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Assessing the Impact of Technology on Agriculture based Livelihood with special reference to Digital Green in Muzaffarpur District

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Abstract : *Assessment of impact is generally regarded as an essential part of the project cycle, and is already well known and widely used in many disciplines and there is increasing evidence of its application in agricultural research. The same pressures as are being felt in agricultural research apply in agricultural information: new technology, in the form of Information and Communication Technologies (ICTs) is increasing the ability to access, collect, process and generate information, but there is also pressure to justify investment, and to demonstrate results. However, while the knowledge of information culture may be burgeoning due to new ICTs, neither the methodology nor the culture of information impact studies is yet fully developed. Agriculture technology has revolutionized the irrigating methodology. The technology has resulted into many innovative equipments that have reduced time and energy invested into the farming. . In the modern times, farmers are equipped with agriculture technology that is latest and trouble free. The technology has resulted into many innovative equipments that have reduced time and energy invested into the farming. Digital Green is an agricultural training and advising system that seeks to benefit rural farmers by distributing information using medium that are easy to access and easy to understand e.g. digital videos.There are as yet few methodologies and applications relating to information management in developing countries, and even fewer which have been or could be applied specifically to agricultural technology.*

Key words: Agricultural information ,technology , ICTs,

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Introduction :

Indian economy is an agrarian economy. But the geographically dispersed, culturally diverse population of farmers of India remains disconnected from the modern world that could improve the sustainability of their livelihoods. With more than half of India's population depending on agricultural income, it becomes important to keep the sector developed and sufficiently rewarding for the farmer .In recent times, the field of extension has grown ***wider, it now includes the communication and learning activities organized for rural people by professionals from different disciplines, including agriculture, agricultural marketing, health, and business studies.*** There are numerous Government agencies, voluntary organizations, NGOs in India working closely with small holding farmers, Self Help Groups (SHGs) and Village Organizations (VOs) to promote new agricultural practices to improve their yields.

Digital Green :

Started in 2009 by an aeronautical engineer from MIT (Massachusetts Institute of Technology), Mr Rikin B. Gandhi, Digital Green is an NGO that focuses on disseminating targeted information via digital media to small scale farmers through existing extension system that will help increase their yield and enhance their productivity. The origin of the name, Digital Green, comes from adding a new dimension to support the aim of their first partner, GREEN Foundation. It produces participatory videos which explain in detail the targeted subject like various agricultural practices, interventions etc. and then shows it to the beneficiaries in order to encourage them to adopt these techniques. It aims to build a system that can scale agricultural advising support to even the smallest subsistence farmer.

The idea of using 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) Participatory process for local video production,

(b) A human-mediated instruction model for dissemination and training,

(c) An interactive model to better address the needs and interests of the community with analytical tools and interactive phone-based feedback channels.

(d)) A hardware and software technology platform for exchanging data in areas with limited Internet and electrical grid connectivity and

According to the organization itself, "The Digital Green system combines technology and social organization to improve the cost-effectiveness and broaden the community participation of existing agricultural extension systems".

Working: Digital Green does not work by itself; it partners with local organizations that have already been working in related fields and have substantial rapport with the farmer community. It bootstraps on the local expert knowledge of existing NGOs and farmers to disseminate targeted information using practically-oriented format – **videos**. It seeks to build on existing agricultural extension programmes.

Key Principles :

The key principles driving their work are:

- Partnership: Their focus is primarily on developing and delivering digital content to improve the cost-effectiveness and efficacy of organizations involved in agricultural and livelihood research and/or extension.

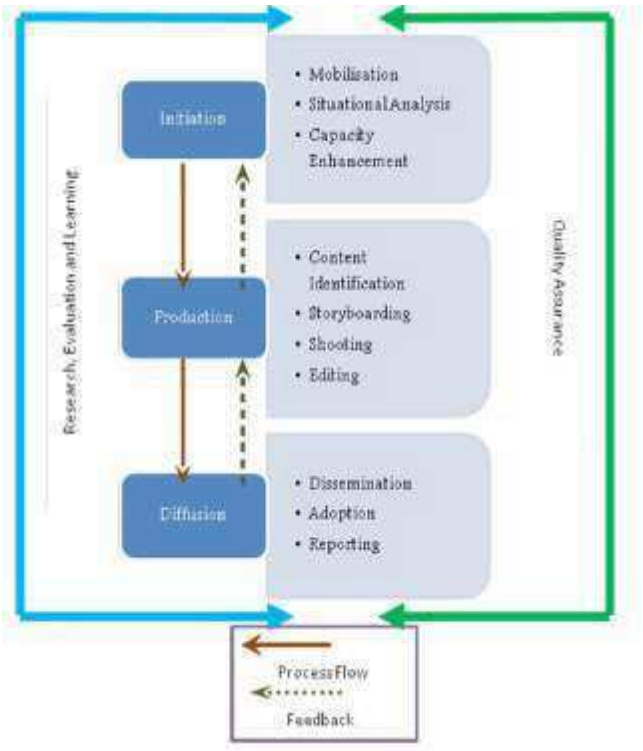
- Community ownership: Their goal is the adoption of knowledge exchange model by communities for their improved well-being.
- Localization: A human-centered and contextual design approach remains at the core of their work.
- Cost realism: They often operate in environments with limited infrastructure and financial resources, which entails paying attention to costs at all levels, and limiting the investment in expensive equipment.
- Mediation: Videotaped demonstrations per section are not a complete extension solution since they lack the interactivity expected of good extension.
- Training: They build the capacity of their partners, extension staff, and village facilitators in the social aspects of their approach for effective delivery of key messages.
- Gender: Particular attention is paid to the gender balance in recruiting women for video production.

