

# DIGITAL LIBRARIES FOR THE POOR

## Facilitating Bottom-Up Innovation through Video-based Learning Platform

SOUTH ASIA LIVELIHOODS INNOVATIONS IN ICT SERIES

VOLUME 1 | NOTE 1

### Abstract

Community-driven programs in South Asia have traditionally used local facilitators to disseminate information and external best-practices. However, the massive scale of these programs has made this strategy both a time-consuming and an expensive exercise. Livelihoods Projects in Bihar, Andhra Pradesh, Jharkhand & Madhya Pradesh have piloted an innovative ICT based Rural Digital Libraries project in collaboration with Digital Green, a non-profit organization in India. Digital Green trains members of local communities about group facilitation, videography and basic video production. These videographers create digital content locally, highlighting both internal and external best practices. The videos are stored at the village level (and also uploaded on youtube) creating a local and online digital library and are disseminated widely through a network of village resource people using low-cost pico-projectors. These libraries are a decentralized, localized solution that combines the institutional platform with a digital knowledge platform to create multiple nodes of communication and learning in rural communities across the country. These localized solutions are created by face-to-face experiments by communities empowering them and improving the adoption rate of new technologies. Initial results have shown that this approach can triple the adoption rate compared to traditional extension systems at one-fifth the cost. With more than 150,000 small and marginal farmers in India participating at village-level video screenings, rural digital libraries offer a promising solution for faster and more accessible livelihood knowledge sharing and extension in geographically dispersed communities. Leveraging a video production and screening platform, community organizations have started to develop a localized, scalable model for agricultural extension, financial literacy, health and nutritional awareness and technology and livelihood training.



This series will share learnings from innovative usage of Information and Communication Technology (ICT) in rural livelihoods projects in South Asia. Several mobile-based and software related applications have removed information asymmetry, captured local and indigenous knowledge, improved feedback loops, built payment gateways, and created cost-effective digital content for the poor. These innovations have led to improvements in transaction efficiency, digitally empowered poor, enriched Management Information Systems (MIS), and built an efficient way of disseminating knowledge. Eventually, they have enabled localization of technologies and unleashed the inherent entrepreneurial ability of poor to achieve significant development outcomes.

#### Authors:

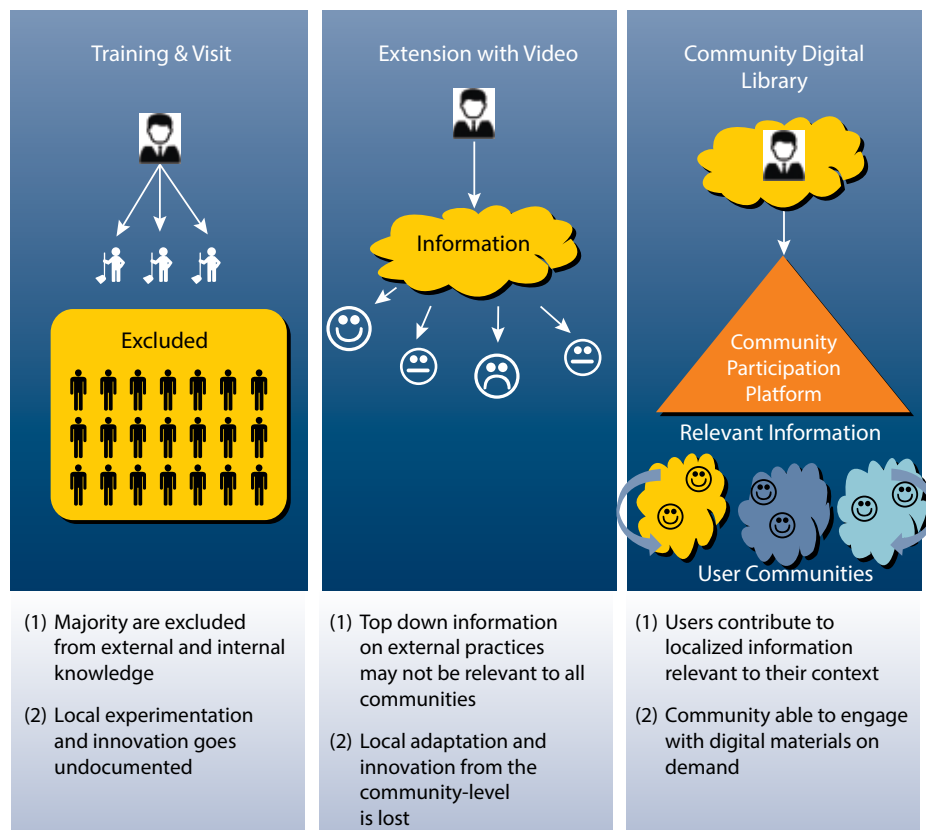
Abhishek Gupta, Parmesh Shah & Priya Surya

# Context

In spite of a high GDP growth over the past decade<sup>1</sup> over 350 million individuals in rural India live below the poverty line. Various community driven development programs<sup>2</sup> have been addressing issues related to rural poverty reduction and inclusive growth, through community-managed social and economic inclusion and livelihood promotion to the last-mile. Central to achieving these objectives is a powerful and transformative change in the role of the State from top-down provider of services, to a facilitator of community-led initiatives. Typically these projects mobilize poor women into self-help groups and federate these groups further at the village, sub-district, and district level. In addition, common livelihoods groups and producer groups are also mobilized on this institutional platform.

