SDM: Case Report Digital Green

Service Delivery Model assessment: Short version

August 2017

Location: India
Commodity: Rice, wheat, maize
Services: Farmer training (video extension work), market access services (LOOP)

the sustainable trade initiative

NewForesight

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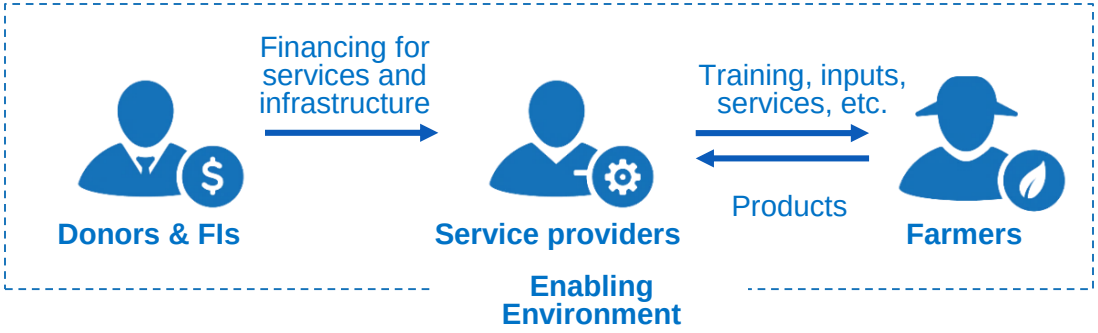
What are SDMs and why are we interested in analyzing them?

Service Delivery Models (SDMs) are supply chain structures which provide services such as training, access to inputs and finance to farmers. The aim is to improve farmers' performance, and ultimately their profitability and livelihoods.

A SDM consists of service providers, often supported by donors and financial institutions (FIs), and farmers receiving the services. All are set within a specific enabling environment.



By analyzing SDMs, we aim to support **efficient, cost-effective and economically sustainable SDMs at scale** through:

- Key drivers for success of SDMs benchmarking
- Innovation opportunities to support
- Cross-sector learning, learning community
- Convening at sector and national level

Analyzing SDMs brings a range of benefits

Farmers and farmer organizations

- **Enhanced services**, which lead to improved farmer income and resilience, through higher productivity and product quality
- **Improved SDM outcomes**, which lead to an improved social and environmental environment

SDM operator

- Better understanding of your **business case**
- Insights to **improve service delivery**
- Insights to develop **a cost-effective SDM**
- Identification of opportunities for **innovation** and **access to finance**
- **Comparison** with other public and private SDM operators operating across sectors/geographies
- Ability to communicate **stories of impact and success** at farmer level

Investors/FIs

- **Common language** to make better informed investment decisions
- Insights to achieve optimal **impact, efficiency and sustainability** with investments and partnerships in SDMs

The Digital Green SDM and objectives

General SDM information:

Location:	India
Timing and analysis scope:	2014-2020
Scale (start of analysis):	46,274 farmers
Scale (end of analysis):	65,000 farmers
Funding:	BMGF, USAID, CISCO, NRLPS, JEEVIKA, Goldman Sachs
SDM Archetype*:	Service focused

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- Digital Green is a not-for-profit international development organization that uses an innovative digital platform for community engagement to improve lives of rural communities across South Asia and Sub-Saharan Africa.
- In India, Digital Green partners with local public, private and civil society organizations to share knowledge on improved agricultural practices, livelihoods, health, and nutrition, using locally produced videos and human mediated dissemination.
- In 2016, Digital Green has reached over 416,000 farmers in more than 4,800 villages across India.

