exist in the agriculture sector broadly and in Kota division in particular. These conclusions are used to form a set of financial interventions that are directed at the key problems.

The design of the interventions takes into account the realistic amount of funds needed for a regionally targeted facility and the need to ensure that the facility can have an appropriate governance structure without creating expensive overhead or a cumbersome management structure. One of the challenges facing stakeholders in the production phase is that often the available sources of capital are unable to be deployed in a timely manner. Since farmers often need funds to coincide with specific events, late disbursement can render them useless.

Starting from the premise that there are no silver bullets in catalyzing agriculture investment, the recommended initiative has made some assumptions on the priorities for the use of capital and on how it can be allocated to specific projects. While acknowledging that this subject is vast and complex, a consensus can be built around a number of general themes, which, if tackled successfully, can enhance the agriculture model and enhance rural livelihoods. Box 1 presents key recommendations for each phase of the value chain and Table 1 summarizes the content of this Report.

BOX 1: SUMMARY OF KEY RECOMMENDATIONS

1. *Production*
   - Use regulatory framework for FPOs to build successful aggregation models and enhance investment at the production stage (See Regulatory Assessment)
   - Explore Early Stage Fund financing
   - Focus on developing strong leadership and a viable business plan for FPOs
   - Explore whether an alternative aggregation model could be designed alongside FPOs in a way that attracts bank financing and links to other key stakeholders across the value chain
2. *Storage/Logistics*
   - Explore where the funds could come from to build the necessary infrastructure; options include government/development partners or additional funds from other sources if they can be raised
   - Explore Public Private Partnerships, looking to the grain silos model in Punjab to assess potential in Rajasthan
   - Work with financial intermediaries to understand their appetite for the agribusiness sector
3. *Processing*
   - Identify possible opportunities for processing, including grading, packaging, and sorting, and then create a process to attract a strategic investor that can bring capital and expertise into Kota division
   - Explore opportunities for a foreign strategic investor to play a key role in building the orange/mandarin value chain
   - Explore further possible financial incentives to attract strategic investors such as tax breaks or the availability of capital at concessional rates
4. *Market*
   - Create opportunities for new mandis with a sustainable business model and a management team committed to its success
   - Work with existing mandis to build better storage facilities and better links to farmers, including the Ramganj mandi in Kota and Bhawani mandi in Jhalawar
   - Build new retail models with large players such as Reliance or foreign players such as Walmart; explore their interest in vertical integration to see whether they can enhance other parts of the value chain, and address existing gaps (such as online sales from retailers with multiple merchants)

TABLE 1: SUMMARY OF KEY INTERVENTIONS

Issues	Current Status	Options
Production		
▪ Fragmentation is one of the biggest challenges in Indian agriculture ▪ Building scale also is a key challenge in the production phase of the value chain; the models used by NGOs to aggregate farmers from villages will need to be scaled up further and become commercially self-sustainable ▪ Developing sustainable aggregator models is crucial to enabling farmers to participate effectively in markets, providing access to resources that might be used for investment, and enhancing benefit from efficiencies and economies of scale ▪ In addition to regulation, strong management teams with independent governance and robust and flexible business models are required ▪ Access to capital and technical assistance are essential	▪ Several aggregation models exist and have been tried in Kota, Rajasthan, including Farmer Producer Organizations (FPOs); there are about 11 FPOs are in Kota and 11 in Jhalawar, promoted by different bodies including NABARD, SFAC and the Department of Agriculture, Government of Rajasthan ▪ Other models include the Gram Unnati Foundation and possible Special Purpose Vehicles that serve as aggregators (for example, a farmer services platform) ▪ There is wide array of government initiatives to support agriculture, including a requirement from the RBI for banks to lend certain portion of their portfolio into the agribusiness sector (priority sector lending requirement) and a number of regulatory and support (subsidy) measures ▪ The current evidence shows that other ancillary businesses in the	▪ Use regulatory framework for FPOs to build successful aggregation models and enhance investment at the production stage (see Regulatory Assessment for detailed recommendations) ▪ Early Stage Fund financing (see Figure 2) ▪ COEs could serve as knowledge dissemination/training hubs ▪ Recognize that successful FPOs need start-up capital coupled with strong leadership and a viable business plan (the Policy and Process Guidelines for Farmer Producer Organization issued by the Department of Agriculture and Cooperation (DAC), Government of India provide some guidance) ▪ Explore whether alternative aggregation models can succeed alongside FPOs ▪ Explore whether an aggregation model could be designed from scratch in a way that it attracts bank financing and links to other key stakeholders across the value chain; it is possible to design

▪ Cooperatives and other models from the past have not been successful; new models can draw upon lessons learned ▪ Irrigation models that can enhance productivity must be built ▪ Need to explore whether more capital or broad-based assistance is required (or what balance should be struck); need to explore the capacity of the government to provide capital and/or broad-based assistance and to what extent ▪ State Government can play a vital role in building institutions that can provide training and technical support	production sector, such as insurance, remain uneconomic if they fail to build scale ▪ Crop insurance is a heavily subsidized sector and faces limitations in terms of private sector participation and competitiveness ▪ Centers of Excellence (COEs) in Kota division are focused on citrus; also include pomegranate and other horticulture crops ▪ Efforts currently are being made by the Rajasthan Government through collaboration with organizations like the Small Farmers Agribusiness Consortium (SFAC) to support FPOs through finance, infrastructure, and knowledge support, and can be further enhanced to meet the needs of specific aggregation model. ▪ In Andhra Pradesh, IFC is working with the Andhra Pradesh State Cooperative Bank to broaden the range of products that can be offered for small farmers. These include both savings and lending products	the theoretical framework for such an entity, but to move this theory to reality, it is necessary to show that it needs capital, management, and a commercially viable business model, in addition to a sponsor

Storage and Logistics		
▪ Warehouses and cold storage facilities need to be upgraded and updated ▪ Remotely located storage facilities often are uneconomic, creating the issue of unsustainability ▪ Rural roads need to be improved to create better access from particularly remote areas and to enable produce to be transported without damage ▪ Creation of private sector players in storage and logistics needs to be encouraged further; these need to be able to build commercial business models and then be encouraged to invest profits in the sector ▪ Access to power is critical for technology based cold storage solutions to operate efficiently ▪ Farmers must be encouraged to experiment with renewable energy where appropriate; solar-based energy solutions are being developed by startups and private companies in Rajasthan, and supported by the	▪ Numerous private companies providing storage in Kota (particularly for coriander); models include comprehensive solutions that provide warehousing along with post harvest management solutions including insurance, cold chain, collateral management, and bulk procurement ▪ A number of successful public private partnership projects have been executed in India, for example, the grain silos project in the Punjab where IFC acted as transaction advisor ▪ Fiscal incentives for establishing and operating cold storage facilities are offered by the government, the main among which are: o Capital Investment Sub sidy for Construction/ Expansion/ Modernization of Cold Storages and Storages for Horticulture Products under National Horticulture Board o Section 80-IB of the Income Tax Act provides deductions in	▪ Explore where the funds would come from to build the necessary infrastructure; options include government/ development partners or additional funds from other sources if they can be raised (there will not be enough funds to meet every need, and hence a mechanism is needed to establish priorities) ▪ Private sector participation will be possible in the investment process if these projects are seen to be commercially attractive; if the models are not sufficiently commercial, then additional incentives will be needed to attract private businesses to the region ▪ Explore Public Private Partnerships, perhaps looking to the model in Punjab to assess potential in Rajasthan ▪ Expand the reach of the storage and logistics network, including through additional road infrastructure and transport services ▪ Throughout the value chain, work with financial intermediaries to understand their appetite for the agribusiness sector; banks should be seen as part of the solution not the cause of the problem (challenge is not to identify why banks will not

Government (Rajasthan Solar Energy Policy) ▪ Access to farmers and application in rural areas must be improved	respect of profits from industrial undertakings related to Cold Chain; for the first five years, the deductions are at 100 percent and then at 25/30 percent for next five years ○ Under Section 35-AD of the Income Tax Act 1961, deduction at 150 percent is permitted for expenditure incurred on capital investment in setting up a cold chain facility ○ Cold chain projects are eligible for External Commercial Borrowings	lend more to this sector, but to explore how agribusiness models can be made more attractive to banks)
Processing		
▪ Build processing facilities across the value chain ▪ Standards are increasingly important as new markets develop and consumer preferences change; they need to be implemented and maintained better to improve export potential ▪ Encourage companies to build processing facilities either as their own investment	▪ Juicing plant in Maharashtra, where a new plant is being financed by Pepsi Co, Cargill, and some local investors ▪ The Indian Government announced under the Union Budget 2016-17 that the agro processing sector will be opened fully to foreign investment ▪ Agro-processing and agri-marketing are identified as thrust sectors under the Rajasthan Investment Promotion Scheme, 2014 (RIPS 2014) and higher	▪ Possible investment by a strategic company involved in citrus or fruit juice to build a value chain around the Rajasthan orange/mandarin crop that could reach all the way back to the farmers and ultimately to facilities that process fruits, such as juicing facility or pulping facility ▪ Identify possible opportunities for processing or packaging and sorting, then create a process to attract a strategic investor that can bring capital and expertise into the Kota region; such a company could be at the hub of building out a

or, where appropriate, as Public Private Partnerships ▪ Ensure processing companies and other value added activities have strong links into other parts of the value chain	incentives and exemptions are available to the units in this sector: o Enterprises engaged in post-harvest crop activities that do not have VAT/CST liability can benefit from five percent Interest Subsidy for five years ▪ The Rajasthan Agro-Processing and Agri-Marketing Promotion Policy, 2015 also provides various incentives, including transport subsidies, incentives for quality and certification, and the like	specific value chain ▪ Explore opportunities for a foreign strategic investor to play a key role in building the orange/mandarin value chain ▪ Explore possible financial incentives to attract strategic investors such as tax breaks or the availability of capital at concessional rates ▪ Build facilities for branding and packaging
Market		
▪ Ensure various markets (mandis) continue to operate as efficiently as possible ▪ Explore new markets possible under the Rajasthan Agricultural Produce Markets Committee (APMC) regulations (including private mandis, warehouse mandis, etc.) and support those that are additive to overall market transparency and help farmers receive better value for their products	▪ Mandis are designed to provide spot markets for farmers seeking to sell their produce, but they are prone to political considerations and may face disrepair ▪ The APMC mandis are currently also supporting commodities exchanges like NCDEX, where coriander is being traded ▪ The Rajasthan APMC framework provides for different market structures including private markets, and consumer farmer	▪ Create opportunities for new mandis; this development must be done carefully since it is disruptive to stop and start mandis; there is a regulatory test (for example, facilitating the licensing process) and quite critically, a viability test (the new mandi must have a sustainable business model and a management team committed to its success) ▪ Work with existing mandis to build better storage facilities and better links to farmers, including the Ramganj mandi in Kota and Bhawani mandis

▪ Use technology to improve efficiency ▪ Push markets to introduce new products where appropriate in line with international standards; for example, there could be a system of forward contracts or other risk mitigation instruments promoted by the mandis ▪ Make sure retail links are being established efficiently ▪ Enable new retail models to evolve, like consumer-farmer markets, supermarkets, and international retail chains, which have better range of products, storage facilities, prices, and other features that can benefit the consumer	markets, along with direct sale between farmers and buyers ▪ The central government recently introduced the concept of a National Agricultural Market (NAM); implementation envisioned by the Department of Agriculture and Cooperation through Small Farmers Agribusiness Consortium (SFAC) by creation of a common electronic platform deployable in selected regulated markets across the country	in Jhalawar ▪ Build new retail models with large players such as Reliance or foreign players such as Walmart; explore their interest in vertical integration to see whether they can enhance other parts of the value chain, and address existing gaps (such as online sales from retailers with multiple merchants)

Financing Structure

The ultimate question will be the type of investment initiative that is necessary. Experience shows that 'nothing succeeds like money' to attract interest and build momentum. There are many instances of domestic stakeholders becoming frustrated with development partners if initial discussions, research, and meetings are not followed by some willingness to invest or to create some initiative which provides additional services for the local agribusiness community. The exact nature and structure can evolve over time and after more detailed discussions, particularly with government.

In order for the World Bank to be involved in financing, the structure would need to fit within the guidelines of the World Bank's standard operating procedures and the Bank may also choose to explore the possibility of other partners in funding such an initiative. Some key decisions include:

Governance (who will administer the initiative)

Mandate (what is the initiative seeking to do and what are the key metrics)

Size (how great a commitment can be made)

Definition and timeline for success

Possible Investment Models

As mentioned above, agriculture is a vast and complex proposition. There is no silver bullet that has the capacity to transform agricultural development, and there is no single investment model that applies all across the value chain. Indeed, experience shows that even in the developed world, agriculture is financed by a mix of public and private finance. The challenge for countries such as India is to harness different pockets of capital in a way that will most likely meet the various needs and priorities in the sector.