In agriculture for instance, traditionally knowledge has been provided through training-and-visit (T&V) programs that employs more than 100,000 extension workers throughout India but only 40% of households have access to modern farming technology<sup>3</sup>. But the sheer number of households per worker, accountability and monitoring concerns, and the

**FIGURE 1: PARTICIPATORY BOTTOM-UP KNOWLEDGE CREATION**



challenge of establishing rapport with small farmers has meant that they have largely worked with more affluent farmers that have the resources necessary for experimentation and change. Television, radio, and other mass media have also been used to address this problem, but have been largely

unsuccessful in creating systemic impact because information presented is often irrelevant or too general to be applied.

However, dissemination of relevant external best practices at the scale required to so many households, over long distances and often difficult terrain, is both a costly and time consuming proposition for *community resource persons*<sup>4</sup>, staff, and end users. Even with an effective demand-driven extension program brings in powerful external best practices, much of the local adaptation, experimentation, and innovation created *in situ* remains with individual farmers without the tools to document and disseminate innovation created at the grassroots.



<sup>1</sup> 7.3 percent average growth between 2001 and 2010

<sup>2</sup> (Bank 2009)

<sup>3</sup> (Mittal 2012)

<sup>4</sup> *Community resource persons (CRPs)* – selected members of the community who take on leadership positions on implementing major initiatives



# Meeting the Knowledge Gap through Video

Recognizing the promise and proven impact of a video-based platform to the documentation and dissemination of localized knowledge, several community-driven livelihoods project have partnered with Digital Green, a social enterprise that has pioneered in providing agricultural extension through a peer-to-peer video-based knowledge platform. Several World Bank supported projects such as Indira Kranthi Pratham<sup>5</sup> in Andhra Pradesh and Jeevika<sup>6</sup> in Bihar have already started operations and enlisted and trained mediators at the village-level. The Digital Library project builds on this partnership to create an end-to-end knowledge management

solution at the village level, that can be used on-demand to create, share, and disseminate highly relevant information.

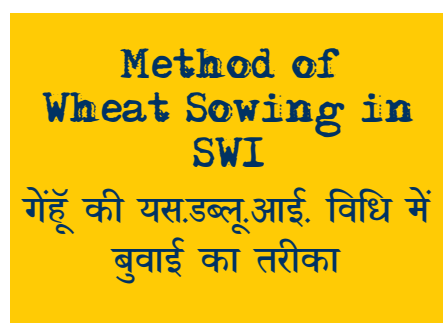
Small content creation teams, working with a portable battery-powered camcorder create digital content locally, highlighting both internal and external best practices in various thematic priorities. These short videos are then disseminated widely through a network of village entrepreneurs. Each community entrepreneur, typically a self-help group<sup>7</sup> member from the community stores a digital library of video and other media at the village level. Her main role is to obtain (through direct download by

mobile device or via USB drive) and store a digital library of knowledge, and coordinate screenings with SHGs, livelihood cooperatives, and village organization on timely and relevant topics. Using a portable, battery-powered projector, screenings take place at common buildings, where short videos are displayed with trained mediators, followed by a Q&A regarding the demonstrated practice. Video content consists of technical demonstrations, discussions, or success stories of best practices in topics relevant to participating groups.

Till now, Digital Green has scaled to 2,400 villages in South Asia and Africa<sup>8</sup>. In addition to agricultural extension, Digital Green will utilize video-based training across multiple types of interventions under these projects such as, financial inclusion, social mobilization, public health, nutrition, as well as livestock and dairy production. This unique partnership has the potential to make community mobilization and service delivery even more cost-effective by connecting the Digital Green platform with community-driven rural development approaches that are already using technical trainers, extension staff, and community intermediaries.

The Digital Library project is managed primarily by community institutions—Self-Help groups and their federations, with capacity building and support from the project staff of IKP and

