Theme: Business models for farming

MODELS OF SERVICE DELIVERY FOR CASI IN THE EGP: OPPORTUNITIES AND CHALLENGES

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Abstract

This paper reports on investigations into models of service delivery for smallholder farmers in the East Ganges plains associated with the Sustainable and Resilient Farming Systems Intensification project with a view to providing cross-regional and cross-country comparisons of the context, design, performance, impact and sustainability of the models. Models developed and supported by project partners in the Dhanusha and Sunsari districts of Nepal; Coochbehar and Malda districts of West Bengal, India; Purnea and Madhubani districts of Bihar, India; and the Rangpur-Dinajpur districts of Bangladesh were investigated. Evidence was collected from organisation documents and interviews with model participants and stakeholders. Most were producer group models, supported by government or NGOs, along with two commercial service models supported by NGOs. Groups focused on farmer productivity, with some extending to provision of input, machinery and marketing services. Some may prove sustainable and suitable for scaling out and could be adopted by government, donors and NGOs, but cooperative models have inherent weaknesses. All will require continuing support to build and maintain capacity, while government should also focus on improvements to the enabling environment.

Keywords: smallholder farmers, service provision models, enabling environment

Introduction

Smallholder farmers in the Eastern Gangetic Plains (EGP) of Bangladesh, India and Nepal, are amongst the poorest in the world and are largely responsible for feeding one of the largest and most concentrated populations of people. A Sustainable and Resilient Farming

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Systems Intensification (SRFSI) project, managed by the International Maize and Wheat Improvement Centre (CYMMYT) and funded by the Australian Centre for International Research (ACIAR) has been investigating options to improve food security in this region. Investigations have focussed on the potential for conservation agriculture and sustainable intensification (CASI) technologies, and institutional innovations that strengthen adaptive capacity and link farmers to markets and support services to assist farmers in the EGP to improve their productivity, income and food security. CASI technologies include a range of innovations such as zero tillage machines (strip tillage in Bangladesh) and chemical weed control. Since government only provides limited services, private sector service providers (SP) will be a key to the adoption of CASI technologies given the need for farmers to purchase crop inputs and hire machinery.

The objective of this paper is to evaluate the service delivery models associated with the SRFSI project with a view to providing cross-regional and cross-country comparisons of the context, design, performance, impact and sustainability of the models and recommendations for program managers and policy makers in the region about options for promoting improvements in service delivery for smallholder farmers in the EGP.

Features of service delivery models

The literature review provide background to the features of service delivery models, particularly those associated with their design, delivery, provision, sustainability and impact. An appropriate definition of a service delivery model (SDM) in this context is 'supply chain structures which provide services such as training, access to inputs and financing to farmers to increase their performance and sustainability' (IDH Sustainable Trade Initiative 2016, p. 4).

Organisational structure and function

Blackmore et al. (2015) provide some important features of service delivery models, including: who finances the service delivery; who pays for the services; level of availability and accessibility; level of competition between providers; quality of service; and bundling of services. They suggest, the key distinguishing variables are who finances the service delivery and who delivers the service (Blackmore et al. 2015; IDH Sustainable Trade Initiative 2016). Another key question is who pays for the service, but we only consider models that involve farmers paying directly for the service, although they may be subsidised or supported by government or NGOs.

As Kahan (2007) suggests, government, NGOs and the private sector often lead project design and execution when dealing with smallholder farmers because context makes it difficult for farmers to identify economic opportunities, or to design and initiate the activities to take advantage of them. Indeed UNIDO and GTZ (2008) argue that concerted public-private partnerships have been the basis for the construction of sustainable service delivery systems in many countries. The role of government has been 'in creating incentives to invest in new technical and entrepreneurial skills, facilitating collective action, developing and ensuring all kinds of quality standards, motivating investors to surmount technological lags, or avoiding too strong trade shocks that might have wiped out entire industries' (p. 40). In addition, government is responsible for moulding the economic and policy environments to support such developments and to adjust the policy environment as the process continues (Andre et al. 2018).

Who delivers the service is an important consideration and in the context of this paper we will consider commercial service provider models (e.g. agrodealer models, machinery service provider models, machinery centre models); producer group models (e.g. cooperatives or membership associations); public sector models; and NGO models.

Impact and sustainability

Blackmore et al. (2015) contend delivery of services should be financed by farmers either as individuals, as groups, or as an industry sector. This is problematic because some practices have public good benefits, where the farmers as individuals are not able to recover the costs of adopting the practices. Consequently, there is a valid argument for government to subsidise at least a proportion of the costs of delivery of the service in partnership with the appropriate providers of the services.

