CURTESY: DIGITAL GREEN

A GREEN
EXTENSION

A digitally-backed green revolution is sweeping India's countryside.

BY SANGITA THAKUR VARMA

It is a bit incongruous to find a game application on a website which is purported to have unleashed a quiet revolution in India's countryside. But right below the neatly stacked vignettes of farming activities is the link to the game which takes you to Facebook. You're inclined to dismiss it as a take-off on Farmville, another app that has 21 million FB community members hooked. But, Wonder Village, with 22,000 registered uset, does what it says—bridge the real and virtual, with the aim to raise social awareness and help raise funds for the development sector. There are many such techno-logical marvels in store as you trawl the website to understand what exactly Digital Green innovates.

Astronaut Grounded

Digital Green was established in 2006 in Bangalore by Rikin Gandhi, a young computer science graduate from Carnegie Mellon University and masters in aeronautical and astronautical engineering from Massachusetts Institute of Technology. A pilot with ambitions to become an astronaut, Gandhi changed course midstream. In fact, it was to help start a biodiesel venture on the wastelands of Maharashtra that had brought Gandhi to India. No one could have foreseen that the boy born and raised in the US would decide to soon 'reverse migrate' to India and work in the rural countryside.

Today, Digital Green's 'agriculture extension innovation' has wrought beneficial changes in the lives of 1,09,911 farmers of 1,541 villages belonging to six states of India. Not surprisingly then, the International Fertiliser Association (IFA) has recognised Gandhi for the 2012 IFA Norman Borlaug Award. In 2010, Gandhi also featured in Technology Review's Annual List of 35 Innovators under 35 years of age. The same year, he was one of the eight visionaries to feature in The Fortune Global Forum Visionaries List.

Extending Boundaries

Wikipedia defines agriculture extension as the application of scientific research and new knowledge to agricultural practices through farmers' education. Agricultural extension has not only been widely recognised as crucial to the growth of the farming sector, but given the changing nature and needs of the farmers, there is an added emphasis on developing newer approaches that are region and need specific.

Digital Green's extension innovation is exactly that. Firstly, it understands the importance of people in the dissemination of any knowledge to farmers. As such, the information and communication technology systems that it develops are in close consultations with the existing people-based extension systems and the people for whom

they are meant. The programmes are also deployed using grassroots social networks for wider outreach. Secondly, Digital Green communicates with the farmers in their own language. To put it simply, what the organisation does is to teach farmers to film and screen their farming best practices, by virtue of which they become 'extensions' or 'influencers' for their peer groups in the adoption of new technologies.

Digital Green's unique methodology adopts a participatory approach for local content generation. The videos are produced by farmers, filmed on farmers and screened for farmers. The organisation's reason for adopting the visual medium for disseminating agricultural extension was guided by the nature of the farming community. Farmers are more adaptive to visual instruction not only due to low literacy levels, but because the nature of their profession makes their auditory and visual senses sharper. A farmer can tell the age of a plant from the colour of its trunk. Additionally, a video is cost-effective in comparison with other medi-

ums. It can also be streamed repeatedly and is a demonstrative medium that can actually show results.

Gandhi has thus far produced 2,370 videos, which have been screened 1,13,823 times. As soon as your cursor hovers on the neat thumbnails on the homepage of Digital Green you realise they are video recordings of the extension programmes. It's like an online tutorial on diverse topics of rural interest: vegetable nursery bed preparation, microcredit and microfinance, pond treatment for pisciculture, raised bed sowing in kitchen gardens, etc.

The organisation, in partnership with an Indian manufacturer, is in the process of developing a mobile device that would function like a camera as well as a pico projector. The vision is to replace the pico projectors that cost ₹ 7518.5 (US$ 135) within the next five years. This could expand the reach of the programme by making it more affordable.

Scalable & Replicable

Gandhi has adopted a hub and spoke model for ease of scalability. Given the region specific nature of agriculture, the applicability of content is limited to an area of 2 to 20 km depending upon its usability. Each hub is a centre of excellence and is responsible for expert content production in the region, teacher training, distribution and networking—with all hubs interlinked. Each spoke village also produces localised content. The best practices of spoke villages are then streamed through the hub network to other spokes and hubs.