**FIGURE 2: SCREEN SHOTS OF A SOWING DEMONSTRATION VIDEO BY LOCAL FARMERS**



Seed Treatment before sowing



Maintaining Proper Distance while Sowing



Sowing of seeds



Covering the seeds with soil after sowing

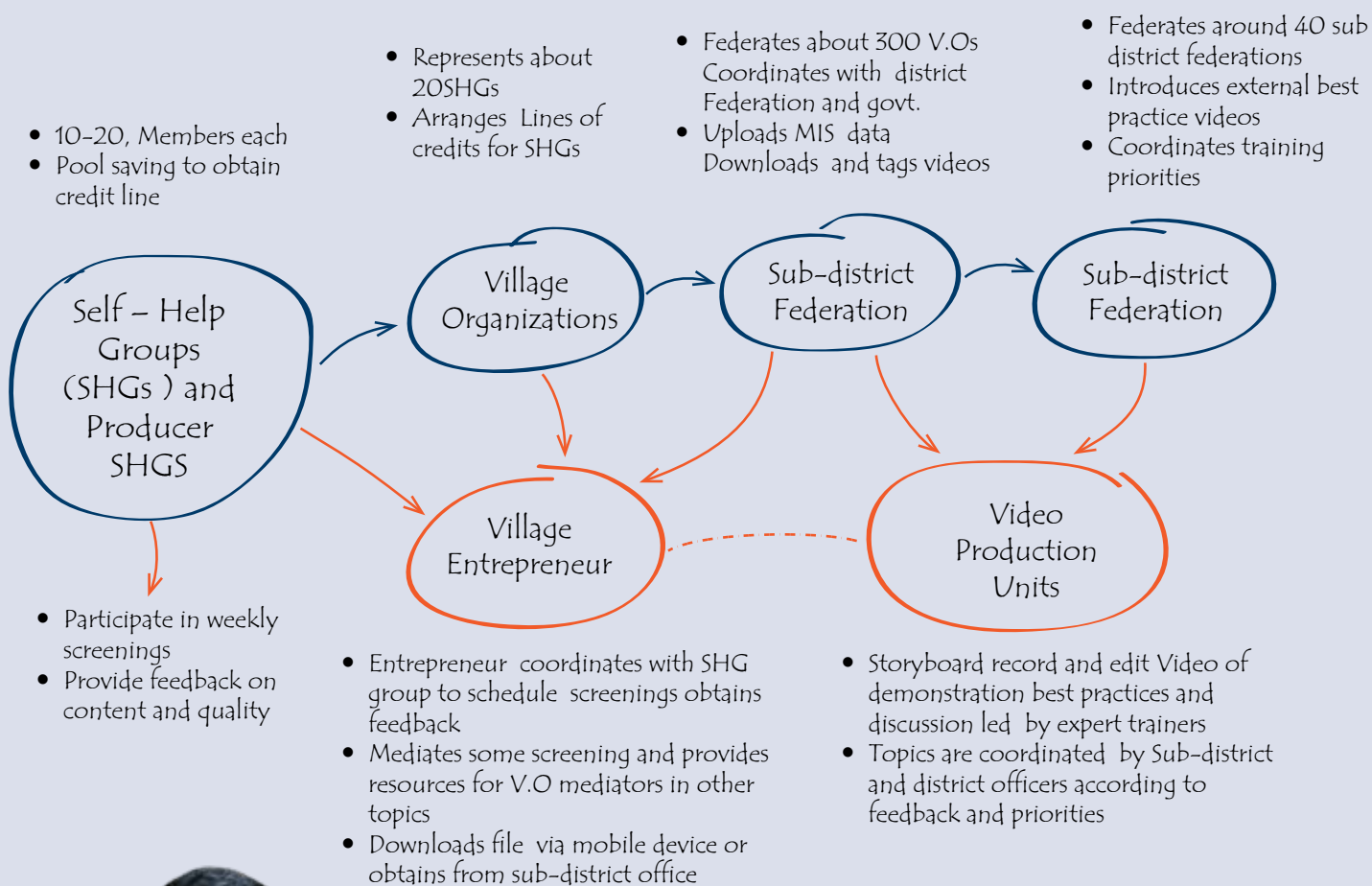
<sup>5</sup> visit <http://www.serp.ap.gov.in/> for more details

<sup>6</sup> visit <http://brlp.in/> for more details

<sup>7</sup> A typical self-help group comprises 10-15 women from the poorest of the poor and the poor. The members meet at least once a week, collect savings and maintain books of accounts. Representatives from several groups are further federated into village organizations.

<sup>8</sup> Currently the organization is funded by a 3-year grant from the Bill & Melinda Gates Foundation. In addition to the Gates Foundation funding, the World Bank and Government partners have contributed to the cost of CRPs, equipment for the project and training costs.

**FIGURE 3: LEVERAGING THE COMMUNITY INSTITUTIONAL PLATFORM**



Jeevika and Digital Green provides technological and implementation support. Figure 3 explains how community institutions are leveraged to scale-up this technology.

**Leveraging existing institutional knowledge and capacity.** The Digital Library project draws on existing community federations to provide end-to-end support to both the creation and dissemination of relevant knowledge through digital media. The Table below provides a snapshot of the key achievement in the World Bank supported projects.

For capturing local innovations and best practices, individual farmers and village organizations can inform their digital librarians to showcase their innovation and results in a digital video. For the provision of external best practices, district and sub-district



federations provide domain experts such as agronomists, veterinarians, technology trainers, vocational teachers, and others. A locally trained video production unit storyboards and record videos with the use of a basic camcorder and an external

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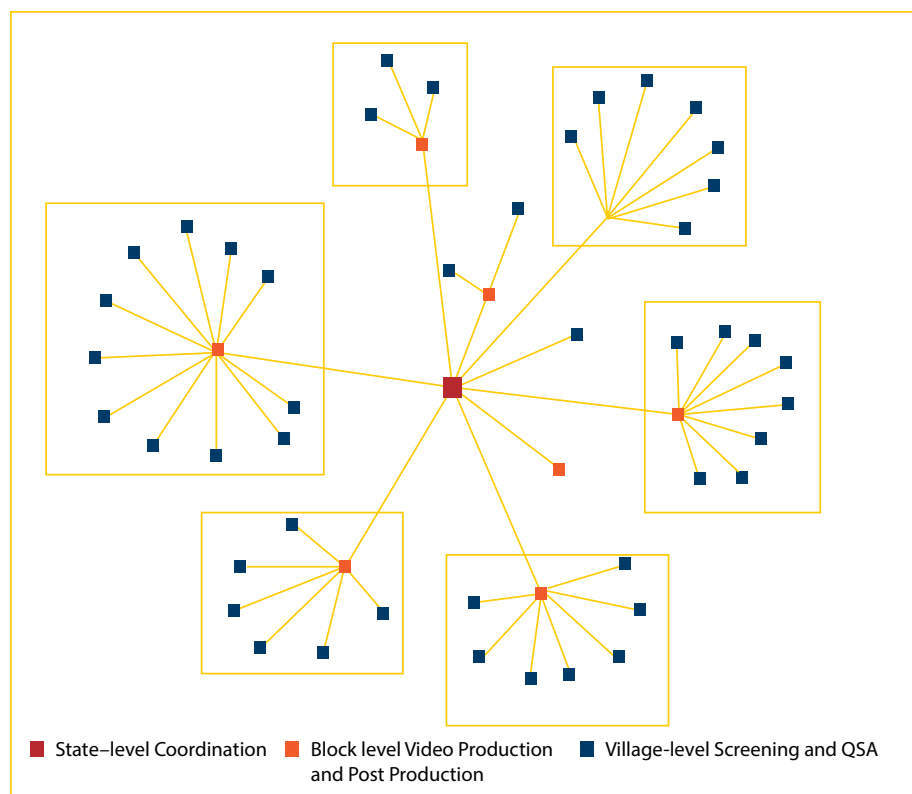
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99