Standard Operating Procedure :

Standard Operating Procedures (SOPs) is a step-by-step guide to implementing the Digital Green approach which has three main components–

1. Initiation,
2. Production and
3. Diffusion

Work flow of Digital Green system :



Comparision With The Traditional Approach:

The Digital Green content repository is video-centric which becomes important for a country like India, where by optimistic estimates the adult literacy rate is 74% and in farming community much lower.The video based approach has several important advantages to traditional forms of agricultural content, which is typically not in the local language, intended for a literate audience, uses expert terminology, lacks grassroots level practicalities, and remains inaccessible in a sea of scattered media.

- Farmers, by the nature of their occupation, rely on their auditory and visual senses and video, though not perfect, comes closest to capturing the scene in detail.
- Video creation tends to be faster and less expensive than other types of media, as advanced preparation in “lesson”-planning can minimize post-production editing.

- Farmers are most receptive to adopt new practices through demonstrative exhibition. That is, farmers must see the additional benefits of a new method in relation to the control results of the conventional approach.
- Video can compress the time needed to reveal the change.
- Video provides a means of bringing relevant demonstrations into the homes of farmers.
- Video also reduces the human resources required to follow-up with individual farmers and demonstrate time-consuming methods in the field.

Advantage Over Traditional Approach :

A cost-benefit analysis of the extension systems done in 2009 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. No. 5 Spring 2009

This shows how effective Digital Green approach can be. It reduces cost, increases adoption rate. A recent study concluded that farmers who adopted new practices realized an average gain of $243 over an eight month period. A rigorous randomized control trial to assess the impact of our work is underway.

Objective :

The objectives of the research project are:

1. To assess the preliminary impact of digital technology on agriculture.
2. To identify the awareness about agriculture based technology in rural community.
3. To analyse the impact of Digital Green on the adoption rate of
   (a) Non Pesticide Management (NPM)
   (b) System of Crop Intensification (SCI)
4. Vegetable Cultivation techniques.

To assess the impact of Digital Green on socio and economic aspect of life.

Hypothesis :

1. There is a significant impact of digital technology on agriculture among the farmers/beneficiaries in Muzaffarpur district.
2. There is a significant increase in awareness of people about agriculture based technology in Muzaffarpur district.
3. There is a significant impact of Digital Green on the adoption rate of NPM, SCI and Vegetable cultivation techniques.
4. Digital Green has brought a significant improvement in living standards of villagers of Muzaffarpur district.

Methodology :

(A) Area of Study : Survey of 300 households in Saraiya and Kurhani block of Muzaffarpur district to analyze the impact of technology on agriculture based livelihood.

(B) Data Analysis

- Collection of data, facts and figures of past 3 years to measure the success of Digital Green.
- Sampling and field work using participatory method.
- Desk review of secondary data.

(C) Method of Data Analysis

- **Primary Data :** Personal interview of villagers and staff of Digital Green, observation of data collected from previous surveys.
- **Secondary Data :** Newspaper, Magazine, previous reports and data collected on Digital Green from internet and its office.

(D) Tools and Techniques of Data Analysis

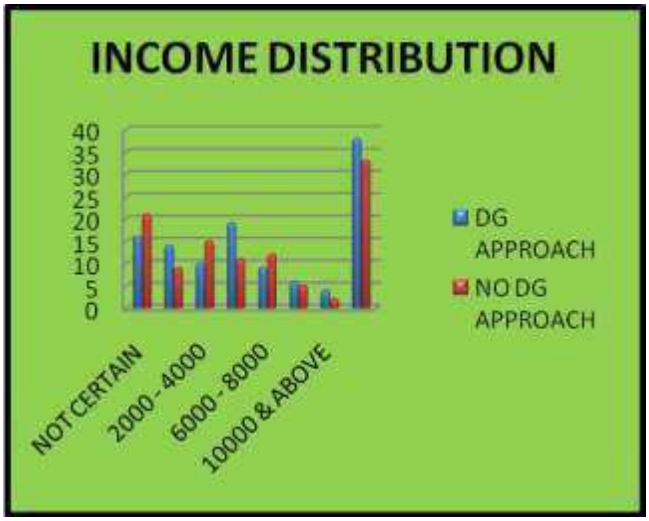
1. Representation by Pivot Charts
2. Representation by Pivot Tables
3. Test of significance