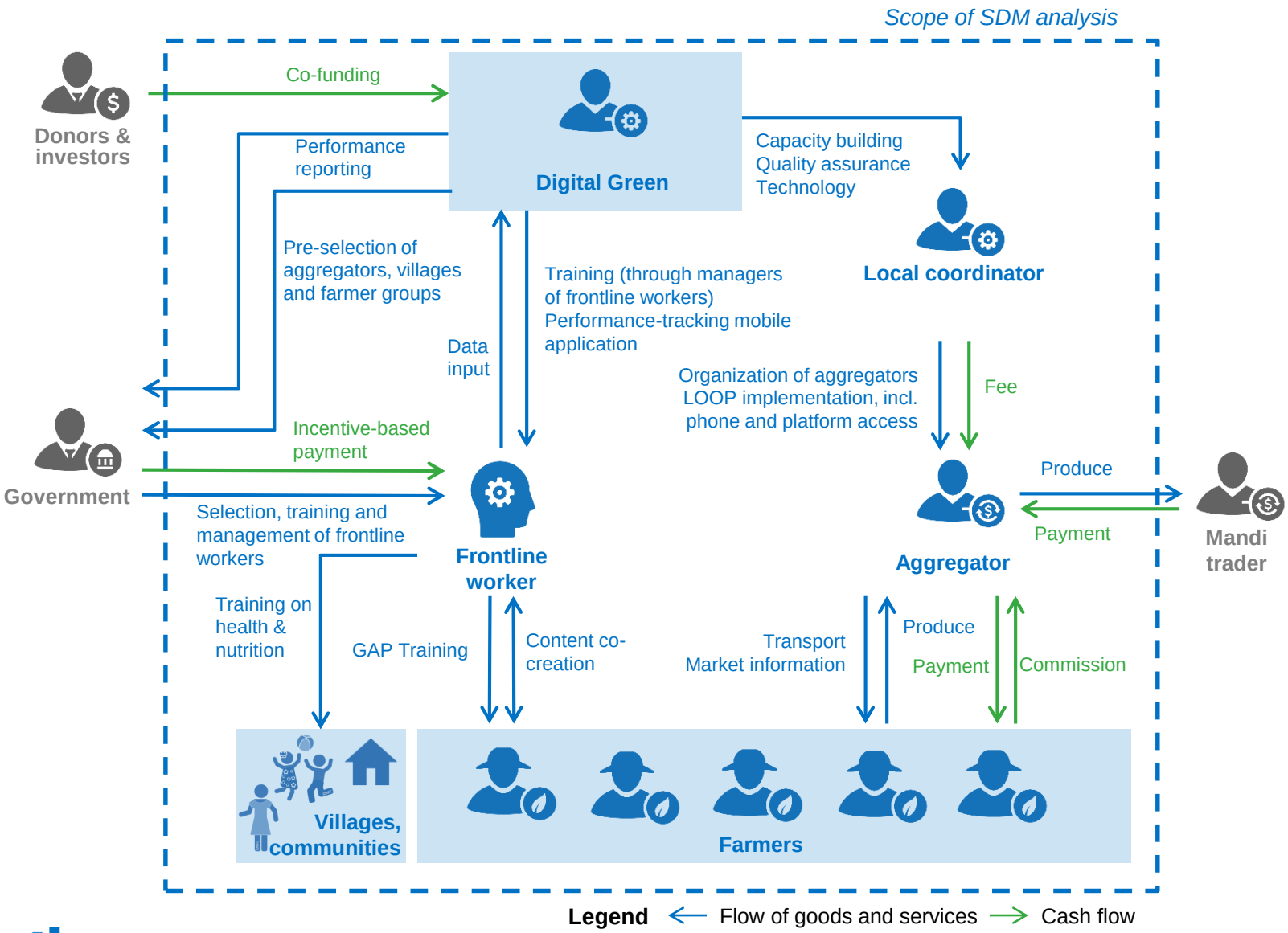
SDM objectives:

1. Improve farm productivity through training on good agricultural practices (video extension)
2. Improve health and nutrition practices in farmers' villages and communities
3. Improve farmer access to market by providing transportation and price & payment services (LOOP)

SDM rationale:

* For more info on SDM archetypes, see the IDH Smallholder Engagement Report

SDM Structure



Services delivered and enabling environment

Farmer training (video extension work)

- Digital Green supports the government in building capacity of frontline workers to produce and disseminate localized video content.
- Frontline workers train female farmers on agricultural, health and nutrition practices.