microphone. After production, content is edited and streamlined for screening. The video is then uploaded on to Connect Online-Connect Offline (COCO) platform from where it can be downloaded via mobiles or handheld devices or manually transferred via USB drives from sub-district offices, which have more reliable connectivity.

At the dissemination end, the village resource person coordinates with producer groups, SHGs, and village organizations to obtain and screen videos relevant to the season.

**FIGURE 4: HUB AND SPOKE MODEL OF IMPLEMENTATION**



**Hub-and-spoke model enables operations to scale easily.** When entering into a new district, 3-6 video content producers from the community organization with aptitude and interest are selected by village and sub-district federations and trained by Digital Green to lead content production. Videos may feature various topics within each thematic category. For instance, in agricultural extension, topics may vary from production of organic inputs to grain storage, according to the season, and the needs and variations of the local community. Videos are produced throughout the district with various farmers and experts but are then

edited and finalized at a center, such as the district or block office. See Figure 4 for a schematic on the hub-and-spoke model.

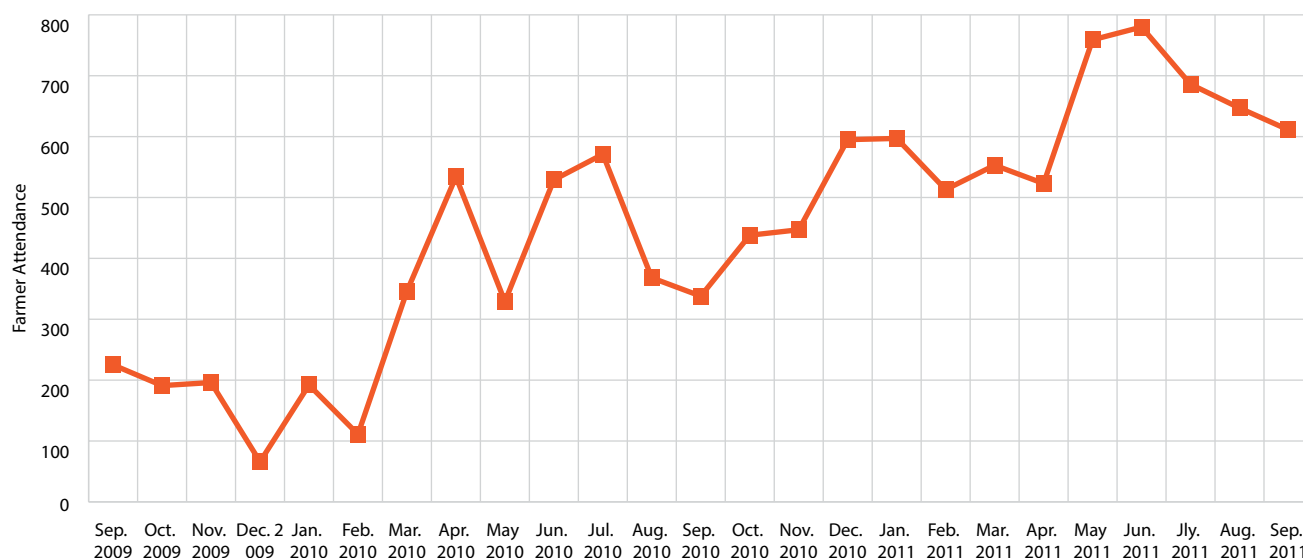
**Selection of Digital Librarians.** Village mediators are typically selected based on communication abilities, interest and ability to engage across divisions in their community, and local language literacy. Mostly these are women members of SHGs and are equipped with portable projectors that conduct a minimum of three screenings per week with various producer groups. The initial training for the mediator takes about 3-4 days and is primarily focused on building communication skills—such as public speaking, asking and answering questions, capturing audience interest, following up with community members after video screenings, and operating the equipment. Follow-up training each quarter is used to observe how mediators are developing their skills and to provide additional support. In some projects, a performance-based honorarium is provided based on mutually agreed set of target metrics in return for mediation

**TABLE 1: KEY STATISTICS FOR WORLD BANK SUPPORTED PROJECTS <sup>9</sup>**

State	Viewers	Villages	Videos Produced
Andhra Pradesh	43355	413	72
Bihar	74673	621	211
Jharkhand	72	1	1
Madhya Pradesh	2212	46	9
<b>India</b>	<b>120312</b>	<b>1081</b>	<b>293</b>

<sup>9</sup> (Green, Connect Online-Connect Offline (COCO) n.d.)

