

Case Study

Digital Green

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EXECUTIVE SUMMARY

Agricultural extension has long been a major concern of agricultural policies in India. In keeping with the same, numerous agricultural extension programmes have been implemented by the government. These efforts have been supported by many NGOs working in different parts of the country. However, most of the agricultural problems suffer from largely similar problems. Huge number of staff is required to support them and extension officers usually restrict their interactions to the richer, more enterprising farmers within a village. The smaller and marginalised farmers move further to the periphery of agricultural progress.

In this context, started in 2009, Digital Green seeks to build on existing agricultural extension programmes by combining social organization and technology. The Digital Green approach involves the use of videos for disseminating information about agricultural techniques that farmers can easily adopt in order to increase their productivity.

The use of video for information dissemination is not new but Digital Green's approach is set apart by its unique strengths. The main components of this approach are (a) a participatory process for local video production, (b) a human-mediated instruction model for dissemination and training, (c) a hardware and software technology platform for exchanging data in areas with limited Internet and electrical grid connectivity, and (d) an iterative model to progressively better address the needs and interests of the community with analytical tools and interactive phone-based feedback channels.

Digital Green partners with local organizations that have been working in related fields and already have substantial rapport with the farmer community. Digital Green currently operates in 5 states in India- Madhya Pradesh, Karnataka, Jharkhand, Bihar and Orissa. Till date, 1624 videos have been produced, 33193 screenings conducted and 56135 farmers have been reached. The overall agricultural practice adoption rate is 31.43%.

BACKGROUND

Indian agriculture currently faces the twin challenges of meeting the rising food demand of an increasing population in a sustainable manner and making the best use of the available resources and technology for enhancing the production and productivity of the agricultural sector.¹ The very nature of Indian agriculture has been on a change- increasing resource (land

¹ Foreword, Agricultural Statistics at a Glance 2010, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India

and water, mainly) degradation, changes in demand and consumption pattern, changing farming systems with a focus on horticultural crops etc, declining public investments in agriculture, liberalization of agricultural trade and such like. Farmers require a different type of support (training, problem-solving consultancy, marketing advice etc) to deal with these changes in agricultural practices. At the same time, there is ample evidence in India to suggest that increasing debts and declining returns have led some farmers to make desperate choices including selling their land below market rates and even suicide. A major problem lies in the dearth of adequate knowledge about farming itself, which leads to poor decision-making.

A popular method used for reducing this knowledge gap is agricultural extension wherein extension agents impart farming practices and techniques to farmers through individual interaction. Today, agricultural extension remains the focus of many government programmes; India has the second largest number of extension workers in the world- more than 100,000.²

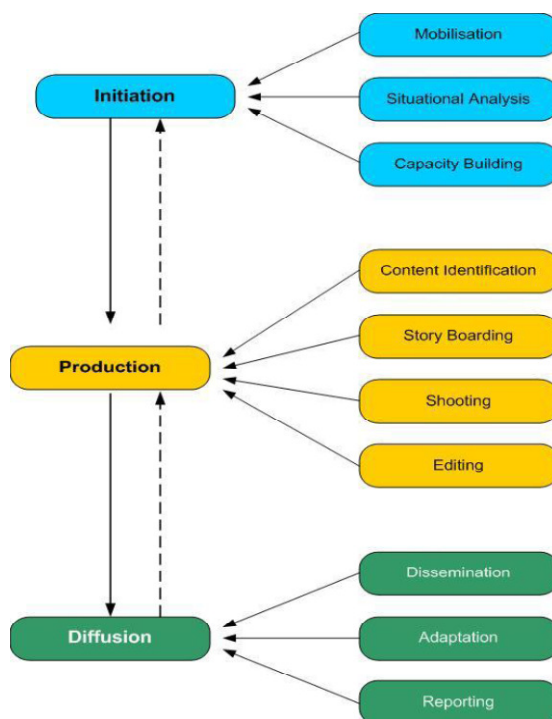


Figure 1: Work flow of Digital Green system

Courtesy: Digital Green

² Gandhi, Veeraraghavan, Toyama and Ramprasad, 'Digital Green: Participatory Video and Mediated Instruction for Agricultural Extension', Vol.5, Number 1, Spring 2009, 1-15, Annenberg School for Communication, 2009

The DG work cycle is divided into three broad stages- (i) initiation, (ii) production, and (iii) diffusion. Each of these stages is sub-divided into 3 or 4 sub-stages. The DG Standard Operating Procedures, which include details on how each of these stages should ensue, ensure uniformity in programme implementation across villages.