Market access services (LOOP)

- Digital Green provides aggregators (local entrepreneurs or farmers from the local community) with a market application that provides information and facilitates payment. Aggregators gather produce and arrange collective transportation and sales at higher prices.
- Aggregators return to the farmer the same day to confirm the sale and make the payment.

Enabling environment

Farmers and Digital Green and are impacted by several factors within their enabling environment. These factors are most important:

1. Labor

Labor is available but farmers tend to work their land themselves, hindering effective GAP implementation due to time constraints. Out-migration of males makes it tough for women to market their produce.

2. Trading system

Vulnerability of vegetables to timing logistics and the fact that vegetable markets tend to be less controlled with higher price fluctuation suits the LOOP system well.

3. Environmental (issues)

Farmers in Bihar face significant livelihood challenges, due to weather events and adverse climatic conditions. Floods and droughts are common in the state.

4. Infrastructure

In absence of proper storage facilities, post-harvest losses are incurred. Infrastructure is poor and hinders effective transportation as well as causing losses during transport.

5. Inputs & financing

Generally, the use of fertilizers is seldom adopted. Agricultural insurance, savings and new agricultural techniques follow the same trend.

6. Social (issues)

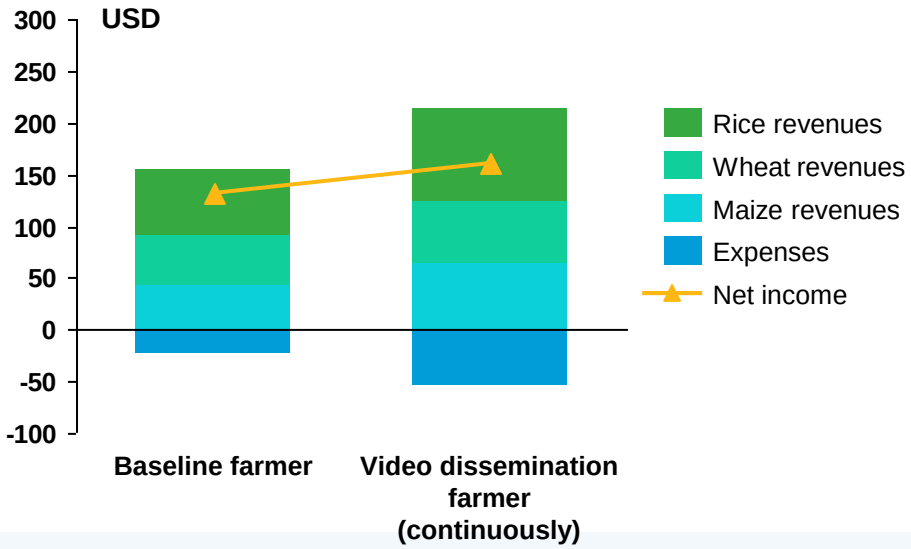
Adoption of new models is slow and influenced by several behavioral factors. Changes depend on individuals' resources, preferences, and constraints.

Overall SDM impact: Farmer P&L

Video extension

LOOP

The farm P&L shows the difference between a farmer that applies practices and the baseline in any given year. This is because a farmer in the SDM, who applies practices sees productivity impact immediately and without change over time.



Economic sustainability at farm level

Farmers in this SDM grow three main staple crops, which together can bring the farmer an annual income of up to USD160 when applying practices learned in video dissemination sessions. This compares favorably with a baseline net income of USD133. It should be noted that the P&L of an SDM farmer sketched here would only apply on the long-term in the extremely optimistic scenario of continued adoption: according to DG records and field data 50% of farmers apply practices in the year of training, but only 10% of those 50% would continue to adopt in subsequent years.