Case Study :

The study on "Accessing the impact of technology on agriculture based livelihood with special reference to Digital Green" was carried out at four villages of Muzaffarpur district. The information on the material used and techniques adopted during the course of investigation are described in this paper.

Comparison Between the Incomes of The Member Adopting Methods Shown by Digital Green and Not Adopting it

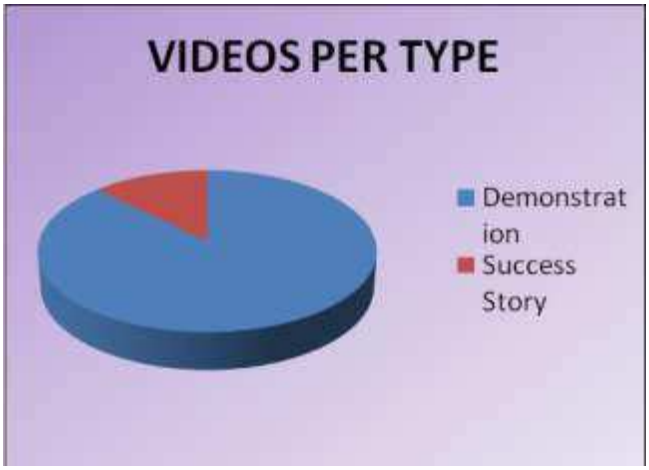
Income	DG Approach	No DG Approach	Grand Total
Not Certain	16	21	37
Below 2000	14	9	23
2000 - 4000	10	15	25
4000 - 6000	19	11	30
6000 - 8000	9	12	21
8000 - 10000	6	5	11
10000 & Above	4	2	6
No Earning	38	33	71
Total	**116**	**108**	**224**



Finding : The various indicators in the above analysis shows that the members adopting practices shown in Digital Green videos are in a better financial position than the members who are not adopting it.

Videos Produced By Digital Green :

Videos Per Type



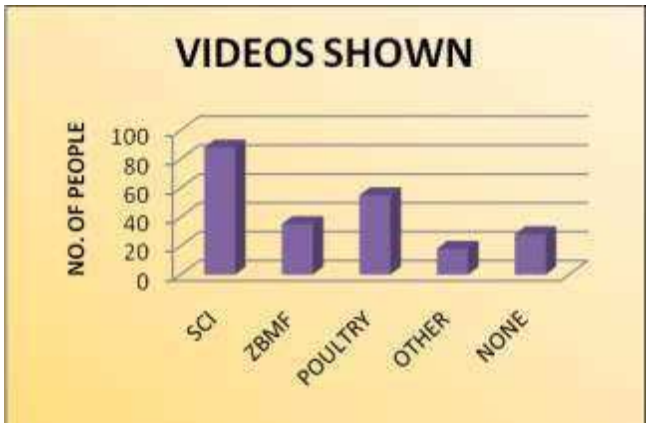
Findings: Majority of the videos (87.5%) produced are of demonstration type and only 12.5 % are Success Story videos.

Types of Videos Shown

Table

VIDEOS	NO. OF PEOPLE
SCI	88
ZBMF	35
POULTRY	55
OTHER	18
NONE	28
TOTAL	**224**

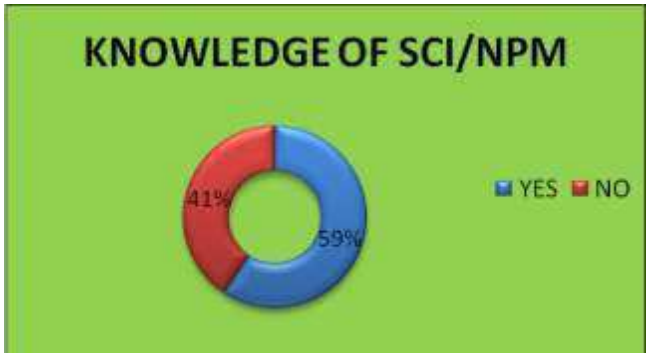
Figure



Findings : The majority of respondents (68 0ut of 224) have seen videos on System of Crop Intensification.