**FIGURE 5: ATTENDANCE FOR 13 VILLAGES IN JHARKHAND THAT BEGAN IN SEPTEMBER 2009**



services. Trained community resource persons and staff with agricultural or livelihood expertise at the block level shall conduct monthly or biweekly meetings with the mediators in their geography to review progress, analyze community feedback, plan for the next screening (e.g., anticipating the questions the community might ask).

**Meeting energy challenges with rechargeable and solar equipment.** Inconsistent power supply in rural areas is overcome by using

rechargeable battery-operated video equipment and portable lithium-ion battery-powered projectors. Extra batteries are kept with each device to provide for sufficient use before it needs to be recharged. Recharging options in off-grid villages include transporting the device to a nearby village or town that is connected to the grid or solar panels on a weekly basis.

Once edited, metadata for the video (for example: title, practice, seasonality, geography) is uploaded onto the COCO platform. The digital video file is then copied onto multiple memory cards, which are given to village mediators at biweekly/monthly review meetings. The video files are then uploaded onto YouTube and then linked with Digital Green's global video library<sup>10</sup>. Thus far, more than 2,600 videos of 8-10 minutes each have been created. The global digital library is also organized into various thematic categories and project partners<sup>11</sup>. This highly interactive library can be accessed

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### COCO: OVERCOMING CONNECTIVITY CHALLENGES IN RURAL AREAS

In areas with poor net connectivity, uploading extensive survey data or media-rich videos can be a debilitating challenge at the field level.

The Connect Online Connect Offline open source platform created by Digital Green enables users to use the application continuously, and only requires connectivity when a user is ready to synchronize with the global data repository.

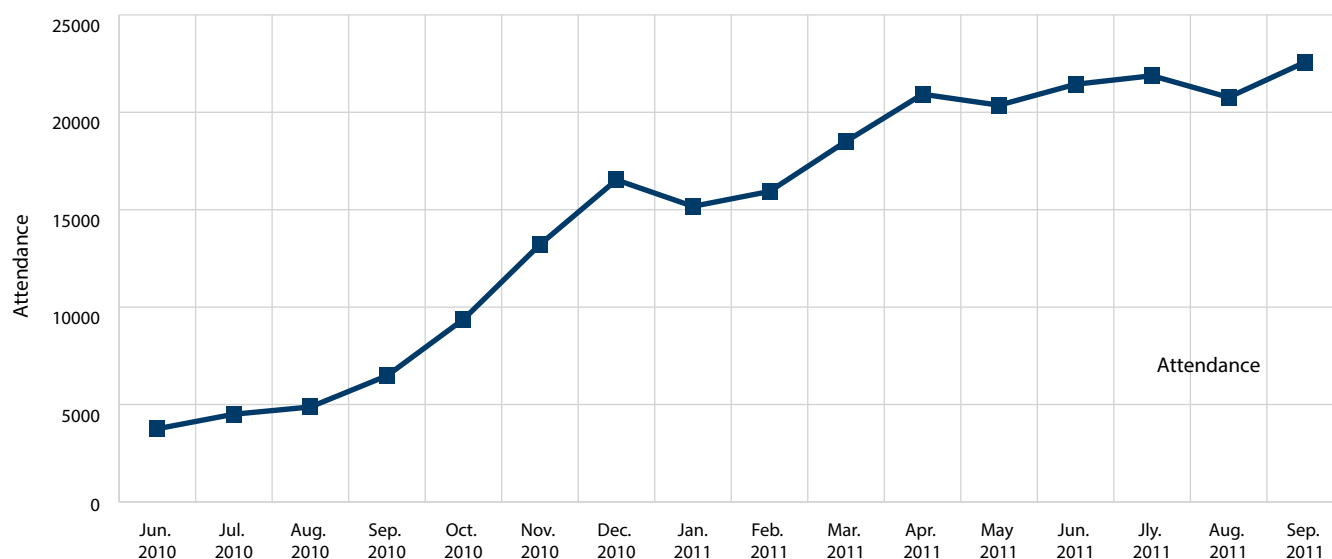
This customizable framework can be used to upload baseline survey data, photos and videos from the field, without the need of IT/Engineering staff. Free download available at [www.digitalgreen.org/tech](http://www.digitalgreen.org/tech)

A second layer of analytics function then enables easy analysis and tagging of uploaded information. For more information, please visit [http://www.digitalgreen.org/analytics/overview\\_module?geog=country&id=1](http://www.digitalgreen.org/analytics/overview_module?geog=country&id=1)

<sup>10</sup> (Green, Digital Green's Global video library n.d.)

<sup>11</sup> The website also has an activity feed of various partners giving a snap-shot of activity related to that community.