Financing options for sustainability

In theory, options for financing service delivery include: direct payment for services, indirect payment through membership fees of a producer organisation, indirect payment via levies on produce processed or marketed, and tax revenue collected from sales of product (generally exports) that are allocated to the fund research, development and extension, technical assistance and market promotion (Blackmore et al. 2015). In this paper, we are mainly interested in the first three. However, farmers may be involved in paying for all of these options and may also receive benefits and subsidies from programs financed by government from tax revenue, or donor and NGO programs.

Gender

Many of the tasks undertaken by farm women in the EGP, such as rice transplanting, weeding and threshing, are highly labour intensive. This is a lens that needs to be applied when evaluating the costs and benefits of the various service delivery models (Andre et al. 2018). Many public and private sector service providers in the EGP are overwhelmingly staffed by men, which decreases the opportunities for involvement of women as clients. Models that provide access to machinery that alleviates the grinding labour of tasks that are mostly the responsibility of women, should have precedence (Andre et al. 2018; Sims and Kienzle 2016).

Factors leading to better outcomes

A key issue associated with better outcomes was a broad focus when designing projects so they combined expanding production and agricultural innovations with developments in value chains (Andre et al. 2018; Blackmore et al. 2015). This involved partnering and multistakeholder platforms that fostered innovation and had longer lasting and larger impacts. However, no one model fits all contexts (Andre et al. 2018). Each intervention has to be designed to meet the needs of target groups and adapted to the context of the enabling environment and institutional characteristics.

Improving accountability of government, NGO and associated SDM programs by providing clarity of purpose and mandating appropriate reporting processes were suggested as a key to improving performance. This should be integrated with a monitoring and evaluation process to enable learning, encourage improvement and assess outcomes (Kahan 2007; UNIDO and GTZ 2008). Integrating and bundling services together was identified as important, in particular training, inputs and finance (Andre et al. 2018; Blackmore et al. 2015; Kahan 2007; UNIDO and GTZ 2008). Training and extension can lead to a demand for inputs, which in turn require financing, particularly if farmers are not locked in to traditional buyers who provide inputs and finance in return for accessing the output for sale.

A key constraint to positive interventions is a dearth of professional staff in the government, NGO and private sectors with the practical managerial, business and technical skills required to facilitate change, to provide effective management advice to actors in the supply chains, and to provide effective training (Kahan 2007). Government staff often have technical skills, but lack managerial, business and facilitation skills, while

NGO staff often have facilitation skills, but can lack technical, managerial and business skills. Most interventions provide capacity development to their staff and to farmers, but rarely for actors along the supply chain (Kahan 2007). If SPs are to be effective they also require training; agrodealers require technical and business training, while machinery operators require business and machinery operation and maintenance training (Sims and Kienzle 2016).

This is a complex and highly constrained process. As Andre et al. (2018, p. 114) suggest 'Time is essential for results to emerge'. Their investigations indicate that most successful interventions benefited from over a decade of support. Nevertheless, Murray-Prior et al. (2013) argue that unless donor agencies involved with initiating interventions plan an exit strategy right from the start, they may create a dependency culture or fail to create the linkages to organisations that will be required to support the group after the completion of the donor project.

Research design

The service delivery models studied were chosen from the models developed and supported by the partners of the SRFSI project in the Dhanusha and Sunsari districts of Nepal; Coochbehar and Malda districts of West Bengal, India; Purnea and Madhubani districts of Bihar, India; and the Rangpur-Dinajpur districts of Bangladesh. Each model was either designed or supported by government or an NGO and reflected the range of contexts for each of the locations.

Evidence about the models was collected from documentation provided by the support organisations for the particular models and from interviews and focus group discussions conducted during visits to the villages and districts where the models were operating. The interviews and focus group discussions were conducted with male and female farmers (either as individuals or as groups); farmer group leaders; owners and drivers (SPs) operating seeding and laser leveller machines; village, district or block Agrovets or input suppliers; village Community Business Facilitators (CBFs); machinery repairers and machinery dealers. These visits occurred in February 2016, September 2016 and February 2017.

Information from the interviews was recorded and then analysed along with documentary information obtained and developed into reports for each of the country/state locations. They form the basis for this paper.

Results

Categories of models and their services

Most of the models investigated can broadly be categorised as Producer Group (PG) models (Table 1) and take two main forms: farmer productivity groups that focus mainly on improving access to information, training, finance, inputs and sometimes machinery; and farmer business groups that are more formally organised and registered and tend to provide more commercial services such as machinery services, input supply, processing and marketing services in addition to the linkage services.