Between rotations of these main staple crops, which are predominantly grown for the farmers' own household consumption, farmers also grow vegetables for sale at local markets. These are the main source of cash income. Digital Green's own analysis of 2.5 years of LOOP data shows that farmers can earn on average USD115 a year from the sale of vegetables, which can rise by 15% if sold through the LOOP system.

Main revenue drivers

- **Productivity:** Farmers applying GAPs learned during video dissemination sessions can realize yields that are 22% to 50% higher than the average in the area.

Main cost drivers

- **Volume:** Production expenses have a linear relationship with production volumes. Thus, as a farmer's yield increases, so do his/her costs.

Overall SDM impact: Farmer P&L

Video extension

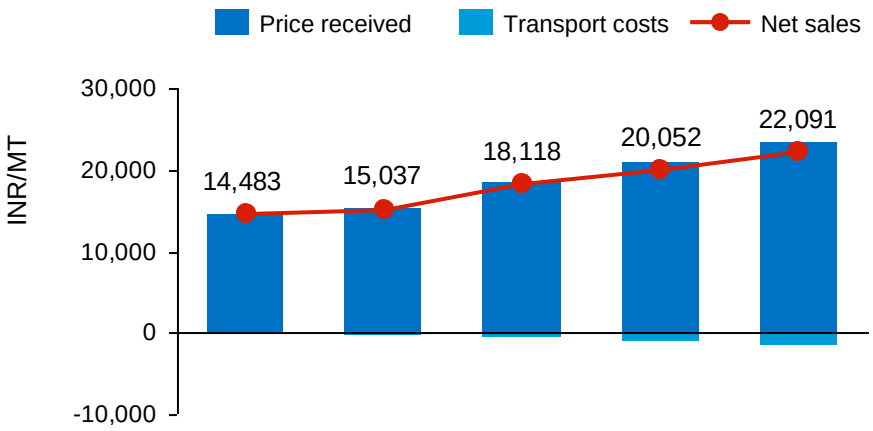
LOOP

The farmer business case for LOOP

- The analysis of LOOP sales data reveals that selling through LOOP results in higher farm level prices for produce compared to selling in the conventional way.
- *Farmer profit increases by 15%.*
- Part of the reason why farmers can earn higher prices for the same product is the access to more distant markets, as shown in the graphic and table on the right:
  - LOOP aggregators are able to identify where prices are highest through information shared via the internet.
  - When a large enough volume of the product is transported, the relative transport cost is reduced.
- Further analysis has shown that in addition to monetary profit, *farmers trading through LOOP can save 4-6 hours of travel time per day* as they no longer have to bring their crop to the market themselves.

Access to distant markets

Farmer direct sales revenues (price – transport costs) can be increased by selling to more distant markets