Our analysis will show that the priorities for agricultural development in India can be summarized around some major themes:

Aggregation: The need for building robust models that address fragmentation and interact effectively with the value chain

Training: The need for capacity building and training in agronomy to farmers and other participants in the ecosystem

Infrastructure: The need to build robust storage, transport, processing, and communication infrastructure

Value Addition: The need to invest in processing and other value addition activities to enhance quality and productivity, and to enable India to fully realize the potential of its agricultural products

Technology and Innovation: The need to apply technological developments to production and processing, and develop innovative solutions to enhance the sector. India is a leading force in technology, which should be harnessed for the benefit of agriculture

Access to finance: The need to access different kinds of financial products through various sources ranging from banks to private equity.

Taking into account the various dimensions of the Indian agricultural sector and the need to meet its needs and priorities through different kinds of financing, the following are the possible options for investment models:

Early Stage Fund (Recommended Initial Size $20-25 million)	
Investment Proposition	▪ To provide capital for aggregators, FPOs, and production services to help them develop robust aggregation models ▪ Target existing FPOs; aggregators and NGOs active in Rajasthan, such as the Gram Unnati Foundation ▪ Make funds available as grants or patient capital ▪ Prioritize strong management teams and develop a business model that can become commercial
Source of Capital	▪ Concessional
Issues to Consider	▪ Management of fund ▪ Costs ▪ Criteria for investment selection ▪ Governance/ownership ▪ Size

Opportunities in Kota:

- Selected FPOs: There are about 11 FPOs in Kota and 11 in Jhalawar, promoted by different bodies including the National Bank for Agricultural and Rural Development (NABARD), the Small Farmers Agribusiness Consortium (SFAC) and the Department of Agriculture, Government of Rajasthan. Field visits have indicated that the environment for FPOs in Kota is favorable.

Training/TA Facility (Recommended Initial Size $5 million)	
Proposition	▪ A grant facility to be offered to investees of Early Stage Fund or on a standalone basis to provide training or technical assistance in rural areas ▪ Centers of Excellence could be an important target ▪ Encourage new models of training ▪ Access universities and agronomists ▪ Business skills
Source of Capital	▪ Concessional

Issues to Consider	▪ Management ▪ Size ▪ Criteria for allocating funds

Opportunities in Kota:

- Centers of Excellence: Specifically COEs active in Kota division and focused on citrus, and other horticultural products such as guava, and pomegranate.

Farm Services Company (Recommended Initial Size $5-7 million)	
Investment Proposition	▪ Create farm services company that offers services to aggregators; FPOs/farmer organizations/cooperatives in the region ▪ Create systems for crop and income traceability ▪ Objective is to allow farmers to become part of a platform that can more efficiently access finance and inputs
Source of Capital	▪ Concessional capital for start-up phase ▪ Move to concessional capital over time
Issues to Consider	▪ Ownership / management team ▪ Revenue model (balance between return and affordability) ▪ Governance ▪ Buy-in from aggregators and banks needed

Opportunities in Kota:

- Need to identify and finance a team and work with them to build an organization that can serve the Kota region to enhance the early phase of the value chain. Need to involve key financial stakeholders to ensure model will work.

Innovation Fund (Recommended Initial Size $5 million)	
Investment Proposition	▪ To invest in start-ups that develop technology and innovative ideas for the agri-business sector ▪ To benefit from India's technology industry

	▪ Ideas can be across the value chain
Source of Capital	▪ Concessional
Issues to Consider	▪ Start-up Oasis could be partner to the Innovation Fund ▪ Need to create specific window for agri-business

Opportunities in Kota:

➢ Startup Oasis in Jaipur is already working to incubate startups. Need to offer them capital and encourage the creation of an initiative targeted at agriculture.

Growth Capital Fund (Recommended Initial Size $20-25 million)	
Investment Proposition	▪ Small and medium enterprises (SMEs) and other businesses need growth capital to scale up ▪ Target across value chain ▪ Fund to longer term capital than is available from banks ▪ Business model should support commercial capital as debt ▪ Fund to exit to other commercial funders ▪ Example: AgDevCo from Africa
Source of Capital	▪ Concessional capital ▪ Can move towards 'returnable grants' model ▪ May also attract some commercial DFI investors
Issues to Consider	▪ Target market for investment ▪ Capital structure of Fund ▪ Management ▪ Pricing and return targets

Opportunities in Kota:

➢ Key constraints for this type of fund are the management team and getting access to funds. If those can be solved, such a vehicle can be transformative across the value chain. Its aim is not to fund start-ups but to provide growth capital to SMEs or companies that are already in existence. It is a route to building regional champions or attracting national companies to the Kota region. Examples for possible investments might include the Kota Mandi or the grading facility in Kota or funding for logistics providers such as Star Agri to expand into the region.

Public-Private Partnerships	
Investment Proposition	▪ Assess Public Private Partnership (PPP) model for specific infrastructure projects ▪ Suitable for warehouses, mandis, power
Source of Capital	▪ TBD
Issues to Consider	▪ Identifying specific targets ▪ Creating the investment proposition for each project ▪ Exploring funding opportunities

Opportunities in Kota:

- Mandis
- Infrastructure, including storage, processing and transportation
- Irrigation schemes

PPP models are always quite difficult to execute. They are usually targeted at infrastructure or hard assets. There could be a committee to identify such targets and then create a funding strategy.

Financial Services Enhancement Facility (Recommended Initial Size $10 million)	
Investment Proposition	▪ Capital investment to enhance capabilities of regional banks, Micro Finance Institutes (MFIs) and insurance companies ▪ Example: IFC has previously worked with Cooperative Bank of Andhra Pradesh, in India ▪ Promote new products, skills enhancement, and access to technology
Source of Capital	▪ Concessional ▪ DFIs

Issues to Consider	▪ Target clients ▪ Management ▪ Objectives

Opportunities in Kota:

- Possibility of targeting regional banks, e.g. Bank of Bikaner, or other financial institutions in the region; could also target insurance companies.

Strategic Intervention	
Investment Proposition	▪ Attract large corporate and private equity (PE) investors to build the agriculture value chain ▪ Example: Pepsi Co in Maharashtra; Coca-Cola in Maharashtra ▪ Need to compete with other regions
Source of Capital	▪ Private ▪ Multinational companies
Issues to Consider	▪ Create strategy for Foreign Direct Investment (FDI) ▪ Need to market region within India and possibly to foreign companies ▪ May need to hire consultants to help marketing process

Opportunities in Kota:

- Horticulture and Spices
- Need to explore which food companies may have an interest in making large strategic investment to the region and hence build a complete value chain. Rajasthan government will need to approach this systematically at the national level and create an environment to attract foreign capital.

II. INVESTMENT ALONG THE AGRICULTURAL VALUE CHAIN

Like all industries, agriculture has its own economic framework. This section describes how the industry develops over time and, more crucially, provides a set of analytical tools with which to assess specific challenges. It also offers a point of comparison as to why certain countries and sectors have prospered more rapidly in agricultural development. While regional differences play a role, basic frameworks can be applied to highlight key issues and challenges.

Agriculture is a complex sector, and a value chain approach provides a useful way to structure and simplify the overall analysis. Figure 2 breaks down the cycle of 'field to fork' into four distinct phases that together define the agribusiness industry.

Figure 2 - Agriculture Value Chain Key Issues

Primary Production

- Fragmented land holdings
- Poor access to seeds, technology, information
- Sub-scale farms lack access to finance, markets, open to different risks
- Need Aggregation at primary phase
- Different Models
  - Cooperatives
  - FPOs

Storage / Logistics

- Lack of warehouse storage
- Lack of warehousing facilities near farms
- Poor loading and stacking business; limited use of crates
- Poor rural roads; transportation damages produce
- Storage needed near production centres

Processing

- Grading; waxing packaging facilities need
- Facilities needed near farms
- Facilities needed to introduce quality control
- Need processing units for juicing; pulping; spice powders
- Processing must meet quality standards

Markets (Wholesale /Retail)

- Markets that connect farmers to value chain must be more efficient and transparent
- Need updated infrastructure
- Technology can offer upgrade
- Markets to connect processing to retail
- Larger supermarkets now offering more efficient routes

2.1 Production

The production phase is in many ways the building block of any agribusiness industry but it is also the most complex and challenging when seeking to devise policies or strategies to generate investment, growth, or development. Solving the challenge of 'primary agriculture' or the production phase remains one of the biggest and most controversial challenges in development. It goes to the heart of food security, economic growth, and poverty reduction. Even as the share of agriculture in overall GDP declines (which is observed in most economies as they industrialize), the share of the population employed in agriculture remains significant and declines much more slowly. In India, the share of GDP contributed by agriculture has declined to less than 15 per cent but the share of the workforce employed in the sector remains at around 50 per cent.

The production phase has a number of key stakeholders including farmers, small agribusinesses and landowners. The agribusinesses are varied and include those dedicated to arable land (which can include many different crops), livestock, and dairy, among other possibilities. Each of these has different challenges and hence requires different investment strategies.

However, several assertions can be made that define this part of the value chain. Most important of these is that, as with most industries, consolidation and the creation of scale is important to increase productivity. The need for aggregation is one the biggest challenges in Indian agriculture. Over the years, different models have been tried with varying degrees of success. For example cooperatives had been heavily used, but that system became corrupted by political interference and the creation of vested interests and has since been replaced with other structures that were designed to be more democratic and more market-focused.

In addition to the obvious benefits from economies of scale in terms of production, aggregation also improves access to inputs on more favorable terms, access to labour, and improved bargaining power with other parts of the value chain. However, the process of consolidation or aggregation is fraught with challenges. The most difficult is the prevailing system of land ownership and a related issue of the unwillingness of existing landowners to sell (or possibly lease) their landholding. This is highly controversial, since many in the development community and certainly in the NGO community believe that agricultural progress needs to preserve the current system of rural communities and smallholder farming. In the developed world, this process of moving people away from the rural economy happened over a long period of time, and there was natural pull from the opportunities provided by industrialization and urbanization. In India, that process remains a challenge.

The situation is made more complex by prevailing land ownership and the legal process entailed in transferring such ownership. Land title is done through a largely informal process, which may often be outside the legal framework. Interventions to improve land tenure and ensure clear title can have a significant impact on opportunities throughout the agricultural sector, yet these can be very challenging areas of the enabling environment to address.

Suffice it to say if consolidation is unlikely to take place easily through individual farms getting bigger, then other models of aggregation need to be explored. These have shown differing degrees of success. These models can be encouraged by regulation and policy impetus or they can be left to evolve naturally. To the extent that such models offer robust and sustainable aggregation platforms, their business models must be explored to analyze the extent to which additional finance or investment could be useful. As mentioned, in some countries aggregation models have actually caused productivity to fall. Evidence from such cases shows that finance alone may not be sufficient to create robust models. They also need strong management, a robust underlying business model with a comprehensive understanding of the natural and commercial risks in the business, and, where possible, proper risk mitigation strategies. Above all, these aggregation models need strong links to markets and hence the rest of the agriculture value chain.

2.2 Storage/Logistics

For any rural agriculture ecosystem to succeed there needs to be an effective network of storage facilities. Ideally, such facilities must be available near the sources of production particularly for perishable crops such as fruits and vegetables, but it is also important to have larger facilities at regional hubs. Different types of storage are needed depending on the type of crop and the length of time that storage may be needed.

Gaps in storage and logistics infrastructure can lead to a number of systemic inefficiencies including the following:

i) *Limited Geographic Coverage of Storage Facilities*: Farmers in certain areas face extra transportation costs or the possibility of excessive wastage of perishable produce. In India, much of the current capacity is based around mandis, which serve specific regional markets.

ii) *Inadequate Storage Infrastructure*: This is a national problem. The Planning Commission of India has estimated that there is a deficit of approximately 35 million MT. This problem is exacerbated by the fact there are regional disparities. As of March 2014, Uttar Pradesh had the highest number of cold storage facilities in the country (with 2176 facilities); however, Rajasthan is lagging behind (with 154 facilities).

iii) *Role of Intermediaries:* Too many intermediaries in the form of traders and commission agents are involved between the farmer and the storage facilities. This creates long marketing channels and adds additional cost to the farmers.

iv) *Lack of Cold Storage Infrastructure*: Due to the perishable nature of horticultural products, which have a lifespan ranging from just a few days to a few weeks even when temperature controlled, cold chain is a crucial element in the value chain. Despite a growth trend in cold storage in India, supply of cold storage does not match demand. This creates huge waste in the system. Not only is extra cold storage needed, but facilities are needed nearer the farms, and the road infrastructure between the farms and the facilities needs to be of adequate quality to ensure that produce is not damaged during transportation. While the rural roads infrastructure has improved substantially in recent years, there is room for further development.

v) *Lack of High Quality Warehousing Systems:* These are needed to provide uniformity in quality control and to give confidence to market participants that stored produce retains its quality, information is available in a transparent manner, and title is robust. These systems are needed to give financial markets the confidence that financing products such as warehouse receipts can operate efficiently to provide much needed liquidity to the system.