Under initiation, the first step is the mobilization of village farmers wherein conceptual and operational aspects of the DG approach are discussed with village leaders and community groups like Self Help Groups working in the village. A situational analysis of the villages is then done by selecting villages on a random basis, surveying them, and preparing their profiles based on few socio-economic parameters. This is followed by capacity building efforts for which a team is selected from among the local community members and intensively trained for video shooting, editing and diffusion in the community.

This is followed by the production phase. To start with, content identification takes place to select topics for filming agricultural practices on. Content includes local subject matter topics useful in improving farming practices. The parameters for deciding on the content of the videos include seasonal and geographic relevance of the practice; feedback collected from farmers at the time of video screening is often taken into account for the same. Thorough research is conducted to formulate a cost-benefit analysis that assures the sustainability of promoted agricultural methods given local conditions. Thereafter, corresponding knowledge is shared and discussed before storyboarding takes place to describe the way the content will be shot. The storyboard is created, checked for correctness and then used for shooting in the local community. The recordings in the DG database are made by teachers of agriculture at the grassroots level- scientists from government institutions, NGO experts, field staff, progressive farmers, and other enthusiastic volunteers from inside and outside the local community. Demonstration of a particular agricultural technique follows a definite structure in order to maintain uniformity across videos and yet give them a local colour. The structure is as follows: a brief verbal overview of the entire process, an itemization of the required resources and associated costs, step-by-step instructions in the field, a showcase of the uses and benefits, and interactions with farmers to address common questions and concerns.

This is followed by editing of the raw video clips that are stitched together in a final video. The final video is checked for accuracy, clarity and completeness of content by technical and

subject-matter specialists. Once the video has been created, it is added to the video-centric content repository maintained on the DG website. Anybody with an internet connection can, therefore, access the videos. The video based approach has certain important advantages. Owing to the low literacy levels among farmers, traditional forms of agricultural content that use expert terminology are often irrelevant for them. Farmers rely extensively on their visual and auditory senses and are, therefore, more receptive to adopt new practices through demonstrative exhibition. Videos created using the DG approach are recorded in local languages, making it easier for the farmers to understand them on their own. Local farmers, individually or in groups, often act in the videos- this makes it easier for farmers to identify the practice as authentic, reliable and replicable in their context.

In the diffusion stage, dissemination of videos takes place by organizing an event in which a mediator from the community shares locally produced video through organizations- Self Help Groups and village development committees- using Pico projectors and TVs. Dissemination of videos starts with shipping of DVDs to a village. The TV and DVD player or Pico projector used for the purpose are circulated around different areas of the village- bus stands, temples, schoolhouses, panchayat offices, streets etc- since villages usually do not have a single public place where farmers regularly gather. Screenings usually take place between 7 and 9 pm and involve small groups of 10 to 20 farmers. Multiple screenings are scheduled each week on a rotational basis.



Figure 2: Video screening using Pico projector
Courtesy: Digital Green

Extension staff monitors the dynamics of an audience, sometimes by directly posing questions, to maintain a farmer's engagement. Extension workers use the programming as a tool to disseminate content to a larger audience while maintaining personalized support. That is, extension workers will typically reiterate concepts between each clipping, pose questions to gauge interest, and announce follow-up visits and subsequent screenings. Extension workers encourage farmers to attempt processes on their own, and announce their availability to individually visit farmer plots as required. Extension workers sometimes provide farmers with

the required ingredients or tools during the screenings of certain processes. Community service persons obtain feedback from the group of viewers.

Technology

CONNECT ONLINE, CONNECT OFFLINE (COCO)

The information collected is fed through the reporting system- Connect Online, Connect Offline (COCO) - where it can be shared and tracked by DG, its partners and the public. COCO is Digital Green's in-house innovation, inspired by the need to alleviate technical issues in gathering and storing information at the field level. COCO provides a highly flexible and robust software system to make information gathering and input at Digital Green less error prone, fast and resilient to persistent data connectivity issues in remote locations. COCO's singular unique selling proposition is the ability to take the application offline in low and limited bandwidth locations, with uninterrupted usage in the browser. The system is designed in an open-source, customizable framework that can be deployed without the need of IT/engineering staff. In order to instill responsible reporting among the partner organizations, Digital Green provides training to staff members from these organizations to enter data into COCO. This is duly monitored by the Digital Green staff at the field level.