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Table 1. Categories of models and services provided

Model	Category of model	Services
iDE Community Business Facilitator	Commercial service	Regional, district, community level linkages between farmers & key actors in input chain Facilitation of input & machinery services to farmers
Indian Farmers' Club	Producer group	Access to information, training, networking, inputs, finance, post-harvest processing & storage, marketing services, machinery services
JEEViKA model of poverty alleviation	Producer group & NGO	Self-help groups & Community Business Organisation; inputs, processing & storing of inputs & outputs; marketing produce
Arayank Producer Company	Producer group & NGO	Buys & markets maize, buys & sells quality inputs to farmers
SAKHI model for socio-economic empowerment of poor women	Producer group &NGO	Women's self-help that addresses issues affecting women & access to credit, includes agriculture
DeHaat	Commercial service& NGO	Access to inputs, information & some machinery Portal for selling crops & purchasing inputs
RDRS Innovation Platform	Producer group & NGO	Information, advisory services, linkages to government, NGOs & private sector; Machinery services, inputs & marketing produce
RDRS Farmer Union Federation	Producer group & NGO	Non-agricultural services to community Information, advisory services, linkages to government, NGOs & private sector; Machinery services, input supply, marketing produce
Growing Together Farmer Centre	Farmer centre & NGO	Aggregation hub for crops, machinery hire centre, input supply centre, retail finance & business support centre

The iDE Community Business Facilitator model in Nepal is an example of a commercial service model, as is the DeHaat model in Bihar state of India. The iDE model relies on Community Business Facilitators (CBF) to link farmers with commercial SPs who provide inputs and machinery services, with the SPs providing a commission to the CBFs for the business they generate. The DeHaat model is a franchise model supported by the NGO

Farms n Farmers, with the micro-entrepreneur running the particular DeHaat, which is located in a village.

The Indian Farmers' Club, JEEViKA model, RDRS models and the SAKHI models are all Producer Group models either linked to an NGO or to government support and provide a range of agricultural services. However, the main focus of the SAKHI model is on empowerment of women rather than agricultural support services. The Arayank Producer Company is currently a hybrid of producer group and NGO model, but in the longer term is expected to become and independent company, albeit organised along cooperative lines. The Growing Together Farmer Centre Model is a more sophisticated hub of input and marketing infrastructure and services organised around farmer groups.

Organisational structure of commercial models

The iDE CBF model, involves establishing linkages at the regional, district and community level between farmers and key actors in the input chain: input and machinery dealers, agrodealers, ZT and laser levelling service providers and Community Business Facilitators (CBF). They have identified a gap between farmers and service providers at the node level and believe the CBFs will fill that gap. The role of CBFs is to promote services, bring farmers together with the service providers and therefore create demand for their services. Some are themselves farmers and act as commission agents for the service providers. iDE investigates and establishes links between machinery and input importers, dealers, Agrovets, SPs, CBFs and farmers to promote demand for services. It also provides training for CBFs in technical, business and facilitation skills necessary for them to fulfil their role and mentors them in the initial stages of establishment of their businesses.

The DeHaat model connects farmers with markets and provides inputs, information and some machinery. It has a kiosk with a computer attached to the Internet that provides a portal through which crops can be sold and inputs purchased. Farms n Farmers acts as a facilitator and connects buyers with sellers.

Organisational structure of Farmers' Club models

The Farmers' Club models are a structure specific to India, which now come under the Farmers’ Club Program (FCP) (NABARD 2008). Its objective is ‘Development through credit, technology transfer, awareness and capacity building’ and the clubs are assisted in

their establishment and operations by NABARD and others such as rural branches of banks, NGOs and Krishi Vigyan Kendras (KVKs). KVKs are agricultural extension centres created by the Indian Council for Agricultural Research (ICAR) and affiliated institutions at district level to provide support to the agricultural sector, with many coming under State Agricultural Universities. KVKs conduct testing and demonstrations of location specific technologies, undertake extension programs, including training and assist with sourcing of critical agricultural inputs.

After 2014-15, the FCP began to focus on strengthening, capacity building and training of the stakeholders so that successful Farmers' Clubs could become Farmers Producers' Organisations (FPO). The Indian government is promoting FPOs to collectivised farmers so that they can become registered under the companies act, with the objective of improving access of member farmers to investments, technologies, inputs and markets (Department of Agriculture and Cooperation 2013).

The Farmers' Clubs discussed in this paper range from mature clubs that started prior to 2005, to newly established clubs that started as a result of the SRFSI program and associated programs. The more recently established groups tend to take the form of producer groups, while the groups that have been established for a longer period have had a range of functions during their life (e.g. welfare clubs, credit clubs) and are now likely to undertaking business operations as well as productivity functions. Most clubs have both male and female members, although male members can represent the family.

In general, the various Farmer Clubs are organised as shown in Figure 1, with the Farmer Club being the linking mechanism to government, financial institutions, NGOs and input suppliers.