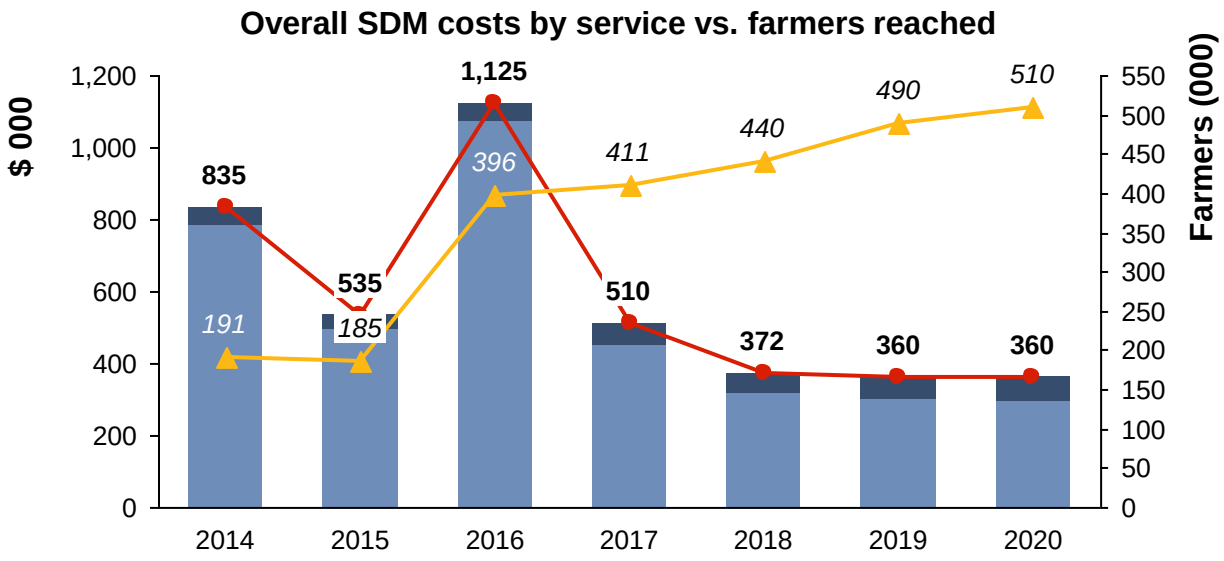


Distance	< 5 km	< 15 km	< 45 km	< 120 km	> 120 km
Markets in reach	1 - 2	1 - 2	4 - 5	6 - 8	10
Max price obtainable	60%	65%	79%	90%	100%
Transport	Lorry	Lorry	Mini truck	Truck	Large truck
Transport cost in INR/km/MT	20	20	13	11	10

SDM P&L – video dissemination

Video extension

LOOP



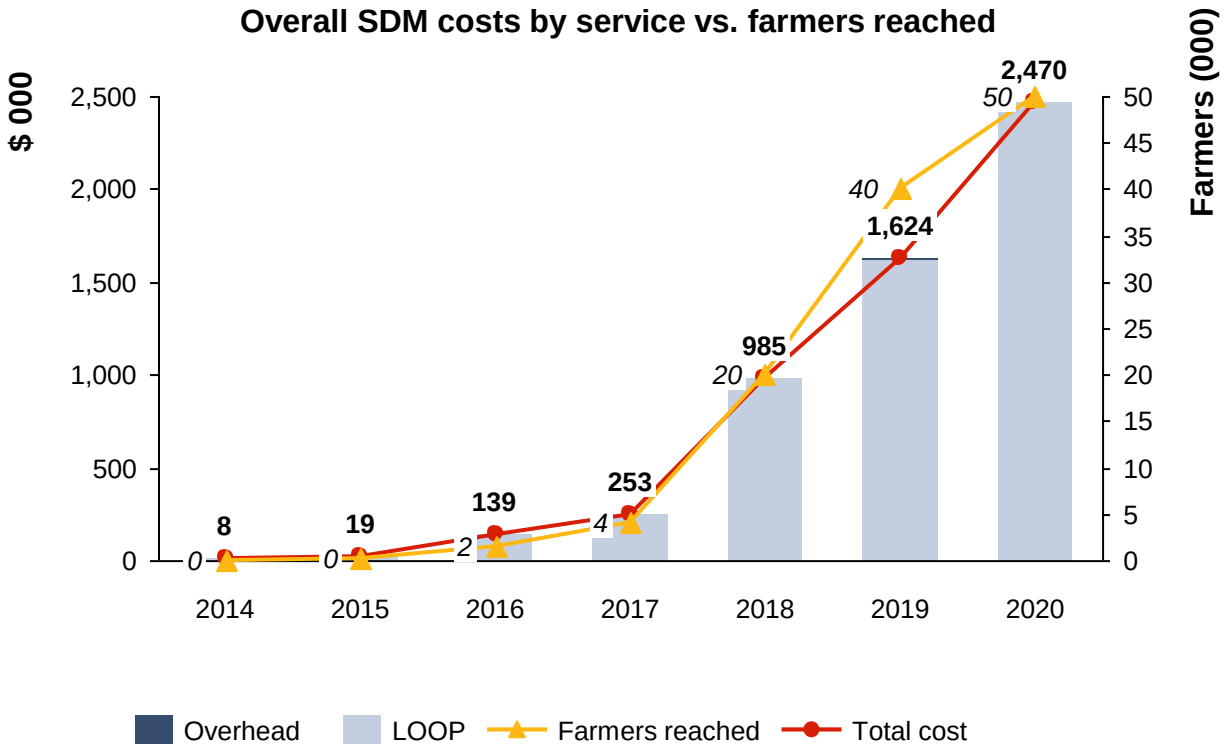
High costs of video dissemination program due to purchase cost of recording- / projection equipment