ANALYTICS

Built on the COCO foundation, the Analytics System provides day-to-day business intelligence on field operations, performance targets, and basic ROI (return on investment) metrics relevant to the organization. The system is freely available and accessible online -- by clicking on the Analytics dropdown in the menu bar -- without the need of onerous technical infrastructure and expensive commercial licenses. The Analytics System is free for NGOs willing to reuse and repurpose the system as per their requirements



Figure 3: Two layers of DG software stack- COCO and Analytics
Courtesy: Digital Green

FEEDBACK MECHANISMS

Community members share their feedback with the CRPs at the time of video disseminations, who record their needs and interests on paper forms. These are later digitized onto DG's COCO data management framework and periodically analyzed. Often new topics relevant to a particular region have been identified through this approach. However, there typically is a lag of 10-15 days between when a farmer voices an issue and when it results in a response in the form of a new video or training programme.

In order to allay these time delays, DG worked to deploy an interactive voice response (IVR) question-and-answer system based on the Avaaj Otalo project.³ The IVR system, available via a toll-free number (1800 103 9111), primarily aims to support the community intermediaries involved in video production and dissemination. The IVR system is moderated by local subject-matter experts belonging to partner organizations, allows the users to record their queries asynchronously and receive responses from experts. The system is currently being piloted at a one-district level in Madhya Pradesh and there are plans to extend it further.

Methodology

In order to analyze the programme impact and verify good practice, existing documentation on the programme was studied. Based on this, a set of unique features and benefits were identified. These were confirmed and elaborated upon through an in-person interview with the Programme Manager- Strategy and Operations in New Delhi. Enhancements underway were also discussed at length.

KEY STAKEHOLDERS

The main stakeholders of this approach are Digital Green, local partner organizations and the farmers.

³ Avaaj Otalo, literally 'voice stoop', is an interactive voice-based system accessible through mobile phones for small-scale farmers in Gujarat. It was developed in 2008 by the Development Support Centre, Ahmedabad, and IBM India Research Laboratory, New Delhi. The most popular feature of Avaaj Otalo was a forum for asking questions and browsing others' questions and responses on a range of agricultural topics.

The Digital Green team was responsible for the innovation of the approach. It provides technological support for farmers to leverage their existing knowledge and for the partner organizations to implement their existing agricultural extension programmes more efficiently and cost-realistically. The organization works at two levels- the headquarters in New Delhi and the regional offices in the field. Digital Green is responsible for training Community Resource Persons (CRPs), who belong to farmer community, to act as collaborators between the farmers and Digital Green. It also provides the overall funding for technical tools and apparatuses.

Partners are the major stakeholders since they decide the programme direction, identify urgent local agricultural concerns and innovate according to local conditions. Partner organizations form the arms of Digital Green in different districts. Partners are chosen on the basis of their knowledge of the socio-economic conditions of a given geographical area. This gives them a very good understanding of farmer needs. Digital Green works with them to ensure that the process of technology delivery is optimized. Partners are provided tools for capacity building by Digital Green in terms of technology and training. In some places the partners are so well-established that Digital Green does not have to bootstrap to them. Partners provide both qualitative and quantitative feedback through COCO.

Farmers are mainly the beneficiaries of the programme. They are involved in the creation of videos, watching the videos, adopting the practices and providing feedback. The CRPs are also from within the farming community.

LESSONS LEARNED

Out of the 1624 videos produced till June 2011, 28.09 per cent feature female actors while 71.91 per cent videos feature male actors. The average time taken to produce a video is 7.75 days. Figure 2 gives a break-down of the content of videos produced.

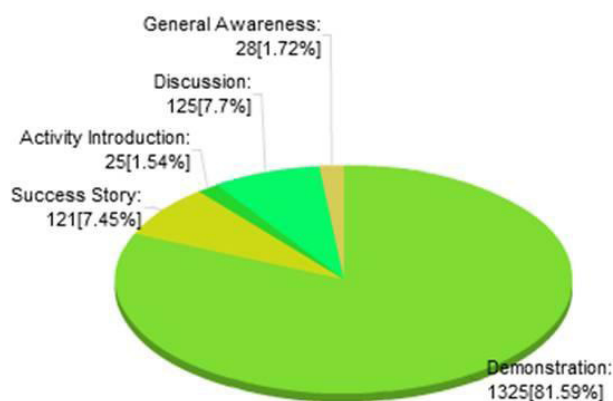


Figure 4: Video by contents
Courtesy: Digital Green

The impact of the Digital Green approach was apparent during its pilot project in Karnataka between April 2007 and April 2008. A cost-benefit analysis of the extension systems yielded the following results:

| EXTENSION SYSTEMS | COST (INR)/ VILLAGE/ YEAR | ADOPTION (%) / VILLAGE/ YEAR | COST/ ADOPTION (INR) |
|---------------------|---------------------------|------------------------------|----------------------|
| TRAINING AND VISITS | 40, 630 | 11% | 1846.7 |
| DIGITAL GREEN | 30, 473 | 85% | 178.9 |

Note: The figures have been converted from US\$ to INR using the average exchange rate for 2009 i.e. 48.37.