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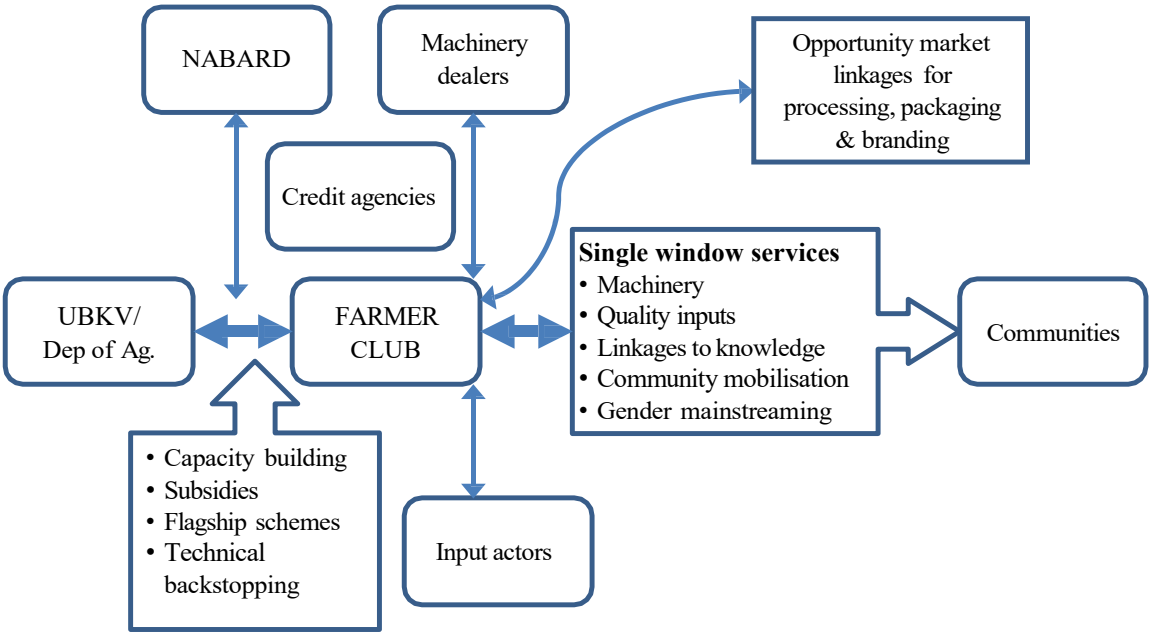
Figure 1. District level model of Farmers' Club providing services: Satmile Satish Club "O" Pathagar



Organisational structure of Bihar Rural Livelihoods or JEEViKA models

The original JEEViKA project was financed by the World Bank in the state of Bihar. It has since been given a national focus through the National Rural Livelihoods Mission (NRLM 2018), with the Bihar Rural Livelihoods Mission (locally known as JEEViKA), funded by the Bihar government, scaling out the JEEViKA model to all 534 blocks of the state.

Women in poor households in Bihar are organised into Self Help Group (SHGs), which in turn are organised into Village Organisations (VOs) and then into Cluster Level Federations, and finally into the apex organisation which is the Block Level Federation (BLF)(JEEViKA 2018). The number of women in a SHG is from 10-20, with most being from 10-15, with each group supposed to include at least 80% of members from poor HHs. Each SHG has a member who takes the leadership role as a community mobiliser. Members of SHGs have weekly meetings and are involved in making a weekly saving. A VO is initiated when at least eight SHGs in a village are functional with a membership of 12 and have saved weekly for at least three months (see Figure 2).

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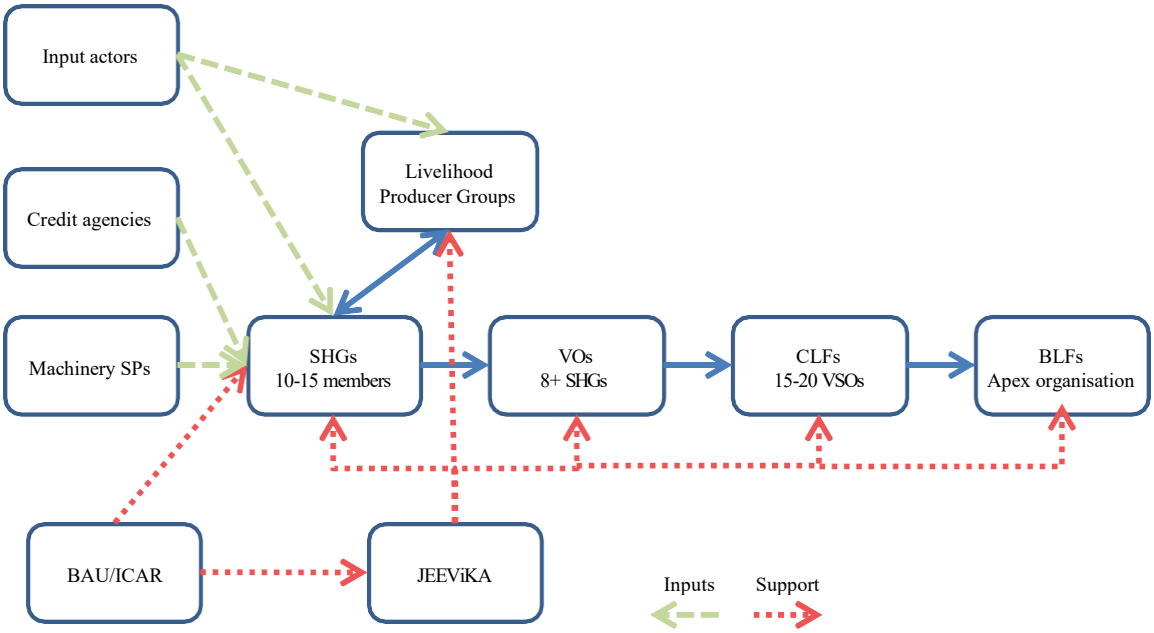
Figure 2. Actors in the JEEViKA model for poverty alleviation