High costs of video dissemination program due to purchase cost of recording- / projection equipment as well as higher staff costs

Economic sustainability of the program and main cost drivers

- The cost of the video dissemination service declines over time, while overhead expenses remain constant.
- The irregular nature of the cost of video dissemination is due to the need to purchase costly projection and recording equipment at irregular time intervals.
- As the approach scales up, the government will gradually take on a larger portion of the expenses of this service.
- The graph presents those expenses in year of purchasing and assumes no major procurement is necessary up until 2020. It therefore does not show the fact that a large investment will likely be necessary in 2021.
- The video extension program aims to lower costs and attract sufficient funding. It does not aim to have the costs covered in any commercial way.

SDM P&L – LOOP



Economic sustainability of the program

- The cost of LOOP tracks the growth in farmers reached with this service.
- Variable costs, constituting the majority of costs, are directly linked to sales volumes and thus do not allow for significant economies of scale for this service.
- In the future, much of the costs of this program will be offloaded to its beneficiaries.

Main revenue drivers

- The variable costs of LOOP (aggregator fees and transport costs) are covered by farmer and trader contributions from 2019 onwards.

Main cost drivers

- The primary cost driver of the LOOP system is the scale of the program, specifically the volume of produce sold through LOOP, as this drives transportation costs and aggregator fees.
- Overhead costs *per farmer* decrease significantly over the course of the program; this includes for example the cost of technology infrastructure and program implementation and –coordination.

SDM projected outcomes

These results do not represent an official assessment of SDM success or failure by IDH or NewForesight. An indication is given based on the analysis done in this forward-looking study and assumptions provided by the SDM operator(s). Actual assessment should be done during and after the SDM, using measured data

The SDM aims to …	Projected outcomes
1 **Improve farm productivity through training on good agricultural practices**	• Farmers that apply practices can see yield increases of 27.5% compared to baseline. • However, low rates of *continuous* adoption hamper the overall impact of the model.
2 **Improve health and nutrition practices in farmers' villages and communities**	• This study focuses on an estimated impact of adoption of *agricultural* practices and leaves the wider social benefits largely out of account.
3 **Improve farmer access to market by providing transportation and price & payment services**	• At the time of publication, 5,000 farmers had traded vegetables through the LOOP system, achieving on average a 15% income increase c.f. baseline. • The service is on track to reach 30,000 farmers in 2018 and 100,000 in 2020.

Key insights

Key drivers of success

Video dissemination

- Integration into existing face-to-face training methodology allows for the best of both worlds: personal engagement combined with a standardized message.
- The fact that the people in the video are peers of the farmers creates credibility that they themselves can also use those practices.
- Integration into wider JEEViKA program set-up allowed DG to reach a large amount of farmers with a relatively low overhead. Attention to needs of and added value for JEEViKA, and patience in building this relationship created space for DG to structurally impact the JEEViKA program.

LOOP model

- The model is driven by a network effect: the wider the spread of the technology, the greater the geographical spread of markets and the level of market information. The greater the number of markets available/known the better farmers can balance the price for their crop against transportation costs.
- Over time farmers can aggregate greater volumes and obtain greater economies of scale in transportation, thus reaching further markets.
- Finally, greater volumes aggregated also allow farmers a stronger negotiation position with other market parties. At some point farmers may be able to “cut out” an increasing amount of middle-men.