Source: 'Digital Green: Participatory Video and Meditated Instruction for Agricultural Extension'. Information Technologies and International Development Vol. 5 No. 1. Spring 2009

SUSTAINABILITY

In the context of DG, sustainability of the model can be measured along three parameters.

Firstly, the ability of the system to continue after its institutionalization is apparent in this case. DG works with partner organizations that are already working in the field of agricultural extension and builds their capacities to ensure that the programme continues even without the intervention of DG in the later phases.

Secondly, increasing participation of the community in processes of video creation, viewership and adoption implies that the farmers recognize the value of the programme. DG critically emphasizes the community's involvement in every aspect of the programme. For this, a simple yet highly effective feedback mechanism has been put in place for farmers to share their needs and interest in videos that are produced and screened. The CRP, who mediates video disseminations, is also chosen from among and by the farmers. The community also makes financial contributions toward the recurring costs of the system. A ticket-based payment mode, for example, in which individuals pay INR 2-4 to attend a screening often results in farmers wanting to increase the number of videos that are shown in a single screening.

Thirdly, the DG approach has provided a viable solution to the major problems afflicting government agricultural extension programmes- need for one-on-one contact with farmers and localization of content. A video can be created using local dialects, with familiar people acting in them, screened multiple times as per need, and with the help of only one mediator.

Based on local needs and resources

Digital Green recognizes that farmer communities are diverse and that agricultural extension videos must reflect this diversity. Therefore, content identification of videos is done by farmers themselves and videos, therefore, are based on local conditions and resources. For example, DG has produced videos for farmers based in southeastern Karnataka on making vermicompost using banana leaf biomass mud pots. However, it is not necessary that another village, for instance in Madhya Pradesh, would have abundant banana leaves for the same. Therefore, other materials must be used in the same biomass-to-vermicompost process.

Sound feedback mechanism

Human mediation in video disseminations is capitalized upon and the opportunity is utilized to receive direct feedback from the farmers at the time of screenings. New topics of interest and need are easily identified in this way. It accords farmers a chance to instantly receive clarifications to many of their doubts.

The IVR system-based toll-free helpline for farmers to refer to a variety of issues being discussed by other farmers, ask questions and get responses by specialists. The helpline is currently being piloted in a district in Madhya Pradesh and has showed tremendous promise.

GOING FURTHER

Digital Green has already been launched in Andhra Pradesh in the middle of June, 2011. The partner organizations have been identified and community mobilization is underway. Similarly, the programme is being scale dup to more districts in Bihar. Social media is being used to engage people from the developed world in activities that are happening in the developing world. Digital Green has developed a Facebook-based game called 'Wonder Village' where players can build a village by creating socio-economic conditions for the same.

Digital Green is working in backward, tribal regions in Madhya Pradesh to use mobile technology to deliver and create content in order to open up those farmers who have not been exposed to technology. At the same time, Digital Green aims to impact social policy by providing data and feedback from people in these interior, tribal belts to the policy makers. The aim is to show that change can be brought about by adopting mobile technology.



Digital Green is aiming to scale up to expand from farming concerns to those of livelihoods. Farmers are not engaged in farming throughout the year and this necessitates for them look at alternatives in terms of livelihoods.

Research was carried out by the OneWorld Foundation India (OWFI), Governance Knowledge Centre (GKC) team.

*Documentation was created by Research Associate, **Aditi Dayal***

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APPENDIX A – INTERVIEW QUESTIONNAIRE

Background

1. Digital Green is currently being implemented in 5 states in India. What were the criteria for choosing these states and particular villages within them?
2. Please provide details of your organizational structure. How many staff members operate in the field and what are their exact roles?

Working Design

3. The three main stakeholders of the program are the farmers, the local organizations/partners and Digital Green. Please elaborate on each of their exact roles in the program.
4. How are the 'resource persons' identified from within the community? How are the topics to be video-filmed determined?
5. According to our research, there is a technology platform for farmers to interact with others and ask questions to the experts by calling 1800 103 9111. Is this currently operational? Could you tell us more about the system in place for dealing with farmers' queries?
6. Exactly which technology/software is used end-to-end in the DG system?
7. How is revenue generated and what are the major areas under which they are spent? Please give a break-down of costs per month or annum for each.

Impact

8. Are there any new features recently introduced or in the planning phase for induction in the DG system?
9. Apart from video production and dissemination, are there any other initiatives that Digital Green is involved with?
10. Are there any plans for extension to other states in India?