SHGs – Self Help Groups; VOs – Village Organisations; CLFs – Cluster Level Federations; Block Level Federations.
BAU: Bihar Agricultural University; ICAR: Indian Council for Agricultural Research
Source: Adapted from JEEViKA (2018)

An additional strategy is to organise livelihood groups (Producer Groups or PGs) into Community Business Organisations (CBOs). The main functions of the CBOs are:

- Purchase or procurement of inputs for production.
- Local processing and storing of inputs and outputs.
- Marketing and selling of the produce.

These CBOs are supported by JEEViKA through assistance and training for management of enterprises, productivity enhancement, franchise management, quality enhancement and value addition skills. The Arayank Producer Company is an example of a CBO and is a producer company registered under the Companies Act. It started in 2010, with 800 shareholders and Rs.1 million provided by JEEViKA for its start-up. Each shareholder bought 10 shares at Rs.20 each, which is Rs.200 per shareholder. All shareholders are individuals and members of producer groups that have 40-50 members.

Organisational structure of the SAKHI model

SAKHI was formally registered as an NGO in 1999, but it had previously been involved with the projects of another NGO in North Bihar, ADITHI, which was supported by the Swiss Red Cross in Andhrathari Block of Madhubani District in 1990, aimed at

empowerment of fisherwomen(SAKHI 2018). Due to demand for its services it expanded to include the districts of: Madhubani, Araria, Darbhanga, Muzaffarpur, Motihari, Patna, Supaul, Arrah, Saharsa and Purnia.

The SAKHI model of socio-economic empowerment of poor women has similarities to the JEEViKA model, in that it focuses on the poorest of the poor women, but it has different priorities. Its main strategy for improving the conditions and empowerment is through the formation of SHGs and enabling them to access credit. It is also involved in addressing issues affecting women like domestic violence, alcoholism, dowry and trafficking. Its main activities are water aid, trafficking and sanitation, although it also supports some agricultural activities.

Organisational structure of RDRS Farmer Union Federation and Innovation Platform models in Bangladesh

Rangpur-Dinajpur Rural Services (RDRS) began in 1972 after Bangladesh's war of independence in the northwest region of Bangladesh and is now a national NGO that empowers the poor and their organisations to withstand adversity, improve access to their rights, entitlements, opportunities, resources and services by building their capacity (RDRS 2018). RDRS established Farmer Union Federations in the districts where it is working in Bangladesh to improve the social, economic, political and cultural living standards of landless, small and marginal farmers. They currently have 385 federations with a combined membership of 330,000 households, with a majority (227) formally registered with the Department of Social Welfare. Each Federation has around 800 – 1200 members, with an organisation consisting of an Executive Committee elected by the members of a General Committee. Most Federations have a large membership of women and also have youth forums. Membership of minority and indigenous and ethnic groups is encouraged.

The structure of a typical Federation includes farmer forums for both men and women, an information advocacy unit, theatre groups, a disaster management committee and an arbitration and mediation committee. They provide services and activities, including: reducing antisocial activity and increasing awareness of social issues; conflict resolution; improving disaster preparedness and auditing families affected by disasters; helping poor people to get government services and to access government safety net programs; and improving access to government and non-government services and resources. Many of these are not directly related to activities to enhance agricultural productivity, but

indirectly enhance the enabling environment for these activities. While the Federation Union Model could expand its mandate to incorporate the promotion of CASI technologies in the areas covered by RDRS, the more appropriate option is to use the social and human capital developed by these federations as a base for establishing Innovation Platforms (IP) as has occurred for the Mohonpur Union Federation.