Key risks

Video dissemination

- The practices that are taught through the dissemination may not continue to be adopted over time (this is not measured).
- It may also not be the case that the practices spread entirely through the household and remain only with the women that were educated. Men could perhaps be integrated into the training to ensure wider adoption.
- The impact of the practices taught is uncertain and the greatest focus may not lie on those practices that create the greatest impact.
- JEEViKA may at some point decide to radically change their model, without properly thinking through the implications for the video technology trainings.

LOOP model

- The program will stand or fall with mass participation. If a lot of people participate it’s a success. If not enough participants are garnered fast the program will fail.
- Trading practices are deeply entrenched into local communities, and may be hard to break. On top of that the gadidar plays a role in financing the farmers beyond the direct trades they engage in, providing access to finance in times of need. That practice effectively locks in farmers.
- Technological hiccups or botched trades would affect the model heavily in the early stages.

Key insights

Opportunities for improvement

Video dissemination

- The approach lends itself well to be translated into a revenue-generating model, whereby commercial parties would pay for the video dissemination methodology to be implemented in their supply chains.
- Digital Green and JEEViKA involved have done a very good job monitoring adoption, and could extend this approach to also monitoring impact. Then the actual impact on household livelihood could be assessed and the practices taught could be adjusted over time to maximize impact.
- Adoption over time could also be monitored. It is currently not clear to which extent the better practices are actually implemented over time (this study takes an optimistic approach on that).

LOOP model

- While only in its pilot stage, the model shows great potential. An interesting opportunity exists on the farm *input* side. Farmer demand could be aggregated, bought centrally and disbursed by the farmer through the same approach and supported by a technological platform that would largely be the same.
- Impact of Digital Green as a whole could be enhanced by tying the LOOP model to farmers trained through video extension (as is indeed planned in the future).

Key factors in replication

Video dissemination

- The key aspect of the Digital Green approach that needs to be replicated is the careful embedding of the methodology in the local enabling environment. The way DG has over the years won the trust by clearly working to support and strengthen the existing program approach has allowed them to build up the goodwill to come with a range of improvement to that approach over time.

LOOP model

- The model was able to build on the trust, the network and the brand name that Digital Green has build up in the geographical area where it has been active. Without that the technology by itself could not have the same effect.
- The technology used on the other hand should make for easy adoption into different environments, but would need to be adjusted to match the specific structure of local markets. It could also be tailored to meet the needs of existing farmer organizations and fulfill the same role of payment and marketing system.

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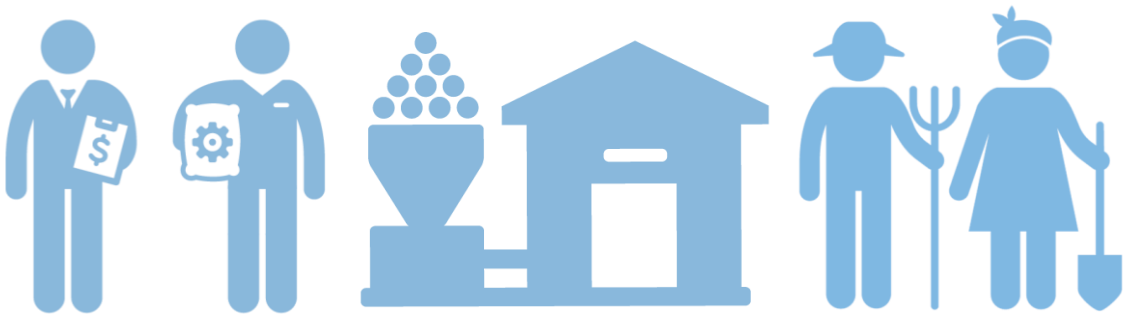

For more information, see the IDH Smallholder Engagement Report. This report, gathered by analyzing over 30 individual SDMs in 16 countries, provides insights into IDH's data-driven business analytics. The findings identify drivers of farmer resilience, cost reduction and financial sustainability in service models and the conditions needed for a supporting enabling environment.