The production team comprises agriculture scientists from government institutions, practitioners from non-government organisations, field staff, farmers and volunteers. The films are sent out to the villages where they are screened in the evenings, a number of times, on a rotational basis to small groups of 10 to 20 people, as per their convenience. The screening is done using a human interface to make it interactive, instructional and also for the DG team to be able to prod audienc-

es' response and collect feedback. The screenings are followed by practical demonstrations during the day. All this however, requires a lot of motivation and hard work. Gandhi has developed a network of dedicated extension workers for diffusion of knowledge. The staff acts as a two-way channel to engage and enhance farmers' interest, explain and reiterate concepts, demonstrate methodology, help in implementation, and even assist in procuring tools. They follow-up on the progress of the farmers and help them build confidence to adopt a new methodology. They are the indispensable foot soldiers of Digital Green. Gandhi has also incorporated an interactive phone-based feedback mechanism in DG's framework.

Top-class Technology

In areas with limited internet and power connectivity, a video-based extension programme's outreach would be a little sketchy. Digital Green has innovated highly-sophisticated hardware and software platforms to overcome such limitations. It uses a web-based data tracking architecture which has been developed to function in constrained network conditions. COCO—Connect Online/Connect Offline—is a proprietary software developed by the organisation and forms the base of its software stack. COCO is a stand-alone application in the internet browser with the ability to support up to 100,000 users. It is a customisable open source framework and does not need specialised IT engineering support for deployment. Nor does it require additional software or high maintenance. Most importantly, the application can be taken offline where there is low or limited bandwidth without interrupting the usage. It requires internet connectivity only when the user, who can be anywhere in the world, needs to synchronise his data with that of the central repository at Digital Green. Digital Green's paper on the application—COCO: A Web-based Data Tracking Architecture for Challenged Network Environments
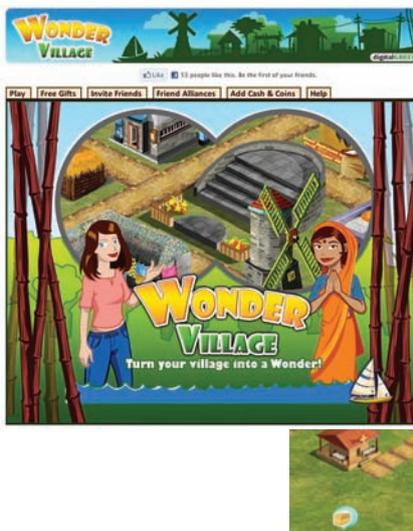
Reverse Migration Wonder Village, built by Digital Green's in-house team is a Facebook game application, much like Farmville, but with real life Indian village situations that make you think.

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Digital Green has evolved a monitoring system to keep track of day-to-day business intelligence on field operations, performance targets and RoI (Return on Investment) through an analytics system based on the COCO foundation and forming the second layer of its software stack. There is transparency in its systems and from financials to analytics—all are available on its website for perusal and learning. The analytics system which can be adapted for specific use, is available for other NGOs through a simple download and does not require a licence or expensive infrastructure.

Partnering for Outreach

A charitable trust, Digital Green is working currently with seven partner non-governmental organisations—PRADAN, BAIF, Samaj Pragati Sahayog, ACCESS, Action for Social Advancement, PRAGATI, and VARRAT. In 2010-11, it also partnered with the Government of India's National Rural Livelihoods Mission.

Gandhi's conviction that working with existing grassroots social organisations would improve cost-effectiveness and reach of the ongoing extension systems has been proved true. In the introduction to the Annual Report 2010-11,

he writes that in Orissa after their partnership, the cost-effectiveness of the interventions of two of their existing partners increased four to five times and the profitability per farmer in the first year itself was ₹ 13,482.9 (US$ 242). While the cost of per adoption in the classical extension systems worked out at ₹ 557.2-1002.6 (US$ 10-18), with the Digital Green model the cost has come down to ₹ 167.1-222.8 (US$ 3-4).

At such a small sum, the empowerment of the farming community is phenomenal and multipoint. It starts at the individual level—breaking down inhibitions and teaching new skills and ends in a ripple effect—the propagation of farming best practices, the impact of which can be far reaching.

Digital Green has indeed gone viral reaching out to farmers not only in India but Africa too. Gandhi is equally keen on harvesting the power of social media. From tweets on each new development in the Digital Green community, to Facebook status updates and Wonder Village, to the 8–10 minute video uploads filmed by the farmers on YouTube, Digital Green is making its presence felt. A paradigm shifting agricultural extension programme, Gandhi's Digital Green is an extension of the Green Revolution built on a 21st century technological framework of analytics, metrics, transparency and razor-sharp vision. ∎