**FIGURE 6: FARMER ATTENDANCE AT 64 VILLAGE CENTERS IN MADHYA PRADESH<sup>12</sup>**



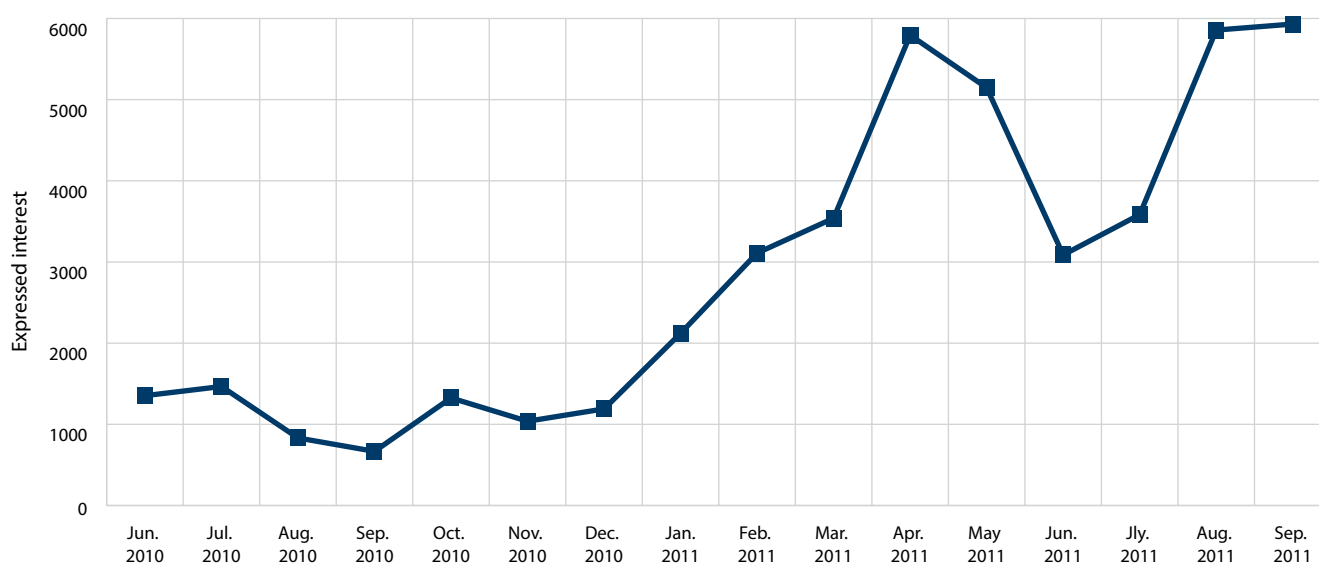
by anybody with an internet connection<sup>13</sup>.

**Sequencing implementation to build interest.** In order to gain acceptance from farmers, the service is showcased in an initial village gathering, and interested farmers are invited to record new content with community resource persons trained in audio and video recording. After post-production edits are completed at the block level, informal screenings focus on multiple peer groups, who in turn bring in greater community participation (See Figure 5).

Self-Help Groups and producer cooperatives regularly take part in both content creation and screenings in groups. By specifically targeting existing and reinforcing existing social networks, Digital Green has seen increased adoption rates among farmer groups, rather than working with unassociated individuals. Seasonality is a factor for relevance of content, but as seen in Figure 6 and Figure 7, interest and attendance among farmers tends to vary throughout the year, not necessarily according to season.

**Mediating video screenings allow for discussion and learning.** Individual groups attend the mediated video screenings at a specified time and place each week. Mediators also record details of attendance, questions asked, interests expressed, and the practices that farmers adopt for themselves on their fields. This data is recorded initially on paper forms by the mediator and then digitized on the connect-online-connect-offline (COCO) platform.

**FIGURE 7: EXPRESSED INTEREST IN THE PROGRAM IN MADHYA PRADESH**



<sup>12</sup> Based on Digital Greens Internal Data from 487 villages in Madhya Pradesh.

<sup>13</sup> These videos are about to reach almost 1 million views.

# Cost Effectiveness and Impact

Different organizations have partnered with Digital Green and have used community mediators to substitute for existing extension trainings and farmer field schools to reach more people. PRADAN, a national NGO focused on community mobilization and livelihood promotion, has experienced significant cost savings by substituting part-time mediators and video programming through Digital Green for field visits made by professional extension officers. In contrast, VARRAT, a local NGO is using the video platform as a supplementary service, so the additional costs are added to their existing costs. However, despite the higher-cost model that VARRAT has adopted, **both methods have experienced similar impact in terms of farmer adoption of new methods** (data gathered by mediators, with 20-30% externally audited).

**TABLE 2: COST SAVINGS AND ADOPTION RATES IN 2 NGO PARTNER PROGRAMS (2012)**

Extension System	Cost	Adoption <sup>15</sup> (%)	Cost/Adoption
PRADAN	\$605	16%	\$10.24
PRADAN+ Digital Green	\$288	49%	\$2.51
VARRAT	\$636	20%	\$17.64
VARRAT+ Digital Green	\$712	48%	\$3.56

*Note: Cost and adoption rates are shown on a per village per year basis*  
*The main cost component in these calculations is the amortized per village cost of the partner organization's full-time professional extension officers. The projectors, which are now used ubiquitously throughout the project, cost about US\$175 per unit. These compact, mobile-devices with rechargeable batteries have now replaced the more expensive and cumbersome TV/DVD systems in all recent villages.*

Adoption rates are almost 50 percent under the Digital Greens method, much higher than the traditional method. (see Table 2 above).<sup>14</sup>

**Depending on the mode of engagement, NGOs have seen significant cost savings.** Table 2 shows that the cost per village per

year of providing extension services to villages varies, but is consistently lower in terms of cost/adoption. The cost per village per year varies significantly between the two NGOs studied because of differences in the way each partner integrates a video platform within their existing extension system.