Given the size and importance of agriculture in the Indian economy and the gaps that exist in storage and logistics, various private sector players have entered the market to fill these gaps. A variety of models are emerging in Rajasthan and Kota division. There are some, like Star Agriwarehousing and Collateral Management Limited (Star Agri), that are providing comprehensive post harvest management solutions. Apart from the warehousing services Star Agri provides, it also offers services in insurance, collateral management and bulk procurement. These are value added services, and companies such as Star Agri are able to focus on the most lucrative markets. Hence they are able to attract finance from commercial sources; for example, Star Agri has attracted private equity investment from IDFC among others.

Other players in this part of the value chain include companies such as Sohan Lal Commodity Management (which has raised money from Nexus and Mayfield) and Cold Star Logistics, which is promoted by Tuscan Ventures.

This is a crucial advantage for companies outside the production phase or in the 'post harvest phase,' i.e. those that have the possibility to attract commercial capital from a range of different sources. Provided they have a strong business model and good quality management, these companies can attract private equity funding and they can attract bank financing for working capital needs.

The challenge for the Rajasthan Government or indeed for the Central Government seeking to promote activity in certain regions is to find mechanisms that can attract strong companies that operate in the storage phase of the value chain. The encouraging factor is that they do seem to respond to incentives, and hence administrators have the capacity to use financial tools such as capital subsidies to influence behavior where necessary.

2.3 Processing

Food processing is a priority area for Indian economic policy. Given the huge agriculture production in India, there is substantial potential for this sector. This potential will be further fuelled by India's growing middle class, which will create a market for a variety of different food products. Many of these will be processed foodstuffs.

Indeed, as stated by Singh, Tegegne and Ekenem (2012) and others, the agro food processing industry is one of the largest in India, employing around 18 per cent of the workforce and ranking fifth in terms of production, consumption, exports, and expected growth.

The high potential for the sector is underpinned by the high value added activities that drive it. These create new products that carry much better margins and offer additional opportunities for employment and development. The higher returns are the objective of any developing country seeking to move away from an economy with a mainly agrarian employment structure.

Indian States including Rajasthan undoubtedly have the potential to build an even greater food processing sector, but as with all aspects of industrial policy, it is helpful to understand the dynamics for success. A simple SWOT analysis (presented by Singh and co., among others) is useful to highlight the main points (see Table 2).

Table 2: Indian Food Processing SWOT Analysis

Strengths: ▪ Abundant availability of raw produce ▪ Priority status given for agro-processing by the Central Government (and hence regional governments will also support this) ▪ Vast domestic market ▪ Network of manufacturing facilities throughout the country	**Weaknesses:** ▪ Poor infrastructure (storage, cooling facilities, transportation) ▪ Lack of adequate quality control and testing facilities in line with international standards ▪ Too many intermediaries in the supply chains, leading to poor market signals and expensive marketing chains ▪ High requirement of working capital (need funding) ▪ Seasonality of raw produce (could be overcome by better warehousing) ▪ Poor linkages between innovation/R&D labs and industry
Opportunities: ▪ Large production base that presents huge opportunity by global standards; challenge is to create efficient industry around the opportunity ▪ Rising incomes and changing consumption patterns that create natural demand ▪ Incentives around food parks (Rajasthan's food parks present untapped potential) ▪ Favorable demographic (younger population will be drawn to processed foods) ▪ Availability of technology ▪ Opportunities in global markets; Middle	**Threats:** ▪ Affordability of processed food ▪ Current tastes still favor fresh foods ▪ Costs of carrying inventory are higher ▪ Packaging and branding still below market standards ▪ Domestic players remain fragmented

East and Asia are natural markets for Indian products if they can meet quality standards ▪ Finance available from international investors both strategic and private equity player. An example is the recent juicing facility set up in Maharashtra with funding from Pepsi Co and Black River (the PE arm of Cargill).	

To add granularity to the analysis, it is useful to describe or define the agro-processing industry. The Ministry of Food Processing has created the following segments within the food processing industry set out in the Table 3 below:

Table 3: Segmentation of Different Sectors in Food Processing Industry

Sectors	Products
Dairy	Milk Powder, Skimmed milk powder, condensed milk, Ice cream, Butter, Cheese
Fruits and Vegetables	Beverages, Juices, Concentrates, Pulps, Tinned fruits, Potato chips
Grains and Cereals	Flour, Bakeries, Corn flakes, Beer, Grain based alcohol
Fisheries	Frozen and canned products
Meat and Poultry	Frozen and canned products, Egg powder
Consumer Foods	Snack foods, Nankeens, Biscuits

Each segment would benefit from more activity in the organized (or formal) sector. For example, currently only about 15 per cent of the dairy sector operates in the organized sector. As this increases, it will allow more activity to take place in the processed food sector related to dairy products.

However, exploiting this potential requires concerted action from a number of stakeholders. The government is also important for creating a conducive enabling environment in support of processing. In that respect, the government has undertaken a number of important measures, as discussed in greater detail in the Regulatory Report. One of these is the Food Safety and Standard Act (FSSA) of 2006. This was an effort to consolidate the laws relating to food and establish the Food Safety and Standards Authority of India to establish sciencebased standards for foodstuffs and to regulate their manufacture, storage, distribution, sale and import.

The salient features of the Act are:

- Movement from multi-level and multi-department control to a single line of command
- FSSAI as a single reference point for all matters relating to Food Safety and Standards, Regulations and Enforcement
- Decentralization of licensing for manufacture of food products
- Investor-friendly regulatory mechanism with emphasis on self regulation and capacity building
- Emphasis on gradual shift from regulatory regime to self compliance
- Consistency between domestic and international food policy measures without reducing safeguards to public health and consumer protection
- Adequate representation of government, industry organizations, consumers, farmers, technical experts, retailers etc.
- Enforcement of the legislation by the State Governments/ UTs through the state Commissioner for Food Safety, his officers and Panchayat Raj/Local municipal bodies

In addition, the government has paved the way for foreign investors to make sizeable investments into individual companies or projects. Investors may be further encouraged with tax breaks which could come from regional or central governments.

To help build the supporting infrastructure, the Government of India has made funds available for Food Parks and also for packaging and warehouse facilities. As of 2015, RS 423 million had been made available to implement the Food Parks Scheme, which had approved assistance for over 50 parks across the country. At present, there are four Agro Food Parks in Rajasthan, located at Kota, Jodhpur, Sri Ganganagar and Alwar. These parks have been developed by the Rajasthan State Industrial Development and Investment Corporation (RIICO). Additionally, Under the Mega Food Parks Scheme, the Ministry of Food Processing Industries (MoFPI) developed flagship programs such as Greentech Mega Food Park Pvt. Ltd. (project SPV) in Roopangarh, Rajasthan. The track record of such parks has been mixed, which highlights the limitation of top-down policies that do not take sufficient account of the underlying economic realities.

As was highlighted in the SWOT analysis for processing, in contrast with other parts of the value chain in particular the production phase, the stakeholders in the processing phase are able to access different sources of finance. Banks are ready to offer finance for investment and, where appropriate, for working capital. There is also interest from large institutional investors in particular private equity funds in specific projects. Large institutional players such as Temasek and Black River have made significant investments. In addition, large international companies also find this sector attractive and are looking for opportunities to make direct investments, create joint ventures, or even make acquisitions. As mentioned above, the Government of India has been very encouraging of Foreign Direct Investment in this sector. The Union Budget of 2016-17 announced the opening of the storage, food processing, and retail sectors to foreign investment.

2.4 Markets

It is vital that any commercial value chain is linked to markets and hence to customers. As is the case with other sector as well, in agriculture the value chain touches markets at different points.

There is the link from the farmers to wholesalers or aggregators or to the processing sector. A major portion of the activity takes place at local regulated markets (i.e. mandis) that have been established over a long period of time. Many such mandis are the hands of local governments. As such they have a business model that is largely regulated by the government, and they depend on government funding for investment and modernization. These mandis are an important part of the backbone of Indian agriculture but many of them need funds to build more modern storage facilities and to make use of technology in updating their systems and means of communication with the farmers. They also need better governance models and more transparency in their interaction with farmers. One of the biggest sources of friction cited in the current system is the inability of farmers to deal with the main players in the mandis (i.e., the commission agents) on an equal footing.

To date, this sector is dominated by government owned entities. There have been issues not only with the quality of their services but also with the fact that many of these are not easily accessible to the rural areas. Clearly, road networks have improved which has made a significant difference, but more can be done.

There has been a recent move to enable ad hoc markets or private mandis, but so far this has had a mixed success. This is partly because the process for creating such markets is not efficient (See Regulatory Report), but it is also likely that there is not enough understanding of the business model for a successful mandi. This is a complex business that has historically relied on government support.

The other area in which markets play an important role is the interface with the consumer, i,e. the retail markets. In India this has historically been dominated by SMEs and often very small businesses. They face all of the difficulties associated with SMEs such as asymmetric information sharing, difficulties in accessing finance, and insufficient resources to invest in modern technology, all of which make it difficult for them to compete with bigger players. Another controversial episode in the development of the Indian agribusiness has been the emergence of larger retail outlets. At the top end there has been interest from international players such as Walmart and Tesco and also from domestic players such as Reliance.

These bigger players can offer larger retail outlets. They offer state of the art refrigeration and storage technology, which enables them to offer better quality produce to the consumer and often at better prices. Clearly, the bigger outlets favor the consumer over the long run. Currently, they predominantly service mainly the urban market, which is growing quickly and which embraces their service quite readily.

In terms of access to finance, there are some parallels with the production phase in that there is a preponderance of small businesses many of which struggle to access finance. They can only access finance to the extent they have proper cash flows and account which enable the banks to make realistic credit decisions.

This is not an issue for the bigger retail players who have no problems raising finance. Indeed, they may even become providers of finance both to the wholesalers/processors that supply them with goods and even possibly to consumers through some form of credit card.

2.5 Government Support

In India, as in many other countries, agriculture is heavily supported by the government. The farming sector is often a powerful lobby, and an array of subsidies are used to support agriculture. These vary from price support subsidies to credit enhancement of different types. Table 4 shows the extent of government support in an illustrative group of countries. Interestingly, the heaviest levels of subsidy per hectare are in the United States and European Union.

Table 4: Comparison of Subsidies to the Agriculture Sector (2012 data)

Country/Region	Subsidy per hectare	Population dependent on agriculture
EEC	\$82	8%
USA	\$32	5%
Japan	\$35	4%
China	\$30	24%
South Africa	\$24	18%
India	\$14	60%

India, which has made significant economic progress in the last couple of decades, faces much greater pressure on the government budget. Hence, agriculture must compete with several other sectors for government funds. That said, given that over 50 percent of the population still depends upon agriculture for its livelihood, it is unrealistic to assume that either the Central Government or the State Governments can take a laissez faire approach to agriculture.

As a major stakeholder, the government acts in the sector in a number of different ways. Firstly, it acts directly through subsidies or other forms of direct economic or financial incentives. This is quite controversial in today's world, and the Indian government needs to adhere to various international trade disciplines. Secondly, it can act through incentives or directives to certain sectors, for example the financial sector to extend more resources to the agro business sector. Thirdly, it passes laws or regulations relating to the agricultural sector, such as those regarding land tenure, and other aspects of legal rights along the value chain. Fourth, it regulates who can provide different types of goods and services and where these goods and services can be bought and sold. Lastly, it also regulates safety and quality controls over the production of foodstuffs and how they are sold to the public (See Regulatory Report). The intent here is not discuss the regulatory framework in detail, as this is covered in the Regulatory Report, but simply to highlight the role of government in agriculture, which can sometimes be seen as contentious and may lead to the creation of vested interests.

All of this shows that the government is a significant stakeholder in the agriculture sector, and it has substantial power to direct resources and to introduce efficiencies where possible. The intent here is not to evaluate various government policies but to acknowledge that they play an important role in meaningful financing initiatives, which need to take into account the functions of the government.

In India, there is a raft of regulations that impacts all aspects of the agriculture value chain. These start from the laws regarding land holdings, which have had a direct impact on the industry and do play a direct role in the highly fragmented primary production sector. As discussed, one of the great challenges is to find models that allow for some consolidation such that the efficiencies in productivity can be realized. Laws and regulations continue along the value chain, impacting other facets such as the existence of markets where farmers may sell or exchange their goods. This includes the regulations around the mandis governed by the Agricultural Produce Market Committee (APMC) Act.