The RDRS Innovation Platform model contains essentially the same components in all five nodes of the SRFSI project in the Rangpur-Dinajpur area (Kolkindo, Lakkhatari, Durgapur, Borodarga, Mohonpur). The two components are:

- An Agricultural Community Clinic and Information Centre (ACCIC) that provides information and advisory services.
- A business operation that purchases and provides machinery, quality inputs and seed production through contract farming, although not all nodes are involved in all activities.

ACCICs provide services, capacity building, linkages, information and logistic support with the assistance of the RDRS and the Department of Agricultural Extension (DAE) including: advisory services for crop production; identification of insects and pests; samples of seeds, fertilisers, pests and diseases; information about production techniques for the main crops in the node; training sessions facilitated by DAE, agribusiness input and marketing companies; farmer discussions and observations of demonstrations; linkages to government programs and incentives; and linkages to finance.

Each IP has developed business operations that provide services and generate money from: savings arising from regular contributions by members; income earned from commissions on quality seeds, fertilisers, herbicides and pesticides sourced from agribusiness firms, at a discount because of greater bargaining power, and sold to members (and in some cases others); hire of machinery, in most cases machinery used for growing crops with CASI technologies such as strip till (ST), bed planter (BP) and rice transplanters (RT); and contract farming for seed production of crops such as potatoes, rice, wheat, vegetables and spices.

Discussion

Apart from the iDE CBF model, all the models discussed involve a group of farmers with varying degrees of formal organisation, and are supported by government, educational institutions, NGOs, input suppliers and financial institutions.

Current effectiveness of the linkages

The iDE CBF model relies on CBFs to facilitate linkages between farmers and various service providers, particularly with respect to the promotion of CASI technologies. This is an entrepreneurial model that relies for its success on the skills and drive of the CBF, but also on support from iDE to build the capacity of CBFs and key actors along the input chain (e.g. ZT machinery operators) and facilitating support from regional Agrovets and machinery dealers for village Agrovets and machinery SPs. Where it has provided excellent linkages is along the supply chains for machinery associated with the CASI technologies, by linking exporters and dealers to SPs.

In the districts of Bihar, West Bengal and Bangladesh where the producer group models are operating, the JEEViKA, Arayank Producer Company, Farmers' Club, Growing Together Farmer Centre and RDRS Innovation Platform models are providing effective linkages to input, machinery, information, training and financial support. Some of the groups are also providing linkages to private and government buyers of produce. Importantly these models integrate and bundle services together, which was identified as important in the literature review (Andre et al. 2018; Blackmore et al. 2015; Kahan 2007; UNIDO and GTZ 2008). The linkages to the new CASI technologies also help to increase demand from the private sector for inputs and machinery services. While the SAKHI model also provides some of these linkages, most of its focus is on other issues, while its staff and management had less skills and involvement with agriculture and its model was not designed to develop business models that promote linkages along agricultural supply chains.

Comparisons of the context, design, performance, impact and sustainability of the models.

Currently, the CBF model in Nepal is not integrated well with the government organisations such as the District Agricultural Development Office (DADO) and the Nepal Agricultural Research Council (NARC), which are required to provide some of the

technical and training backstop. Unfortunately, this model relies on iDE having the goal and funding to continue supporting these activities until they become self-sustaining.

The Farmers' Club model operating in West Bengal has advantages for achieving impact and sustainability because it is supported by the enabling environment and government policy initiatives. Support comes from NABARD for credit and financial training, from both National and State governments with grants, subsidies, inputs, training, information and facilitation from KVKs and universities.

In Bihar, the JEEViKA model has some of the characteristics of a FC model. Its presence in all blocks (eventually), is supported by the State government and the National government, so in the medium term the model is sustainable. Key advantages of the model include that they have a development focus and facilitation expertise, trained staff at the block, district and village level supported by community professionals and are linked to the private sector and other NGOs that provide expertise where they lack it. The latter is part of their business model. Since they have continuing funding, are focussing on a similar goal to the SRFSI project, and have a process in place to develop ICT technologies, the model has potential for helping with scaling out of CASI technologies.

The RDRS Innovation Platform model in Bangladesh is also an example of a PG. An advantage is that they are linked to RDRS, the government sector, the private sector and to other NGOs (e.g. iDE Bangladesh) that provide expertise where they lack it. This collaboration has continued for many years. This model should be sustainable in the medium term and can be used over a large area. The key advantages include that RDRS have a development focus; facilitation expertise and proven record in facilitating the development of farmer groups; an integrated series of core programs that support projects such as microfinance, women's empowerment and monitoring and evaluation; and a network of trained staff.