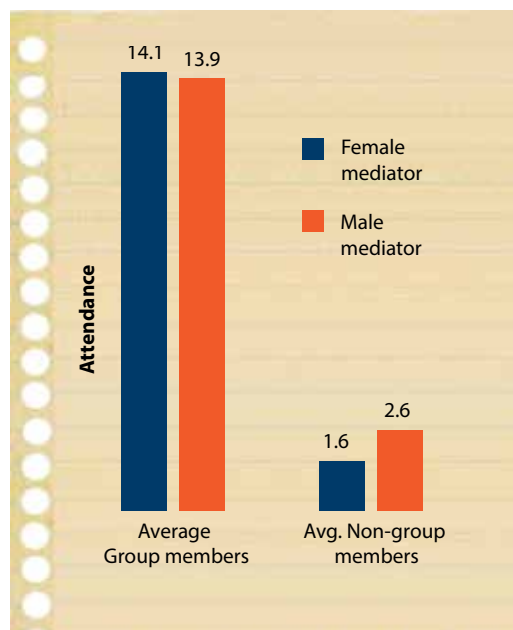


<sup>14</sup> Digital Green plans to conduct a more rigorous randomized control trial in Bihar in 2014 to evaluate how changes in particular program design affects adoption and changes in income going forward.

<sup>15</sup> Adoption rates defined here is the ratio of the no of practices adopted by farmers and no of practices demonstrated to them. These are not unique viewers adopting any practice.



**FIGURE 8: PARTICIPATION UNDER FEMALE MEDIATORS IS HIGHER FOR GROUPS AND INDIVIDUALS**



**Adoption rates are high compared to alternate extension methods.** Based on a 13-month trial conducted in Karnataka, Digital Green observed that its approach increased the adoption of certain agriculture practices seven-fold over a classic Training and Visit-based (T&V) extension approach<sup>16</sup>. It has shown to be ten times more effective per dollar spent than a classical extension system<sup>17</sup>.

**Women's participation is high.** Majority of participants (71%)<sup>18</sup> that attend screenings are women and typically belong to groups. Depending on partner organizations, participation can range from all men groups, to more than 90% female participation. The SHGs have a role in selecting the mediator in their village. But overall participation of groups and non-group individuals seems to be higher under female mediators. The graph on the

left represents the most recent summer season data from all Digital Green-assisted project sites, when participation is usually highest. Though there were only 110 female mediators compared to 272 male mediators during the months of June through August 2011, female mediators drew consistently greater number of group and non-group members to their screenings.

**Local entrepreneurs gain marketable skills and self-confidence.** The mediators are a diverse group: gender, age, socioeconomic background, and agricultural expertise. But overall, Digital Green mediators develop both their communication as well as technical abilities through the process of facilitating the screening of the videos. They often become early adopters of the practices that they show to prove its viability for themselves and to work through possible issues. They gain the technical knowledge of how to operate the Pico projectors and develop their communication abilities more broadly. The mediators also develop self-confidence through the process of becoming resource persons

in their community for knowledge on improved practices. Several mediators have become local leaders.

The video producers are typically selected based on their experience in working with partner organizations in the past—usually as a community intermediary for their existing interventions. They gain technical knowledge of operating camera equipment, transforming often-complex agricultural information into video-based modules, developing communication and facilitation



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<sup>16</sup> The trial had eight control and eight experimental villages balanced on parameters such as size and mix of crops, and a total of 1,470 households were tracked. Results can be found in Gandhi et al. (2009). These are preliminary results and a rigorous randomized trial is underway.

<sup>17</sup> Investments included performance-based honoraria for local facilitators, a shared TV and DVD player in each village, and one digital camcorder and PC shared across the project area.

<sup>18</sup> This is the average for Digital Greens. As NRLM facilitates women-only institutions, women participation for NRLM is almost 100 percent

skills. The video producers often continue in their role in the other types of activities (e.g., farmer field schools, demonstration plots) that may be conducted by community organizations.

### **Obtaining and integrating feedback.**

While scaling ambitiously, the Digital Library project must focus on assuring



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both process and content quality. To maintain process quality, standard operating procedures are being developed for various aspects of the process, such as video production, dissemination, and is enhancing the training of trainers' capacity with a dedicated core team that will capture learning and share best practices across locations. With regard to content quality, continuous end user feedback needs to be integrated in observed metrics to monitor quality of the content that is produced and evaluate the impact that it makes. The use of mobile devices can also



improve feedback capture if videos are rated at the village-level immediately after screening. Some randomized mechanisms can also be used where particular members of the audience marked as present during a screening can be asked for their feedback via their own mobile phones.

**Impact may vary for different applications.** For community-driven projects, a video-based learning platform presents a wide range of application possibilities including community mobilization and self-help group formation and training,

financial literacy, technology training and creating health awareness among others. While video screenings has shown high rates of success for technical demonstration of agricultural practices, rate of success may vary for applications such as financial literacy which may be more conceptual than technical and where the level of familiarity with the context may vary. Particular applications should be tested independently to establish for which applications digital video can complement a conventional approach, and where it can be substituted.