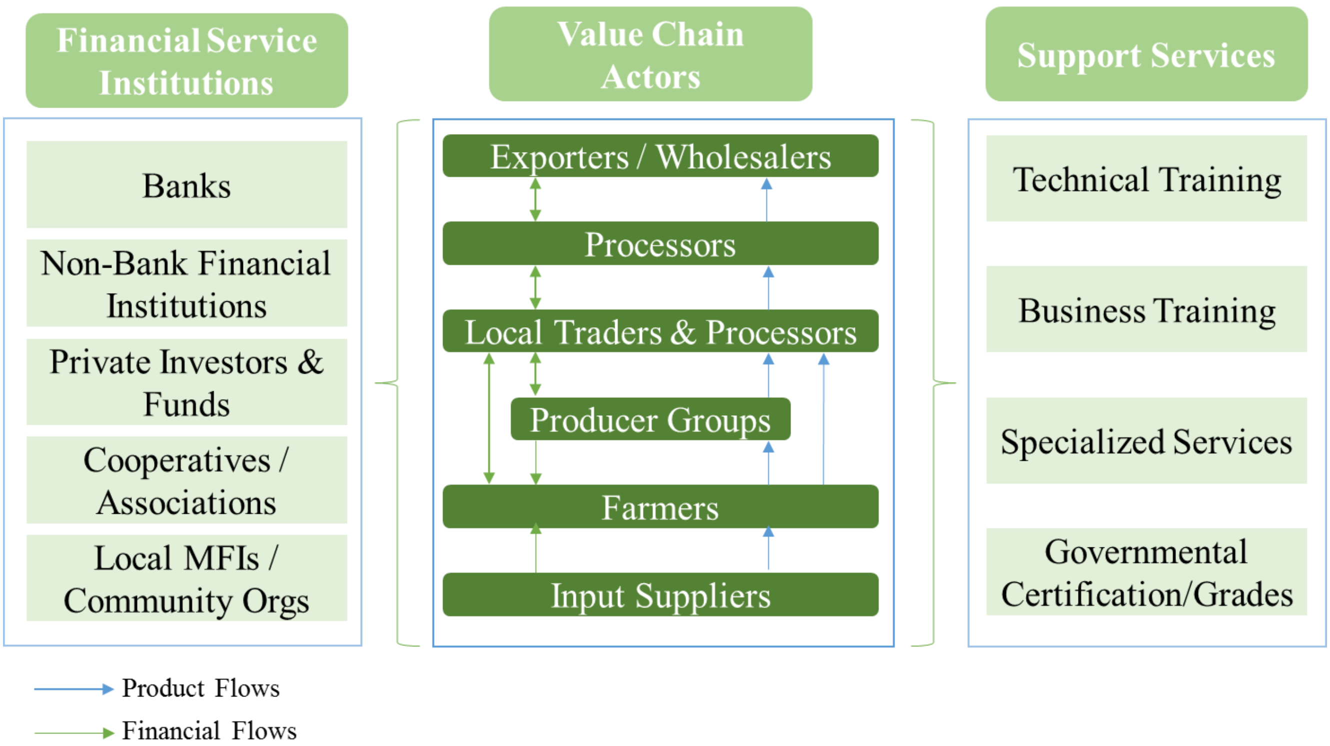
In addition to the regulatory framework, there is a directive from the RBI that banks need to lend a certain portion of their overall loan book to the agribusiness sector (Priority Sector Lending). Such directives are often made with the best intentions, but there is the possibility of unforeseen consequences. For example, such actions could lead to not enough credit worthy borrowers.

III. FINANCE FOR AGRICULTURE

The availability of finance is a crucial factor in sustaining a viable and vibrant agribusiness sector. However, the agriculture value chain interacts with a variety of different players in the financial markets. This interaction is diverse and varies considerably in quality. It is helpful to look at this in some detail in order to assess whether access to finance is in some ways holding back agricultural development and, if so, then what might be done to improve the situation.

The following figures represent the interaction of the agriculture value chain by type of institution (Figure 3). In reality, these interactions are quite complex, but for the sake of analysis these schematics draw out a number of important points which might be useful to better understand the operations and incentives of key stakeholders and how those might be harnessed in designing specific financing or investment initiatives. Even these diagrams are to some degree a simplification, and, where additional points are helpful, those will be set out. For example, the role of international entities and NGOs is important, as is the role of government and its agencies.

Figure 3 - Financial Relations and Linkages from Inside and Outside the Value Chain



As mentioned, in the agribusiness ecosystem, the production phase of the value chain is vital, as it creates the platform for the overall market. This also includes the farmers and the producers of the agricultural products. This relationship between farmers and the financial sector is seen to be controversial in many countries, and India is no different. It is worth looking at this in more detail, however, in order to consider the best way for farmers to interact with the financial sector on a more equal footing.

Another point worth making at this stage is that agriculture as an industry cannot withstand very high costs of finance. This means that there is often reliance on or an appetite for concessional capital, and this is only available for certain sources such as the domestic government or foreign development agencies/NGOs.

3.1 Informal Financial Sector

As already discussed, one of the features of the Indian agriculture sector is the hugely fragmented production sector. For various reasons, individual land holdings are often small and economically sub-scale. Amongst other things, this creates businesses that are often not sufficiently credit worthy to access bank finance. They do not have financial records of sufficient quality to enable credit judgments to be made, and their businesses are often simply too small to be acceptable to banks even to regional banks.

For many, this is a key market failure, yet it could equally mean that banks are simply making a rational decision on how to allocate their scarce resources. This pushes the small farmers into the world of local moneylenders and in some cases micro finance institutions. These individuals and entities are often able and willing to make the quick credit decisions that the farmers might need, but they will charge very high rates of interest, which imposes a heavy burden on the smallholder farmer. In addition, they can impose punitive security arrangements, which can cause additional distress if the farmer is unable to meet timely repayment terms.

Short-term working capital finance would help farmers to make better decisions on when they sell their product in order to get the best price. But the problem is not necessarily the banks but may instead be the business profile of the farmer. The solution, therefore, might lie in finding more resilient business models in which the farmer can take part. Creating such aggregation models remains one of the challenges for Indian agriculture.

3.2 Banks (and Cooperatives)

Commercial banks are required to lend a certain percentage of their loans to the agribusiness sector. Most of the banks have agri-finance groups, and the banks have a strong interest in developing their business with the sector. However, frustration remains at the level of interaction between the banks and the smallholder farmers. Most of them feel that banks have no interest in them.

This deadlock needs to be broken if Indian agriculture is to have steady and reliable access to credit. As the Indian economy grows and becomes more institutional, the biggest flows of credit will go via the banks. The key question is how to make the farmers more ‘bankable.’

This moves the debate back towards the benefits of aggregation and enabling banks to deal with the aggregator groups rather than individual farmers. Evidence shows that often farmers need further technical assistance and training to enable them to present proper financials and have the capacity to deal with the processes of any particular financial institution. FPOs or other aggregation models can provide the necessary assistance to the member farmers. Banks are unfairly criticized for having bureaucratic processes that are difficult for untrained, rural farmers to deal with. But in reality, banks have a duty of care that requires them to follow certain procedures in selecting clients and extending credit. Conversations with banks (in particular HDFC Bank and RBL Bank) demonstrate that they ready and willing to work with aggregator groups to provide assistance where necessary to enable them to deal more effectively with banks.

The banking system in India includes a wide variety of financial institutions starting with large national banks and then moving to regional banks or even cooperatives that have undertaken banking activities (cooperatives might have established a banking and financing capability). In many instances, banks, in particular some of the regional cooperative banks receive financial assistance from donors, government agencies, or international NGOs to help strengthen their agriculture activities. For example, in Andhra Pradesh, IFC is working with the Andhra Pradesh State Cooperative Bank to broaden the range of products that can be offered for small farmers. These include both savings and lending products but the overall mission is to reach more rural households and to make them comfortable with dealing with the institutional financial sector.

Yet there are challenges with initiatives of this type. The NGO or development agency must decide how to deploy its financial resources. In truth, the most effective measures are probably those that enhance business skills or create more robust business models, but there may be a tendency of the NGOs to insist that funds are made available at ‘affordable rates.’ If this means uneconomic rates, then such a strategy can only be sustained or scaled to the extent the intermediaries are able to access concessional or preferential funding to support their lending activities.

There is always a danger that if financial institutions are encouraged or even directed to lend to a particular sector and have to do so at ‘below market clearing rates;’ this has the capacity to create financial bubbles and will create instability in the medium to long term. Sustainable lending models tend to have pricing which reflects the underlying risk/reward of a business, and for a bank the activity must also be attractive relative to other businesses where it can deploy its capital.

There are models that use concessional funds to enable local financial institutions to expand their lending activities in a sustainable manner. For example, grants or concessional capital could be offered as equity or long term subordinated capital, which allows the local financial institution to expand its lending capacity. But this creates no guarantees on the price at which loans are made to end-users. To reiterate this important point, sustainable models are those that do not distort local markets.

Banks play an important role, not only in direct lending but also as intermediaries for other products such as warehouse receipts, forfaiting, and in some cases even leasing and equipment finance. These products are seen to have an important role in financing agriculture markets and will be discussed in more detail below. In addition to their role with the farmers, banks provide finance for market participants further downstream in the agriculture value chain. This can be for short-term working capital as well as for larger items of capital expenditure. Experience shows that further downstream there is a greater possibility of finding robust business models that can attract and finance bank loans. With logistics companies or storage companies there is the likelihood that potential investments will be made from larger companies with balance sheets that can support any incremental debt and which will only borrow against a realistic investment plan.

There are often views expressed on whether banks should be 'pushed' into lending more into the agriculture sector. There are arguments that there should either be caps on the rates of interest or directives for banks to lend more into the sector, as is currently the case under the RBI guidelines for priority sectors. But such initiatives need careful thought and design to ensure they don't cause stress in the banking sector or financial bubbles in the market. One must bear in mind that in 2008-09 India enacted the Agricultural Debt Waiver and Debt Relief Scheme (ADWDRS) where a total of $16-17 billion of debt of rural households was written by the banks. There was a recapitalization of the banks by the government such that the banks showed no losses as a result. The purpose of this was to remove the 'debt overhang' from the sector and to hopefully kick start bank appetite for agriculture lending especially to the higher risk areas. According to Xavier Gine of the World Bank, the reality has been that banks have used this to clean up their balance sheets but have focused on the safer areas for further lending. There have been criticisms of the government action in that it created moral hazard and signaled to the markets its intent to interfere in the market.

In the markets for products such as warehouse receipts, banks are again simply making what they consider to be rational, commercial decisions. What determines success in those markets will be the robustness of the market itself and whether the market participants have faith in their ability to transact in a commercial and transparent fashion.

3.3 Private Equity Funds, Venture Capital Funds

Over the last twenty years, many institutional investors have invested in certain asset classes by using the intermediary of a fund manager. The most common of these are private equity funds or venture capital funds.

Private equity funds have become active in Indian agriculture. For example Black River, a fund created by the U.S. food giant Cargill, has recently invested in a juicing facility in Maharashtra alongside PepsiCo. Another example is the Rabo Private Equity Fund, which has around $150 million to invest and is funded by many of the leading DFIs in the world including IFC, CDC, Proparco and KfW. These investors are looking for financial returns, but the remit of the fund manager is to invest in agribusinesses across the value chain.

In general, private equity investors look for existing businesses with cash flows or with a balance sheet that may be able to use additional equity but which can also support debt in order to create leverage for the equity investors. They will look for strong management and a solid business plan, and many will look to see how they can eventually exit or monetize their investment. This can be through a sale or in some cases a listing.

To illustrate, there have been a number of success stories involving private equity funds investing in the dairy industry in India. For example, Carlyle invested $22 million into Tirumala for a 26 per cent stake giving the business a valuation of approximately $90 million. In 2014 the business was sold to the French food group Lactalis for $275 million, enabling Carlyle to treble its money in 4 years.

Given the nature of the investments targeted by private equity funds, it is likely that they will invest in processing, logistics, or possibly storage. They look for proven business models, which have the capacity to be scaled up and eventually have a profile that would appeal to strategic industrial investors.

In India, the agribusiness industry is also attracting funds that employ a more venture capital type approach rather than a traditional private equity style of investing. These funds work with entrepreneurs that provide new technologies or new business models for the agribusiness industry. A good example is Omnivore, which has funding from institutional investors and other commercial investors. They have made a number of investments in highly innovative companies, for example Ecozen, which is a company building solar powered cold storage solutions and other similarly innovative companies. The challenge for funds such as Omnivore is how they can find investments that naturally fit into the overall value chain and more particularly if they can find investments that can benefit the small farmers or, in some way, the production stage of the value chain.

Another fund with a venture approach is Ankur Capital. They have a more overtly social mission in that they are seeking to incubate businesses that impact rural livelihoods. They do not have a specific focus on agriculture but have invested in a company called Cropin, which uses technology for various aspects of farm management.

There could be huge potential in seeking innovations for agriculture given India's pool of skilled resources. This may something to tap into the overall investment initiative.

3.4 Development Finance Institutions/NGOs

India has long since been a substantial recipient of aid from the international DFIs and from other countries. Its sheer size and the size of the issues surrounding poverty are so large that India remains a large target for DFIs, donors and NGOs.

However, given the progress that India has made in the last 20 years and given its ascent in the global league table for absolute GDP, there are some countries that are now becoming a little more wary of India. For example, the Department for International Development (DFID) of the UK has pulled back its activities quite sharply and may do so further.