In assessing the design, likely impact and sustainability of the various Producer Group models we need to consider that when they start to become businesses, whether they are registered as FPOs or not, they essentially take on the features of a collaborative or cooperative group. Consequently, they are likely to have some of the problems encountered by cooperative forms of structures that have been well documented (e.g. Lele (1981); Murray-Prior (2007)). If social capital is high, it is a source of strength, as members will work hard to help the cooperative work. However, there is often too much

emphasis on the patron role, with members demanding a low price for inputs or a high price for outputs, which can lead to financial problems. Additional problems include investment and governance problems. Critical success factors for cooperative forms such as these PGs are: a comparative advantage arising from market failure and trust among members (Murray-Prior 2007).

At this stage, the key driver for success of PGs appears to be that there is market failure in the sense that the provision of services required to support the adoption of CASI technologies is poor. There is a shortage of machinery, trained operators, herbicides, and importantly knowledge and skill in using CASI technologies. The models discussed above have addressed these issues, but importantly are also acting as farmer productivity groups through the opportunities they provide to access information, discuss problems and successful strategies, and provide training opportunities for their members. Whether their comparative advantage will remain as the private sector begins to become involved in the provision of services for CASI technologies remains to be seen.

Acquiring and maintaining professional management is a problem for cooperative organisations. The democratic structure of PGs makes it difficult to control managers, but also many farmer members of boards, some of whom many be illiterate, lack the skills to supervise managers adequately. Considerable time needs to be spent in developing leadership and management capacity of the PG leaders (and members) so that they understand and have the skills necessary to run businesses established by the group. However, assistance may need to be for up to a decade (Andre et al. 2018).

Recommendations for program managers and policy makers

Improving service delivery for smallholder farmers in the EGP will be a complex, difficult, costly and lengthy process. A key role for government is to ensure that the enabling environment empowers rather than frustrates or constrains efforts to improve service delivery(Sims and Kienzle 2016). There is therefore a need for each government to look at their policies and practices to assess whether they help or hinder the improvement of services to farmers and how and why.

To improve service delivery for smallholder farmers in the EGP there is a need to: have a broad focus that include: expanding production and developing the associated value chains (Andre et al. 2018; Blackmore et al. 2015); involve partnering and multistakeholder platforms; have a clear business and market orientation and don't create a welfare culture

(Kahan 2007); involve co-financing by farmers, government and industry, with funding separated from service delivery (UNIDO and GTZ 2008); include integrated and bundled services (Andre et al. 2018; Blackmore et al. 2015); incorporate training as required for the various actors and stakeholders in the intervention (Kahan 2007; Sims and Kienzle 2016); and improve accountability through appropriate monitoring, evaluation and reporting processes (UNIDO and GTZ 2008). Long-term investment and support (Andre et al. 2018; Kahan 2007) should be combined with an exit strategy for the donor agencies that addresses the need for institutional linkages to remain after the intensive intervention ceases (Murray-Prior 2007).

Conclusions

Most of the models of service delivery investigated were Producer Group models. In India the PG model was largely driven by government policy and institutions, while in Bangladesh it was driven by an NGO. The only Commercial Service model investigated in detail was in Nepal and this was driven by an NGO.

While the design and support structure for the PG models varied in each of the locations, they tended to have one or more of two main functions, a farmer productivity group and a farmer business group. Initially the focus was on establishing a viable farmer productivity group through bottom-up processes. These groups required minimal financial input apart from facilitation and capacity development of technical and group skills. Because of the bottom-up approach used to establish farmer productivity groups, their minimal requirement for project funds, their relatively low operational costs, their well-established linkages to government, NGO and private sector support, their simple marketing arrangements, and the benefits they provide to members, this model may prove sustainable and suitable for scaling out and could be adopted by government, donors and NGOs.

Some of these groups became farmer business groups that sold seed, fertiliser and machinery services and less often marketing services to their members. However, not all groups will have the capacity to become functional and sustainable business groups and those that go down this path will require lengthy capacity development and support for them to succeed. This adds considerably to financial and managerial complexity and risk of failure. More intensive capacity development will be required of the leadership of these groups in financial, managerial and business skills. A key factor will be the business plan that enables the business operations to be self-sustaining in the long run.

Our research and the literature support the view that the key role for government in promoting improvements to service delivery for smallholder farmers in the EGP is to focus in improvements to the enabling environment so that they help rather than hinder the delivery of services.

References

Andre, D., Maximo, T., Jason, D., & Douglas, H. (2018). Agricultural innovation and inclusive value-chain development: a review. *Journal of Agribusiness in Developing and Emerging Economies, 8*(1), 99-123, doi:doi:10.1108/JADEE-06-2017-0065.

Bista, D. R., Dhungel, S., & Adhikari, S. (2016). Status of fertilizer and seed subsidy in Nepal: review and recommendation. *The Journal of Agriculture and Environment, 17*.