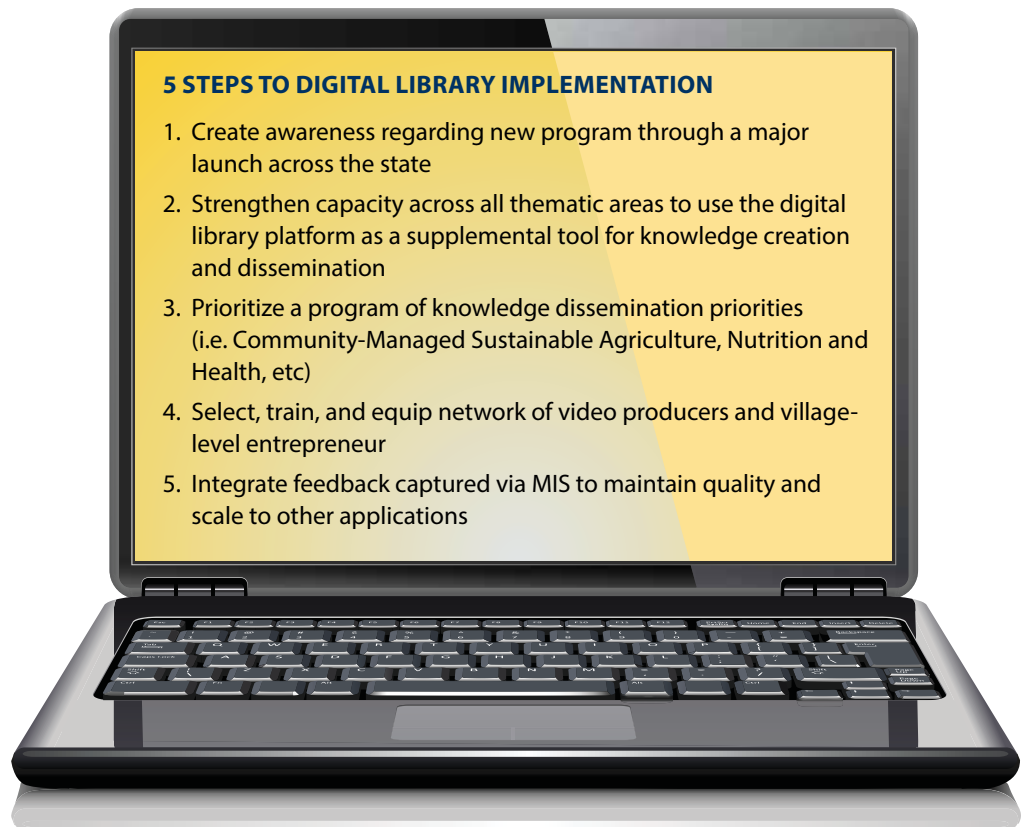
# Digital Knowledge 2.0 for the Rural Poor

By enabling users to create and access a large store of relevant information, an accessible digital platform can have powerful implications for rural communities.

**Highlight and promote bottom-up innovation.** Localized video production teams work with village and sub-district federations to identify homegrown innovators, success stories, best practices that can be documented and circulated within those communities. Furthermore, video challenges and competitions judging best videos in terms of content and quality, and partnerships with local channels to air these videos can provide further incentives for participation.

**Mobile capabilities expand access and interaction opportunities.** As connectivity becomes commonplace, files may be downloaded remotely and via data-enabled cell phones and other mobile devices. Given that rural monitoring and support programs are now beginning to widely employ data-based functions over mobiles, states like Andhra Pradesh could be ready for remotely connected digital libraries.

**Individual farmer level feedback.** Quality and relevance of content, as well as adoption rates can also be obtained directly from participants equipped with mobile phones.



This granular information from the individual level extending across entire states can provide a broader and more accurate picture of content relevance and impact than feedback data collected manually by mediators, which may be limited and prone to errors.

**Digital librarian and CRPs have a shelf of relevant videos they can draw from on-demand.** The affordability of the digital format allows community

professionals and staff to maintain a large library of information to use as needed. This decentralized structure means that videos, documents, photos, and other media can be transferred easily, lowering costs of copying and distributing content.

**Rural libraries can complement existing livelihood activities.** By reducing the cost and increasing the speed in the delivery of information, community resource persons and field assistants can use this knowledge tool to complement face to face training to build awareness, training, and capacity within communities.

**Create new livelihood opportunities for people on the ground.** As SHG women and youth become involved in creating, maintaining and disseminating digital content, viable and sustainable sources of income are created for entrepreneurial citizens of the community. Their communication skills and self-confidence are also improved through the practice of mediating discussions and trainings





# Challenges

The Digital Green's technological approach has not yet been fully integrated into the public sector's extension systems. Currently, it has limited associations with the wider agricultural community and efforts need to be made to embed this approach deeper into the government's agriculture systems.

The vast amount of data being generated from the communities has not yet integrated well with the decision support system of the projects, and the knowledge from this data needs to be utilized better.

The costs of operations are currently funded by grants, and a sustainable business model has not been explored. In the future, the organization should consider devising innovative revenue models such as user-fees etc.

The hardware being used by Digital Greens can be further upgraded and the number of gadgets being operated by the communities can be reduced. For instance, adoption of latest mobile technology can integrate peco projector and camera into a single device.

Digital Green's communications technology can also be applied to other sectors and the organization has already taken initial steps towards it by making nutrition videos. However, the vertical expansion should strive to convert the local facilitator into a one-stop shop of knowledge provider for that village, which will be a challenging task.

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### ABOUT THE AUTHORS

*Abhishek Gupta is a Consultant with the World Bank*

*Parmesh Shah is a Lead Rural Development Specialist in South Asia Sustainable Development at the World Bank.*

*Priya Surya was a Consultant with the World Bank*

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*Photo Courtesy: Digital Green*

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**For further details or additional copies of this note contact [agupta20@worldbank.org](mailto:agupta20@worldbank.org)**