The DFIs remain are a large pool of investor capital with a strong interest in promoting development. As a group, the DFIs are interested in agriculture but somewhat incongruously they tend to shy away from green-field or upstream agriculture projects and have a strong preference for downstream projects in particular logistics and processing.

The DFIs also participate in private equity funds. There are two notable examples. In India, the Rabo Private Equity Fund is funded by DFIs. It is targeted at agriculture in India, and its portfolio is heavily skewed towards companies at the downstream end of the value chain. Another example is the African Agriculture Fund established in 2011 after some vocal support from the political leaders of the G8. That fund has struggled to find suitable transaction, and its portfolio currently consists of a packaging company and an engineering company making agricultural machinery, with very little at the upstream end of the value chain.

Overall, the DFIs have the capacity to invest large sums of money either directly or via a fund. To the extent that large infrastructure or storage projects could be found, one or more DFIs could be potential co-investors, via the structure of private equity funds.

3.5 Impact Investors

Over the last 10-15 years there has been a huge leap in investors seeking to make a social impact as well as generating a financial return. There is a huge discussion around the nature of these investors and their exact criteria for selecting potential investments. It is difficult to generalize on their financial objectives since they are a diverse group.

However, there is strong interest amongst this group to support rural livelihoods, and hence there is strong interest in agriculture. There is also a strong interest in supporting smallholder farmers, and these investors are willing to look at upstream investments. The challenge is often to involve these investor in a structure which has commercial objectives rather than purely social objectives. If that can be done, impact investors can often be an invaluable source of patient capital, which can fund investments outright or might be used as the subordinated portion of a financing structure in a fund or corporate structure.

Examples of impact investors that have been active in India agriculture include the Acumen Fund, which has invested into a dairy business and a business providing renewable energy for rural households. Others include the Grassroots Business Fund and the Rabobank Foundation.

The Financing Value Chain

To round out the picture on agriculture finance, it is important to look at how the funds flow between the different stakeholders in the upstream phase of the value chain and what that means for their financing needs and opportunities. Figure 4 shows clearly that different products and different types of lenders are active at different stages of the value chain.

There is a great deal of debate around so-called market failures in agriculture finance. Various assertions are made such as:

- Banks don't understand agriculture and so fail to lend to small farmers
- Risk mitigation products or credit enhancement products can help farmers access bank lending
- Banks ask for excessive security arrangement

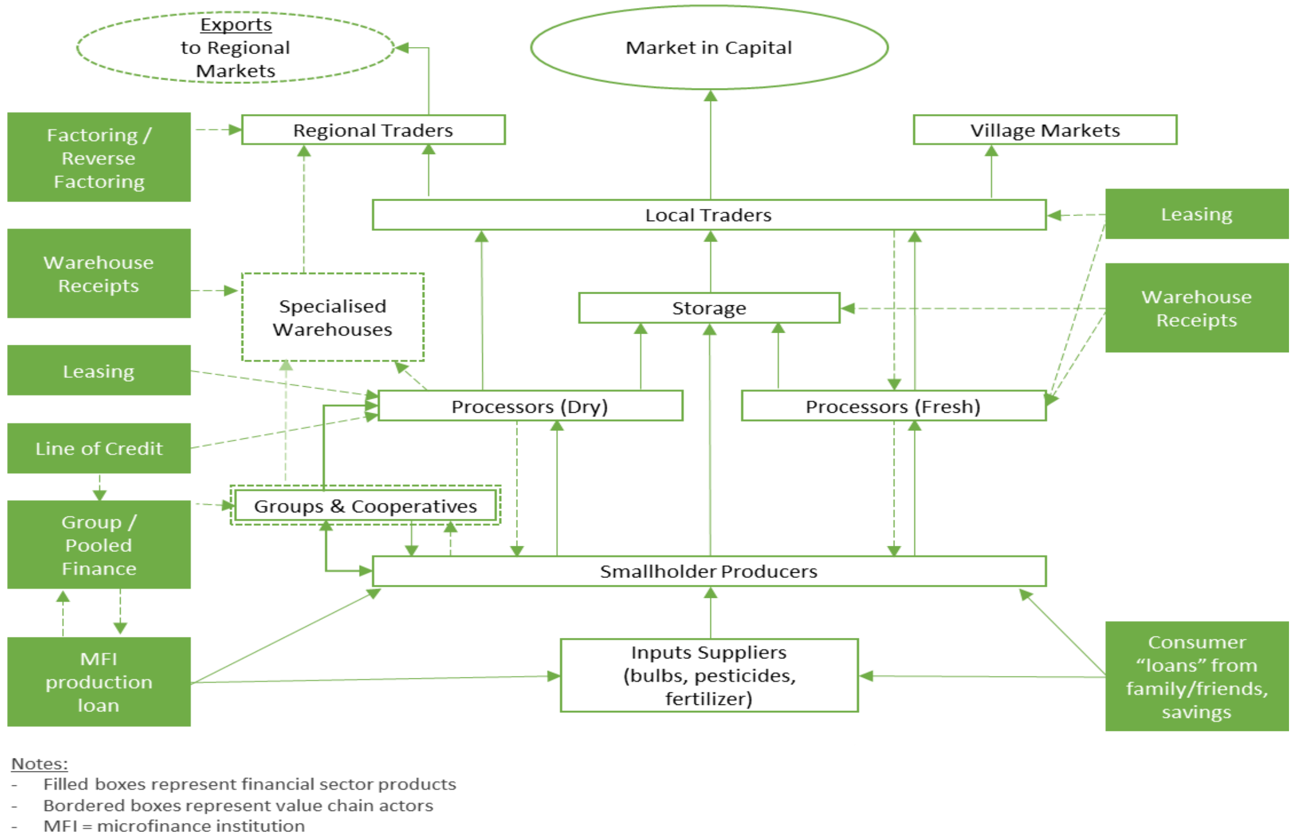
There may be some truth in these, but they miss the bigger point, which is that banks are institutional lenders that have to operate to certain credit standards. If small farmers are unable to meet those standards through lack of scale or because they cannot provide robust financial statements of the cash flows from their business, then it is difficult to expect banks to lend.

It is also important to understand that banks have a finite capacity to lend, and it is entirely rational for them to choose the higher quality clients for their loans. Credit enhancement or other risk mitigants can help if they are of sufficient quality or are sufficiently robust such that the borrower is able to meet the standards of the bank.

In India, currently there is an RBI requirement to allocate a certain amount of lending to agriculture but such directives need to be careful not to push the banks into uneconomic lending. That in itself can be the cause credit bubbles or it can have the unintended consequence of weakening the balance sheet of certain banks. This is particularly a risk for smaller regional banks.

As has already been mentioned, the smallholder farmers rely mainly on the informal sector of moneylenders and in some cases microfinance institutions. They pay high rates of interest primarily as a result of their need to borrow at short notice and because they don't have the necessary systems to capture their financial records. Hence the banks and other parts of the formal sector find it challenging to lend to them.

Figure 4 - Flow of Funds Across Value Chain



The above figure also highlights that as the value chain moves away from the small farmers, the finance moves towards a larger array of products including lines of credit, equipment leasing, and warehouse receipts. A full list of value chain financing products is detailed in Table 5 below. The ability to access these products is often a function of how well a business is managed.

Table 5: Typical Financing Instruments used in Agriculture Value Chain Financing

Instruments	Brief Description
Product Financing	
Trader Credit	Traders advance funds against the expected outputs to producers to be repaid in kind, at harvest time. This allows traders to procure products and provides a farmer with needed cash (for farm or livelihood usage) as well as a guaranteed sale of outputs. Less commonly, trader finance is also used "upward" in the chain whereby the trader delivers products to buyers on credit.
Input Supplier Credit	An input supplier advances agricultural inputs to farmers (or others in the VC) for repayment at harvest or other agreed time. The cost

	of credit (interest) is generally embedded into the price. Input supplier credit enables farmers to access needed inputs, which enables increase in sales of suppliers.
Marketing Company Credit	A marketing company, processor or other company provides credit in cash or in kind to farmers, local traders, or other value chain enterprises. Repayment is most often in kind. Upstream buyers are able to procure outputs and lock in purchase prices and in exchange farmers and others in the value chain receive access to credit and supplies and secure a market for selling their products.
Lead Firm Financing	A lead firm either provides direct finance to value chain enterprises including farmers, or guaranteed sales agreements enabling access to finance from third party institutions. Lead firm financing, often in the form of contract farming with a buy-back clause, provides farmers with finance, technical assistance and market access, and ensures quality and timely products to the lead firm.
Receivable Financing	
Trade Receivable Financing (including bill discounting and letter of credit)	A bank or other financier advances working capital to agribusiness (supplier, processor, marketing and export) companies against accounts receivable or confirmed orders to producers. Receivables financing takes into account the strength of the buyer's purchase and repayment history.
Factoring	Factoring is a financial transaction whereby a business sells its accounts receivable or contracts of sales of goods at a discount to a specialized agency, called a factor, who pays the business minus a factor discount and collects the receivables when due. Factoring speeds working capital turnover, credit risk protection, accounts receivable bookkeeping, and bill collection services. It is useful for advancing financing for inputs or sales of processed and raw outputs that are sold to reliable buyers.
Forfaiting	A specialized forfaitor agency purchases an exporter's receivables of freely negotiable instruments (such as unconditionally-guaranteed letters of credit and 'to order' bills of exchange) at a discount, improving exporter cash flow, and takes on all the risks involved with the receivables.
Physical Asset Collateralization	
Warehouse Receipts	Receipts from certified warehouses can be used as collateral to access a loan from third party financial institutions against the

	security of goods in an independently controlled warehouse. Such systems ensure quality of inventory, and enable sellers to retain outputs and time the sale for a higher price.
Repurchase Agreements (Repos):	A buyer receives securities as collateral and agrees to repurchase those at a later date. Commodities are stored with accredited collateral managers who issue receipts with agreed conditions for repurchase. Repurchase agreements provide a buy-back obligation on sales, and are therefore employed by trading firms to obtain access to more and cheaper funding due to that security.
Financial Lease (Lease- Purchase)	A purchase on credit, which is designed as a lease with an agreement of sale and ownership transfer once full payment is made (usually in installments with interest). The financier maintains ownership of said goods until full payment is made making it easy to recover goods if payment is not made while allowing agribusinesses and farmers to use and purchase machinery, vehicles, and other large ticket items without requiring the collateral otherwise needed for such a purchase.
Financial Enhancements	
Securitization Instruments	Cash flow producing financial assets are pooled and repacked into securities that are sold to investors. This provides financing that might not be available to smaller or shorter-term assets and includes instruments such as collateralized debt obligations, while reducing the cost of financing on medium and longer-term assets.
Loan Guarantees	Agricultural loan guarantees are offered by third parties (private or public) to enhance the attractiveness of finance by reducing lending risks. Guarantees are normally used in conjunction with other financial instruments, and can be offered by private or public sources to support increased lending to the agricultural sector.
Joint Venture Finance	Joint venture finance is a form of shared owner equity finance between private and/or public partners or shareholders. Joint venture finance creates opportunities for shared ownership, returns, and risks, often with complementary partner technical, natural, financial and market access resources

The example of warehouse receipts illustrates the difficulty farmers can face in accessing these products, or the difficulty of banks in extending these products. Warehouse receipts systems (WRS) are a heavily debated topic, with concerns often leveled at the banks that they only offer this product to certain types of customers. In reality, the ability to use warehouse receipts is a function of a client's ability to store product in a credible and credit worthy warehouse that is run by a credible operator. The bank extending the financing against any particular receipt is taking a risk on the warehouse. Therefore, the absence of an efficient and reliably regulated WRS has resulted in the market developing its own solutions. One of those is collateral managers, who act as guarantors for the value of produce and forge trust with the financial institutions. This results in a tripartite collateral management agreement between the banks, borrower and the collateral manager. However, one of the major drawbacks of this system is the exclusion of small-scale producers and traders, as the main users tend to be large-scale operators who own or can rent entire warehouses or silos and can afford the transaction costs. Hence, for small farmers accessing these facilities is naturally difficult unless they can be part of a FPO or some other aggregator organization. The legal and regulatory aspects of a WRS are covered in the accompanying Regulatory Report.

IV. INVESTMENT STRATEGIES FOR AGRICULTURE DEVELOPMENT: OVERVIEW AND CASE STUDIES

Agriculture remains at the heart of poverty alleviation, rural livelihoods, employment, and food security. There are many theories on how to approach the problems encountered in Indian agriculture, but no single approach is universally accepted. Indeed, the only broad truth seems to be that ‘there is no silver bullet’ for facing this challenge.