Blackmore, E., Vorley, B., Molenaar, J. W., Gorter, J., Heilbron, L., Simons, L., et al. (2015). Service delivery: What does an effective service sector looks like to drive sustainability in smallholder dominated sectors? Washington DC, USA: Commissioned by IFC.

Datt, R., Kumar, R., & Kumar, S. (2016). Innovation Platform Development, Report prepared for the Sustainable and Resilient Farming Systems Intensification in the Eastern Gangetic Plains Project. Dhakar, Bangladesh: CIMMYT.

Department of Agriculture and Cooperation (2013). Policy & process guidelines for Farmer Producer Organisations. Ministry of Agriculture, Government of India.

Hoda, A., & Gulati, A. (2013). India's agricultural trade policy and sustainable development. *Issue Paper 49*. Geneva, Switzerland: International Centre for Trade and Sustainable Development.

IDH Sustainable Trade Initiative (2016). Service Delivery Models (SDMs), Insights for continuous improvement and farm impact. Utrecht, The Netherlands: IDH, The Sustainable Trade Initiative.

Jaim, W. M. H., & Akter, S. (2012). Seed, Fertilizer and Innovation in Bangladesh: Industry and Policy Issues for the Future. *Project Paper*. Washington, DC, USA: International Food Policy Research Institute.

JEEViKA (2018). Social Developments. http://brlp.in/web/brlp/social-development. Accessed 12th March 2018 2018.

Kaganzi, E., Ferris, S., Barham, J., Abenakyo, A., Sanginga, P., & Njuki, J. (2009). Sustaining linkages to high value markets through collective action in Uganda. *Food Policy, 34*(1), 23-30, doi:https://doi.org/10.1016/j.foodpol.2008.10.004.

Kahan, D. G. (2007). Business services in support of farm enterprise development. *Agricultural Management, Marketing and Finance Working Document No 13*. Rome, Italy: Food and Agriculture Organization of the United Nations.

Lele, U. (1981). Co-operatives and the poor: a comparative perspective. *World Development, 9*, 55-72.

Mottaleb, K. A., Krupnik, T. J., & Erenstein, O. (2016). Factors associated with small-scale agricultural machinery adoption in Bangladesh: Census findings. *Journal of Rural Studies, 46*, 155-168, doi:https://doi.org/10.1016/j.jrurstud.2016.06.012.

Murray-Prior, R. (2007). The role of grower collaborative marketing groups in developing countries. *Stewart Postharvest Review, 3*(6), 17: 11-10.

Murray-Prior, R., Concepcion, S. B., Batt, P. J., Israel, F., Apara, D. I., Bacus, R. H., et al. Experiences with the Catholic Relief Services' clustering process for agroenterprise development and some suggestions for improvement. In J. Oakeshott, & D. Hall (Eds.), *Smallholder HOPES – horticulture, people and soil: Proceedings of*

ACIAR-PCAARRD Southern Philippines Fruits and Vegetables Program Meeting, 3 July 2012, Cebu, Philippines, Canberra, ACT, 3 July, 2012 2013 (Vol. ACIAR Proceedings No. 139, pp. 181-189): Australian Centre for International Agricultural Research

NABARD (2008). Status Report on Farmers' Club Programme: 2007-2008. Mumbai, India: National Bank of Agriculture and Rural Development.

Nilsson, J. (2001). Organisational principles for co-operative firms. *Scandinavian Journal of Management, 17*(3), 329-356.

NRLM (2018). Welcome to Deendayal Antayodaya Yojana - NRLM. http://aajeevika.gov.in. Accessed 12th March 2018 2018.

Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Refinement and reassessment of the SERVQUAL scale. *Journal of Retailing, 67*(4), 420-450.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-Item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64*(1), 12-40.

Pradhan, K., Malhotra, D., & Mishra, G. (2015). *An overview of iDE activities in SRFSI (May 2014- June 2015).* Paper presented at the SRFSI Project Evaluation and Planning Meeting, Siliguri, West Bengal, India, 18-22 September 2015

RDRS (2018). RDRS in brief. http://www.rdrsbangla.net/rdrs-in-brief/. Accessed 13th March 2018.

SAKHI (2018). About SAKHI. http://www.sakhibihar.com/about-sakhi/. Accessed 12th March 2018 2018.

Sims, B., & Kienzle, J. (2016). Making Mechanization Accessible to Smallholder Farmers in Sub-Saharan Africa. *Environments, 3*(2), 11.

Takeshima, H., Edeh, H. O., Lawal, A. O., & Isiaka, M. A. (2015). Characteristics of Private-Sector Tractor Service Provisions: Insights from Nigeria. *The Developing Economies, 53*(3), 188-217, doi:10.1111/deve.12077.

UNIDO, & GTZ (2008). Creating an enabling environment for private sector development in sub-Saharan Africa. Vienna, Austria: United Nations Industrial Development Organization.