The developed world was able to move away from an agrarian economy over a long period time. The challenge for other countries such as India is to see whether this could be done in a much shorter period of time. In today’s world there is huge pressure to keep pace with the perceived benefits from manufacturing and urbanization and pressure on governments to execute development policies in a ‘responsible’ manner. There is also a body of opinion that argues that agriculture policies need to be focused on improving the welfare of the smallholder farmer that dominates this sector in many countries. This touches a larger debate on this topic and that will not be analyzed in detail here. Instead, the section below will describe a range of policies that have been used and then draw general conclusions about their impact in the context of the opportunity in the mandarin and coriander value chains in Rajasthan.

4.1 Agriculture Services Company: AgDevCo

Creation of an Agriculture Services Company has many parallels with the Development Corridors project in Rajasthan. As an example, the agriculture services company AgDevCo was conceived around the Beira Agricultural Growth Corridor in Mozambique. The broader corridor initiative was supported by a number of prominent institutions, including the Government of Mozambique, the Alliance for a Green Revolution in Africa (AGRA), the Norwegian government, the World Economic Forum, the Hewlett Foundation, and DFID from the UK.

The initial concept was to establish a Catalytic Fund around the Corridor within the broader initiative. The aim of the fund was to provide low cost finance to early stage companies, in particular those companies with a business model that links to smallholder farmers. The objective was to help them grow to a level where they could become sustainable and have access to more commercial sources of finance.

While the funding provided to the investee companies was structured to provide a return, AgDevCo itself was funded by grants or heavily concessional capital. This allowed AgDevCo to set up a team that could originate transactions that could evaluate and execute appropriate investments and monitor those through to any exit or refinancing. The model was designed such that any capital released from refinancing was to be re-circulated in the system. That would help the sustainability of the fund and it would mean that investments could be incubated without undue pressure of commercial exits by investors. Some additional funds were provided for technical assistance on a case-by-case basis.

Over time, the company has grown and the business model has evolved slightly. But by the end of 2015 AgDevCo had made 44 investments and deployed approximately $50 million in funds; they claim to have engaged over 22,000 farmers. They can provide funds as debt or equity but the main prerequisite for investment is a commercial business model being executed by competent management. They now have offices in 6 different African countries.

The business has continued to expand with additional grant funding from DFID and the Government of Norway, which has enabled AgDevCo to broaden their target market for investment beyond SMEs or early stage agribusiness companies. They now include possible investments in agriculture infrastructure and various related services. The strategy now is focused on raising additional capital and being able to make investments along the value chain.

A key advantage is that AgDevCo has been able to hire a high quality investment team and then supplement this in the field with local knowledge and industry experts. This has given them excellent operational management and a good quality investment process.

AgDevCo is on the verge of taking a major step forward if they can secure additional funding. They can become a substantial agribusiness company in Africa, with a portfolio that is diversified along the value chain and geographically. Their business model is currently designed to return capital on a net basis after costs. However, if the portfolio performs they will have substantial impact on strengthening the agriculture ecosystem in several African countries.

The key factors in their success to date have been:

- Access to patient capital,
- Ability to hire high quality team and to scale the business, and
- Adaptable management to modify business plan as needed.

Another significant factor was setting up the investment vehicle as a company with permanent capital rather than as a fund with a finite life. Many argue that funds are often unsuited to the investment needs of early stage agriculture companies. Such investments tend to have volatile business models and can suffer if decisions are made specifically toward specific dates for exit or monetization of the investment.

4.2 Private Equity: African Agriculture Fund, Rabo Private Equity

Private equity (PE) funds have become the favored investment vehicle for many institutional investors looking to invest into a sector or geography that is new for them. The PE model for the developed world is that investee companies are usually stable, mature companies that may be undervalued for a range of reasons. A PE fund will invest and take ownerships of the company and seek to rejuvenate performance through a new business plan and possibly new management. A mature company with established cash flows also allows the fund to refinance (leverage) its equity investment by raising debt. This has worked for the benefit of investors and fund managers across many countries and many industries.

There is a point of view that the traditional private equity fund model with a fixed maturity date and with a pressure to push investee companies towards a hard exit or monetization is inappropriate for the agriculture sector. This is particularly the case for investments in early stage companies or companies in the production phase of the value chain. Early stage agriculture projects often face the greatest risks. This is where the value chain is most exposed to 'natural disaster' risks whether it is weather or other similar events. Yet, perversely the higher risk does not always translate to higher returns or more robust cash flows.

Indeed, returns are higher in the downstream part of the value chain. Also, businesses at that end have a much greater ability to monitor their cash flows and financial performance. For this reason, the evidence shows that private equity investors will generally gravitate towards existing businesses at the downstream end of the value chain. These businesses offer much better opportunities for a planned exit or monetization, which is an important driving force behind private equity investments.

This can be illustrated by the investment portfolios of two private equity funds set up specifically for agriculture:

1) *African Agriculture Fund (AAF):* AAF is managed by Phatisa, a fund manager based in South Africa. AAF was set up after the G8 Summit in Aquila in 2009. A commitment was made to mobilize funds for food security. AAF was created primarily by the efforts of the French government but the funding is provided by a host of international DFIs. In total approximately $300 million was raised. Investors in the fund include IFC, AFD and FMO. For institutions such as DFIs a private equity fund is an attractive vehicle for investing in certain sectors where finding direct investments can be time consuming and require specific expertise.

   A number of investments have been made, and most of these are beyond the production phase, although there is one investment into a poultry business that does theoretically include an early stage phase. The current portfolio of investments includes companies in water purification, agriculture engineering, and fertilizer distribution among other investments. This is not intended as a criticism of the fund manager or of the private equity investment concept, but it is merely a comment that this model is more suited to downstream companies and may struggle with finding a large enough pool of possible investment opportunities.

2) *Rabo Private Equity Fund*: Rabo Private Equity Fund is a similar experience targeted at Indian agriculture. This too is funded primarily by DFIs including IFC, KfW, CDC, and FMO. All of these investors have instructed the fund manager to seek commercial returns beyond just the developmental benefits of helping the development of agriculture. This fund has invested its first fund and is now into its second fund. Once again the portfolio shows a dearth of early stage investments or investments in primary production. Indeed the portfolio includes companies such as Dawat Foods Limited, Sri Biotech Laboratories Pvt. Limited, and National Collateral Management Services Limited.

While there are similarities in the portfolio composition of the two funds, the Rabo experience shows that in India there is a larger and growing pool of potential investments and hence a greater opportunity for investors than in Africa.

As stated earlier, these comments are not to highlight any criticism of private equity as a product, but PE has often been better suited to downstream investments. If policymakers are seeking to have an impact in the primary production, they may need to adopt other investment models that are specifically targeted at that sector and funded with concessional capital rather than capital seeking commercial or near commercial returns.

4.3 Government Policy: Nigerian Incentive Based Risk Sharing System for Agricultural Lending (NIRSAL)

Most countries have a specific policy for agriculture. As already mentioned, all major countries provide substantial financial support for their agriculture sector. This support can take various forms from price support for produce to financial incentives for certain crops or subsidies for inputs. Some countries even have specialist institutions that create the framework for governing specific aspects of the value chain and assisting the sector overall. In India, these include agencies at the national level (for example, the National Center for Cold Chain Development (NCCD), Spices Board of India, and Warehousing Development and Regulatory Authority (WDRA)) and at the state level (for example, the Rajasthan Agricultural Produce Marketing Board, Rajasthan State Warehousing Corporation, and Directorate of Horticulture) and even a state supported financing institution (National Bank for Agriculture and Rural Development (NABARD))

Additionally, in India, various efforts continue to be made by the government to assist farmers with financial support on inputs, help with price stability for their produce, and provision of credit enhancement products that might help farmers access finance from banks or other financial intermediaries. Many developing countries wrestle with the problem of how to make a significant intervention in their agribusiness industry.

One challenge for government revolves around the failure of banks and commercial investors to embrace opportunities in the agriculture sector. With abundant availability of land and labor at internationally competitive prices, the lack of commercial activity can seem perplexing. While undoubtedly true, at the same time, it is important to realize that banks may be taking a rational approach and failing to lend simply because there is a dearth of suitable opportunities. In addition, government carries the responsibility to create a conducive enabling environment by undertaking policy and regulatory measures that encourage investment.

One such ambitious policy was recently launched by the government of Nigeria. This is the "Nigerian Incentive Based Risk Sharing System for Agricultural Lending" (NIRSAL) launched in 2012 through Nigeria's Central Bank. The overriding aims of NIRSAL were firstly to 'encourage bank lending to agriculture' and secondly 'to strengthen the agriculture value chain and ensure banks lend to businesses at all stages and in all sizes'. The overall policy was to deploy $500 million through the Central Bank. This would be done through five specific pillars:

I. *Risk Sharing Facility* ($300 million): Encourage banks by offering to shares losses on agriculture loans;

II. *Insurance Facility* ($30 million): Expand insurance products aimed at agriculture;

III. *Technical Assistance Facility* ($ 60 million): Help banks in lending to the sector and to train borrowers in financial management;

IV. *Bank Rating Mechanism* ($ 10 million): Create a system for rating banks on the effectiveness of their lending to the agriculture sector and on the social impact with the objective of making these ratings public; and

V. *Bank Incentives Mechanism* ($ 100 million): Give cash rewards to those banks that succeed in building their capabilities in agricultural finance.

In addition to this financial infrastructure, the government and central bank also announced a raft of policy initiatives to produce a more conducive regulatory environment. These policy changes proposed to make NIRSAL the central point of the overall policy on agriculture and to seek simplification of existing laws on insurance, procurement of seeds and fertilizer, and the credit guarantee scheme. Another area that the government focused on was streamlining laws on land use.

At face value this is an ambitious and in some ways an enlightened programme. This constitutes a substantial top-down move to increase activity in the sector. An institutional framework was created to implement and monitor these measures. Many of the proposed legal changes (such as those related to seeds and fertilizer) also remain to be undertaken.

However, it is too early to judge the efficacy of NIRSAL. More lending is definitely taking place, and banks have embraced the need or opportunity to increase their resources allocated to agricultural lending. But, such top-down policies to increase credit to a particular sector or to the economy broadly carry huge risks of creating 'credit bubbles.' Merely pushing or encouraging banks to lend more, especially with governments offering to share losses, ignores whether loans are made on a rational basis to creditworthy borrowers. This brings into question whether there are sufficient creditworthy businesses for banks to lend to and more broadly whether there is a sufficiently deep base of management skills to create the pool of businesses to absorb the finance being offered.

This policy also runs the risk of confusing how incentives need to be aligned to produce the outcomes needed. For example, offering cash inducements to banks based on the volume of credit extended can distort how banks behave. They may extend credit to marginal customers that over time may find it difficult to finance the loans.

A policy of this type will generally have a finite life. Governments cannot support subsidized credit extension indefinitely or certainly not in developing markets. Hence, policymakers need to plan for what happens once the credit extension is switched off. The hope would be that the policy has enough impact in the market to enable the main stakeholders to maintain their activities. That remains to be seen in the case of Nigeria.

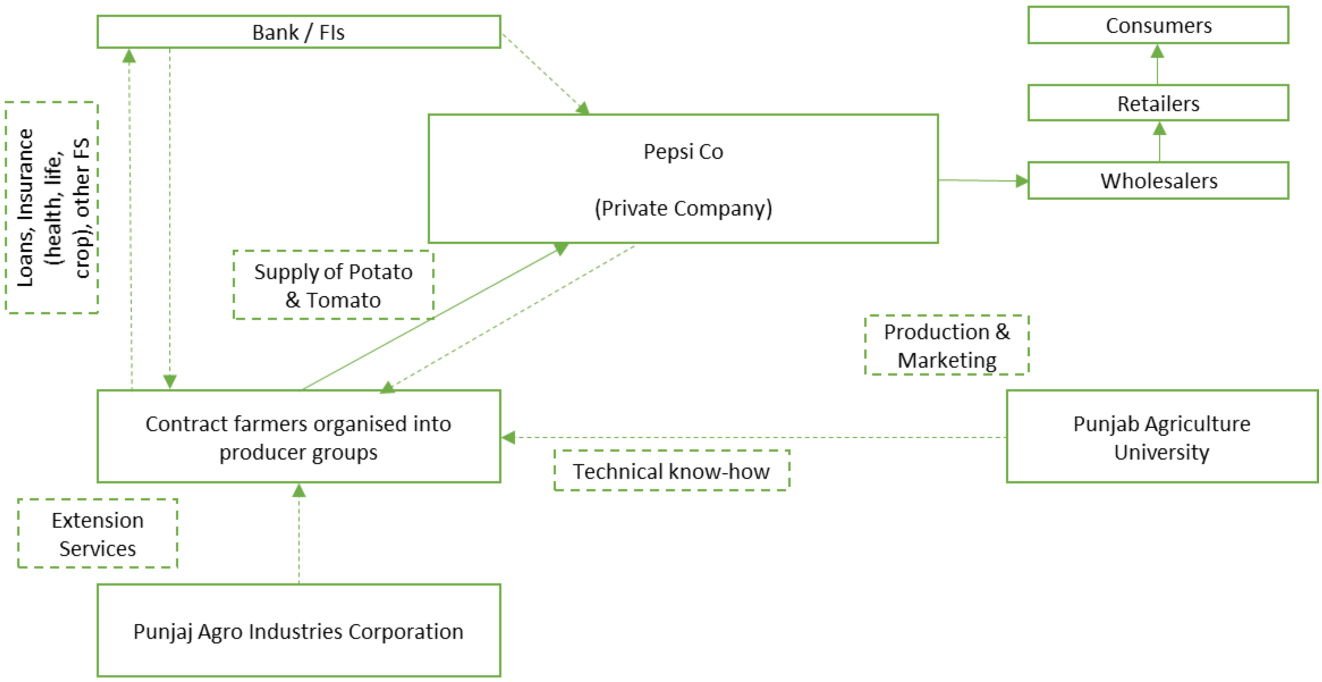
4.4 Foreign Direct Investment: PepsiCo in Punjab

Attracting strategic investors can have a transformational impact on a regional or even national economy. If this brings large multinationals into an economy, they can bring vast amounts of financial capital and also access to world-class skills and technical capability which can be absorbed locally over time. However, there is also the potential that such investments can go wrong if they are structured in a way that assimilates the foreign company into the local economy. In particular, they can become destabilizing if they distort local markets or value chains rather than supporting them and making them more robust.

There are different models for exactly how such investments can be structured. In part, this will depend upon the nature of the agricultural product in question, and, in part, it will depend upon what activities are being undertaken locally by the foreign investor. In theory, the foreign investor has the capacity to impact all aspects of a value chain from inputs all the way through to processing. In practice, however, foreign investors may only use local markets to source raw product for processing elsewhere. Yet, even in such cases, foreign investors will bring in expertise to enable local producers to raise the quality of their product and the general productivity.

Figure 5 below shows an investment made into Punjab State by PepsiCo. This is an initiative based on contract farming whereby PepsiCo was seeking to use a network of local farmers to procure potatoes for their Frito Lay processing facilities to produce potato chips. The basic model is for farmers to enter into a contract to supply product of a certain quality and at a certain price. In return, PepsiCo provides technical knowhow on how to achieve this higher quality product and how to manage the operations in general.

Figure 5 - PepsiCo Case Study: Funding and TA Flows



The local economy can benefit in a number of ways through the sorts of linkages shown in the diagram. For example, there can be knowledge transfer to local institutions that can then become embedded into the system.

There are always differences of opinion as to whether investments of this type are beneficial or not. This particular investment could be analyzed from a number of different angles. In this particular case, there are reports that some contracts were not formally signed or that small farmers did not know what they were signing. But in general, the investment has been seen to be helpful for farmers. Indeed, the Food and Agricultural Organization of the United Nations (FAO) Report by Meeta Panjabi concludes, "the potato crisp supply chain to PepsiCo's Frito Lay is a good example of how international quality requirements are met by small farmers in India. A very strong extension network by the company helps to monitor and maintain quality at every level."

To ensure that projects of this type are seen to be enhancing for small farmers and rural communities, there needs to be some clear guidance on the regulatory framework focused on contract farming arrangements (See Regulatory Report) to ensure that contracts between the local farmers and the foreign investor are fair and transparent.

More recently, in 2016 PepsiCo entered another value chain in India by committing to build a juicing facility in Maharashtra. This is a landmark investment by PepsiCo and is part of the current 'Make in India' campaign being championed by the Indian government. Beyond the pure financial investment PepsiCo will be working with local producers to ensure knowledge transfer, skills enhancement, and access to better quality inputs including finance when needed. PepsiCo will be joined in the investment by Black River, a fund set up by the food giant Cargill.

4.5 Challenge Funds: African Enterprise Challenge Fund

Challenge Funds have been used by donors to allocate capital towards specific markets or sectors. In recent years, a number of such funds have been set up across developing markets. Two of the larger and more notable funds have been sponsored by DFID, including the Girls Education Fund, aimed as supporting innovative models for girls education, and the African Enterprise Challenge Fund (AECF), which is aimed at agriculture in sub Saharan Africa.

For this project, the findings and learnings from the AECF could be helpful. The fund is supported by the governments of Australia, Denmark, Netherlands, Sweden, and the UK. Plus, it is also supported by the International Fund for Agricultural Development (IFAD), which is already very active in India (India is IFAD's largest borrower). AECF's aim is to originate and support business ideas that can enhance rural incomes or support businesses that link small farmers to markets. AECF organizes a series of competitions, at which time different businesses seek financing by presenting their business plan and the intended use of proceeds. AECF has stipulated that each business that receives funding from them (which is given as a grant or concessional capital) must also procure private financing alongside, which is intended to give the idea commercial validation.

Since 2008 when the AECF started, over 200 projects have been approved and are estimated to have helped over 7 million rural people. AECF has an appointed manager that administers the challenge process and then monitors the investments to ensure that intended metrics are met.

Some of their recent investments show the impact such a fund is capable of. In 2016, a \$500,000 investment was approved in Outgrowers Tanzania Ltd. to create processing hubs for cashew nuts and then enable different clusters of smallholder farmers to utilize those regional processing units. This gave them stronger links to retail markets and hence enabled them to raise incomes for the target area. Over time, the processing units will be acquired by the clusters of farmers who are being serviced, and Outgrowers can then move on to embrace a different set of farmers.

Also in 2016, \$620,000 was allocated to Best Tropical Fruits Ltd (BTF) in Kenya, intended to enable them to build a processing plant for mangos closer to the areas where the fruit is being produced. BTF will provide extension services to enable the farmers to meet the quality requirements for the fruit that is produced. This will work as a contract-farming model for the region. Once the system is seen to operate efficiently, its geographic reach can be expanded and other fruits added.

The great benefit of a Challenge Fund idea is that it can be used to accommodate a very wide set of ideas and businesses. A general remit may need the ideas to offer new solutions for enhancing a particular value chain or a particular region. Beyond that it can set whatever parameters it deems appropriate to its mission. A Challenge Fund can also be particularly useful for seeking innovative ideas or ideas that embrace technology.

VI. INVESTMENT OPTIONS FOR RAJASTHAN

The general analysis of agriculture and possible investment vehicles that preceded this section is an important part of developing specific recommendations for the Rajasthan Government, particularly with respect to developing recommendations for designing an investment and policy framework for strengthening the target value chains. By identifying the key challenges, it is possible to create an investment strategy for agriculture in Rajasthan with a particular focus on the mandarin and coriander value chains. Our evidence from the field indicates that the challenges that can be addressed through targeted investments are as follows:

Key Challenges in the Agricultural Value Chain

Fragmented Land Holdings

Access to Inputs: In particular in the coriander value chain there is a lack of good quality root stocks and seed

Lack of Effective Aggregation Models*:* FPOs are still nascent but they can be highly efficient to enable farmers to link more efficiently with markets and the broader value chain

Poor Knowledge of Technology and Input Usage: Better access to good quality agronomy advice like appropriate pesticides and fertilizer can be hugely additive for productivity

Lack of Infrastructure: On farm and near farm infrastructure remains fairly weak. This includes facilities for pre-cooling, grading, cleaning, packing and where appropriate waxing. This is needed to strengthen production and give farmers more stability in their revenue model. Additionally, in some places last mile infrastructure also needs to be upgraded.

Lack of Suitable Storage Facilities*:* This influences farmers' decision of when to sell produce; inadequate storage facilities mean that farmers often have to sell too soon and hence not realize optimum value for their crop

Lack of Processing Facilities*:* Inadequacy of processing facility in the state results in raw produce transported across state borders (for instance, to Gujarat or Madhya Pradesh) for value addition.

Lack of Insurance Use*:* Without insurance, many farmers are unable to make fairly simple risk mitigation arrangements.

Lack of Access to Finance*:* For most farmers, this makes planning more difficult. Also, the need for cash pushes them into suboptimal decisions for selling their produce.

Subscale Farms*:* This limits the benefit that can be achieved from natural economies of scale; small farmers don't have proper bargaining power in finance or with other parts of the agribusiness value chain

Inadequate Mandi Infrastructure: Storage, processing, transport and testing facilities at mandis must all be upgraded.

Lack of High Quality Packaging*:* Limited use of crates for packaging causes damage for transportation of produce, particularly mandarin

Lack of Scale at Wholesale Level: This means that these businesses don't benefit from natural efficiencies and hence lack the resources to invest.

Lack of Export Quality Commodities: Only a small portion of the coriander or mandarin produced in Rajasthan is seen to have the quality to compete in export markets.

Lack of Strategic International Investment: Thus far Rajasthan has not benefitted from large, strategic international investors. This could be explored further for certain crops (other Indian states have recently attracted significant investment from large international groups such as PepsiCo, Coca Cola).

As listed above, challenges exist across the value chain. Any investment approach designed to strengthen the sector needs will need to address these gaps and also take account of the specific characteristics of the agricultural sector. For example, there are parts of the industry where normal risk return relationships fail to apply. This is particularly the case with primary agriculture businesses where the risk is often very high owing to the exposure to natural risks in addition to operational and financial risks, and the returns can be modest, unless there is also the scope for appreciation in land values.

Similarly, taking into consideration other critical aspects such as fragmentation of holdings, poor financial records, and heavy government support, one needs to be realistic in designing investment initiatives for countries that have recently benefitted from high rates of growth. Agricultural policy cannot always be left to the market. There needs to be a realistic assessment of situations where concessional capital may be needed to support or even incubate a specific business or part of the value chain. This is not a weakness in the system but simply a realistic assessment of the economics of agriculture.

Additionally, when designing an investment strategy, the role of the development community, including governments, DFIs, and NGOs must be taken into account. Given the huge impact of agriculture on living standards, rural incomes, employment, and food security, it is a major priority for them and they have access to capital. Therefore, they must appreciate the value of making this available as grants or concessional capital rather than capital expecting market returns.

In light of the general framework presented in this report, the empirical evidence from fieldwork, and a targeted workshop, we can establish a number of priorities that need to be addressed by this initiative.

Priorities for Investment Initiative:

Focus on meaningful impact on farmers' and rural incomes

Explore aggregation models that can work and which can be scaled up

Develop investment solutions for near farm and regional hard infrastructure such as storage, coolers, packaging and logistics

Upgrade local technical knowledge of agriculture and how to interact with the value chain

Incubate new pro-poor technologies and use them in agribusiness

Create business models that can access finance more efficiently

Explore different providers of finance and how they can be harnessed for the benefit of agribusiness borrowers; this can include MFIs and regional banks as well as larger national banks

Improve quality of produce

Explore export markets

Investment Structure

To structure and implement an investment initiative for the Kota region, the findings, analysis, and fieldwork will shape the investment intervention. It is also important to recognize that just as there is no silver bullet to solve the challenge of agricultural development, and there is no single investment structure that can by itself meet all of the objectives. Experience shows that governments and private market investors have used many different investment structures; therefore, the ultimate portfolio selected is a matter of choice for the key stakeholders. Whatever the structure, there need to be oversight and governance processes that satisfy the providers of the funds.

Fundamental Questions to Determine Investment Structure in Kota

Where will the funds come from for the investment?

Is it a single donor or more than one donor?

Is the World Bank providing capital?

Is there broad alignment on the investment objectives?

Are donors providing grants or concessional capital or is it in the form of capital seeking commercial return?

How will the funds be deployed?

Will the money simply be given to the local government to deploy within an agreed set of guidelines?

Will the funds be deployed by an NGO or DFI? If so how will they be selected and monitored?

Will there be a fund structure, which needs an independent fund manager? If so, how will the manager be selected, how will they be incentivized and how monitored?

Could the funds be deployed by an existing entity, such as a regional NGO or a private financial institution?

What type of investment vehicle will be used?

- Private equity style fund
- Corporate structure with permanent capita
- Direct investment into companies or projects which could be in the form of debt, equity or even as subsidies
- Hybrid structures where one or more donor allocate concessional capital to form the equity base which is then augmented by capital from various commercial sources

These are not theoretical questions. From the agricultural development space, the India Agri Business Fund (managed by Rabo Private Equity Advisors) and the African Agriculture Fund (managed by Phatisa) are both traditional private equity funds but where the investor capital is all from the DFIs. These could be instructive in establishing a structure for Kota division once the questions above have been answered.

AgDevCo, discussed above, is also an illustrative example. AgDevCo was set up as a company with permanent capital, which came in the form of grants from DFID of the UK and the Government of Norway. AgDevCo allocates capital on commercial terms to businesses that demonstrate a robust business model and a capacity to deploy such funds. It does, however, ensure that the financing structures avoid heavy cash flow burdens on early stage companies by deferring interest costs or using hybrid debt instruments.

In contrast, hybrid structures (such as the example of the African Agriculture and Trade Investment Fund sponsored by BMZ and KfW of Germany) can in theory attract Public and Private investors. In this structure, there is a junior tranche of ‘first loss’ capital that is committed by certain donors, which can be leveraged by other tranches of senior capital on more commercial terms. KfW commonly uses this structure.

Recommended Strategy for Rajasthan

As noted, there is no single strategy or investment option that can provide the silver bullet for agricultural development in Rajasthan in general or in the Kota division in particular. Accordingly, we would recommend a portfolio of initiatives designed around the priorities of the region and the objectives of this project. Thus, we will outline six investment propositions in order of priority. These are designed to address some of the important issues highlighted by our analysis and by the conversations and meetings with stakeholders in the region.

1. ***Early Stage Fund (Recommended Initial Size $20-25 million)***

The Early Stage Fund is designed to tackle perhaps the greatest challenge in helping to address rural poverty and spur agriculture value chains in the region. The most vulnerable part of the value chain is the production phase, which is populated by a large number of small farmers. The fragmented nature of land holdings and the small farming units create a significant problem for Indian agriculture, both broadly and specifically for Kota division.

Solving this issue is complex. Previous efforts by the state to encourage the creation of cooperatives and other such collective entities have had some success but eventually came unstuck when excessive political interference and other factors impacted their efficiency and productivity. Therefore, aggregation remains a crucial issue to date, and the relatively new model of FPOs is attempting to address it.

The Early Stage Fund offers the opportunity to work directly with FPOs, cooperatives and other aggregators in the region to create sustainable business models. Key aspects of this Fund must be

i. **Business Plan:** Funds should be allocated to entities that can demonstrate robust business plans by which they can aggregate the production of groups of small farmers. They should outline the benefits for the farmers and the vision for a 3-5 year plan.

ii. **Management Team:** An important part of the business plan should be the availability of a strong management team. This team must demonstrate the credibility in the region to consolidate groups of farmers but must also demonstrate the business skills to manage the business towards a sustainable future. Where necessary, training and technical knowledge can be made available, but its success will depend on finding management teams that can succeed and which have the incentives to create sustainable models.

iii. **Selection of Aggregators:** Fieldwork has shown that a number of potential FPOs are being promoted in the Kota division. There are also other aggregator models, such as Gram Unnati Foundation, that are working in the state which could be incentivized to operate specifically in Kota. The process of selecting which entities to support has the potential to become highly politicized. Our recommendation would be to have these funds managed by an independent team. Such a team could be selected through a tender process to provide further transparency in the process and to give the team credibility in the region.

iv. **Financial Support:** After identifying a portfolio of aggregator companies and FPOs, in the first instance financial support must be provided that allows the groups to hire people and build and execute on their model. Over time, the Early Stage Fund should work with the chosen team to help them build scale and expand their activities as appropriate. Investments that don't succeed and where the chances or recovery are small should be abandoned. That type of decision would also be difficult if the team was politically influenced, since there might be an incentive to keep a failing group in business simply to avoid the political fallout of failure.

v. **Benefit to Farmers**: Success would be defined as building a group of resilient and sustainable aggregator models that offer the benefits of membership to a large and growing number of small farmers. The farmers would benefit from better access to inputs, finance, and better linkages in the value chain. In time, there may even be grounds for further consolidation between aggregators themselves.

vi. **Regulations and Governance Policies**: It is vital that this Early Stage Fund is supported by a set of policies and regulations that enable the FPOs to operate efficiently and attract members relatively easily. Such regulations need to ensure that the rules under which such entities are created and the bureaucratic burden they face in their operations is minimized. It must be remembered that FPOs are in essence SMEs that will not have the luxury of large administrative teams. Therefore, policies and regulations must enable member farmers to easily and effectively interact with funders, regulators, and administrative officials

It is envisaged that this Early Stage Fund would receive grant capital from donors or other public sources and that the funds would be deployed by the manager in the form of concessional capital or, in certain cases, outright grants. But there must be a recognition that the concessional funds will only be provided once there is a proven business case and a plan supported by a management team that is suitably incentivized to build a sustainable model.

2. *Training Facility (Recommended Initial Size $5 million)*

The need for access to technology and latest agronomy techniques was highlighted by many stakeholders during the course of this project, including individual farmers, financial institutions, and government officials that operate in the sector. The case for allocating funds for training purposes is, therefore, fairly clear-cut. But there may be some questions on how best to allocate the funds. Our recommendation would be to create an overall strategy for training in conjunction the local administration and then have the funds managed by an independent NGO, for example TechnoServe, which would be able to not just manage the funds but also provide input from their experience in other similar projects in agriculture and across other markets.

There is already some institutional network in the form of various active COEs for crops such as citrus. These could be upgraded and their technical capabilities could be enhanced through hiring more specialists in various fields of agronomy that are pertinent to the local economy. However, beyond the training in agronomy, basic management skills also need to be available. Most specifically, these relate to finance, investment, and the use of technology, but they can be expanded further. The COEs focus largely on agriculture, but they might also be used to house other types of capabilities, since the same group of people (farmers and agricultural stakeholders) would be the beneficiaries.

In addition to specific skills in agriculture and business, having an institutional framework also allows scope for a forum to provide knowledge regarding regulatory and legal issues. This could cover a range of issues, from increasing understanding of specific laws/regulations and their implication to helping farmers understand the support schemes and programs that are available from the government or public entities.

There could be a link between this Training Facility and the Early Stage Fund, whereby investees of that Early Stage Fund are able to access appropriate technical assistance from the Training Facility if and when helpful.

3. *Innovation Fund (Recommended Initial Size $5 million)*

India has shown itself to have an excellent capacity to innovate and apply technology across basic industries. There is the potential to harness this capability for the benefit for the agriculture sector and, if managed appropriately, for the benefit of the rural poor. Currently, there are venture capital funds such as Omnivore and Ankur Capital seeking to back companies that provide innovative models for agriculture. Those funds have been able to attract institutional capital for their funds.

In Jaipur, Startup Oasis is in place with financial backing from RIICO, an agency of Government of Rajasthan, to support innovation in the region. With a small amount of capital support, this infrastructure could be used to launch an initiative that is focused specifically on agriculture. The remit of this initiative could be refined further to give preference to technologies that benefit directly the farmers and rural poor.

The objective of an Innovation Fund would be to find and scale successful innovations. Most such companies wither because they lack access to capital. Thus, it is important that this fund has sufficient resources to properly incubate innovative companies and ensure that they are properly attached to other sources of capital. This may be needed for individual companies seeking growth capital to support their early years.

Currently, Startup Oasis is backed by public funding, and we recommend that incremental capital for the purposes of starting an agricultural initiative is also provided as a grant. The objective would be to encourage innovation rather than to create a venture capital business. However, there could be some arrangement that allow initial investments to be recovered from companies that are able to grow and then have access to venture funds or other commercial sources. On this basis, the capital recovered could be recycled by the fund. Startup Oasis would be able to create a proper business plan for this. Initial indications show that a figure of $3-5 million should be sufficient for a five-year period.

4. ***Growth Capital Fund (Recommended Initial Size $20-25 million)***

The Early Stage Fund described above would be aimed at the production phase, with a particular focus on models that support aggregation. It could also support other elements of the ecosystem that are important during that phase of the value chain. At the same time, financial support is also needed further downstream in the value chain, which could be achieved through a Growth Capital Fund. Fund targets could include companies involved in stages from storage to logistics, processing, and marketing. Companies at that end of the value chain are often more resilient, and they often have a more structured business model and can access other sources of finance. The important elements of Growth Capital Fund would be:

i. **Targeted Region/Needs**: In certain cases, access to capital can be difficult for various reasons, and a regionally targeted fund may be useful to unblock certain impediments in the value chain. Such investments could be very targeted at a particular company or specific need in the chain or they could be used to enhance a regional capability that might benefit more than just the value chains being prioritized by this project. For instance, there may be an investment into a mandi to upgrade infrastructure facilities, enhance storage, and update technology. The advantage of such an investment is that it could benefit all the products that pass through that mandi and not just horticulture and spices.

   There is a counterargument that businesses at the downstream of the value chain have better access to the financial markets more broadly and, therefore, do not need an initiative of this type. But we would argue that there are numerous imperfections in the system of agribusiness finance in India that a fund of this type could work alongside private pools of capital, to make the overall regional value chain more robust. Rather than ignore the downstream areas of the value chain completely, there is room to offer capital to such companies/entities on less concessional terms. In that way, a fund of this type could create a model of sustainability that would at some point help it to rely upon its own income or access to private markers to sustain its activities and to fund its growth.

There may also be room to offer capital to larger companies to expand into the region. This could be done by investing in projects or particular initiatives rather than by offering subsidies. The fund is not established to take the role of the government or the regional administration.

ii. **Fund Manager:** An independent fund manager would be needed to manage this pool of capital. This fund manager would need to have the skills to make more commercial investments where appropriate.

iii. **Grant Funding**: While there may be potential in a Growth Capital Fund to offer capital on less than concessional terms, in the first instance the fund itself should be established with grants. There is precedent for this type of arrangement in AgDevCo (discussed above), which is funded by grants from the UK and Norway but allocates charges for the capital provided to companies, even though the charges may be deferred or paid through some form of equity upside. Having access to grant capital or concessional capital would allow the fund to hire a top quality team, which is important when making investments of this type.

iv. **Governance Mechanisms**: Mechanisms that regulate the operation and management of the fund are critical. These could be in the form of guidelines for the manager, which would need to be agreed and have enough development benefits to attract pools of development capital.

5. Farm Services Company (Recommended Initial Size $5-7 million)

An innovative model shared by certain leading banks is the creation of a Farm Services Company that would work with aggregators and other early stage businesses to enable farmers to enhance the financial traceability of their produce and allow them to capture the cash flows related to their activities much better. Key considerations for a Farm Services Company include:

i. **Service Provider:** A company that manages and provides many services needed by aggregators or small groups of farmers could be instrumental and provide regional logistics and storage solutions as well as be a source of inputs and help producers get better connected to off-takers. Most importantly, a service provider could provide financial and systems support that would help farmers and aggregators improve the traceability of their produce and, in turn, become able to produce better quality financial statements for their businesses. This would help them have much better access to bank finance or to financial intermediaries more broadly.

ii. **Management Team:** Creating a vehicle of this type needs a number of resources at the outset. Most importantly, it needs a good quality team that is experienced in the sector and has the range of skills needed to manage the business itself and be able to build relationships with other companies that are needed to enable growth to take place.

iii. **Concessional Capital:** Equally important is that this investment needs access to a pool of concessional capital to finance the creation and build out the business. It is likely that sufficient capital will be needed to finance a 3-5 year period during which the business model can evolve; ultimately, it can be determined during this initial period whether the model can become sustainable and commercially viable without concessional capital.

Clearly, if the revenue model is seen to be robust then at some point the cash flows would support bank financing or access to more commercial sources of finance.

6. Financial Services Facility (Recommended Initial Size $10 million)

Access to finance in a timely and cost effective manner remains one of the major challenges in agriculture. The problem is acute in early stage primary agriculture but remains an issue through much of the value chain.

In states such as Rajasthan and in particular within the Kota region, there should be an assessment of the degree to which the local economy can rely on the large national banks for access to banking services. Regional banks could be given a much greater role through a Financial Services Facility designed to increase access to finance. Key considerations of this investment facility include:

i. **Local Banks**: In Rajasthan, local banks such as the Bank of Bikaner and Jaipur can and should play a greater role. Their capabilities could be expanded both in terms of size of their lending capacity and also the range of products they can offer. For this, the World Bank or another DFI may seek to analyze the capacity of local banks in Rajasthan to absorb technical assistance and possible access to extra capital that might expand their activities.

   There are examples of this type of initiative already taking place in India. In Andhra Pradesh the IFC has contracted to work with the Andhra Pradesh State Cooperative Bank to provide assistance in improving their credit approval process, tests for suitability in new lending (to stop lending to over-indebted farmers), risk management, and improving access to funding. This is designed to help expand the range of products that the bank can offer and design products that might allow more lending to primary producers. Where appropriate, they can work to expand services into rural areas and set up systems that can allow their credit process to function in a more effective way.

ii. **Microfinance and Insurance Companies**: While this has not been explored fully for the Kota division, there is potential to deploy a pool of capital to work directly with microfinance institutions or insurance companies to explore how activities could be increased. Clearly this needs to be done in a way that does not compromise credit standards and must be an initiative that the management of the local bank will support.

iii. **Collaboration with National Banks:** The objective of this type of facility would not be to crowd out the national banks or in some way to discriminate against them but rather to build local capacity that can complement the activities of the bigger banks. The local institutions could also be a source of business or partners for the national banks.

iv. **Concessional Capital:** These initiatives could be directed at specific parts of the value chain and may have a significant impact on the agribusiness ecosystem in the Kota district if they could be executed and supported by a pool of concessional capital that is large enough to support the activities for a period of around five years. These initiatives could be put in place relatively quickly, and, once the governance structure is created, they could begin to deploy capital in fairly short order. But they all need access to providers of concessional capital (like the World Bank or other donors). In some cases the capital could also be deployed in a way that it might be returnable at some point in the future. However, in most cases, the capital needs to be a source of permanent low cost capital for the fund or initiative in question.