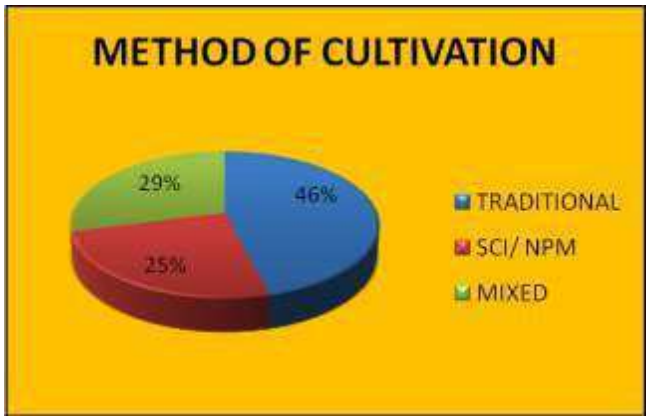
Findings: The analysis shows that 59% of the respondents know about SCI/NPM technique.

Knowledge of Sci/Npm



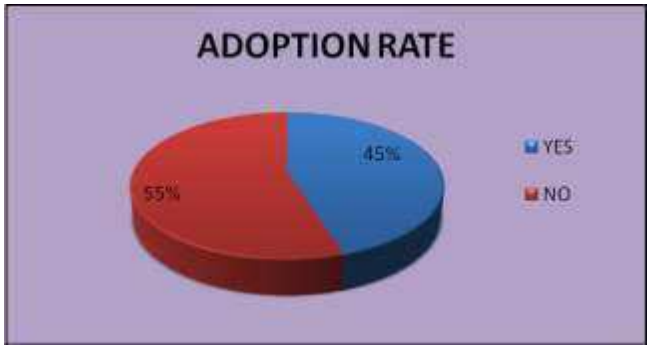
Findings: The analysis shows that 59% of the respondents know about SCI/NPM technique.

Method of Cultivation



Findings: As per the analysis done above 46% of respondents are still engaged in traditional methods. Only 25% of respondents are actually following SCI/NPM method of cultivation.

Adoption Rate



Findings: As the farmers associated with Digital Green are not totally aware of the proper implementation techniques, they are still hesitant to adopt them. 55% of respondents have not adopted.

Results :

1. Maximum no. of people (41%) in the surveyed SHGs were of the age group 31– 40 followed by age group below 30 (24%) and 41-50 (24%).
2. Paswans have the maximum involvement that is about 34% in the surveyed SHGs followed by Muslims (14%) and Kushwaha (11%).
3. The majority of members of surveyed SHGs are illiterate i.e. 55% and only 45% of them were literate.
4. The members adopting practises shown in videos are in a better financial position than the members who are not adopting it.
5. Majority of respondents (38%) have small land holdings that are between 0-5 kattha. One of the reasons that the adoption rate of Digital Green is low is because a large section of the farmers associated with it that is 18% is landless and thus cannot adopt the agricultural practices shown.

6. Majority of the videos (87.5%) produced are of demonstration type and only 12.5 % is Success Story videos.
7. Women are featured in all of the videos produced in Saraiya block.
8. The majority of respondents (68 out of 224) have seen videos on System of Crop Intensification.
9. The finding shows that 67% of respondents are engaged in producing wheat, followed by rice 59% .
10. The analysis shows that 59% of the respondents know about SCI/NPM technique.
11. It comes out that 46% of respondents are still engaged in traditional methods of cultivation. Only 25% of respondents are actually following SCI/NPM method of cultivation on their entire stretch of land.
12. As the farmers associated with Digital Green are not totally aware of the proper implementation techniques, they are still hesitant to adopt them.
13. From the analysis it can be seen that in around 172 households, there is no sanitation facility available.
14. The condition of electricity in the villages is pathetic, as 45% of the households are still bereft of this basic facility.

As per the analysis made, the water facility seems satisfactory as 165 respondents in the surveyed villages have their own hand pump and just few of them are dependent on others for fulfilling their need of water.

Conclusion :

Reaching the lives of almost two third of agriculture dependent lives of India is a mammoth task for any NGO, government organisation or public foundation. For that to happen, technology needs to be incorporated at every step. By striking a balance between human expertise and technological support, agriculture in India can meet the twin challenges of meeting the rising food demand of an increasing population and making the best use of the available resources.

In that sense, Digital Green is perfect to bridge the gap between modern world and Indian farmers. Working in the field of agriculture extension, it brings innovation closer to the rural population of India The video based approach of Digital Green has several important advantages to traditional forms of agricultural content. It is very direct, cheap and much more fast than the conventional information dissemination system. In this way, more number of people are served at the same time unlike the earlier method where the VRP used to visit individual households or farms to educate people. Digital Green has brought down the cost of information dissemination tremendously, almost by ten times and increased the adoption rate of agricultural practices. Like any other process, Digital Green's approach is also not error prone. There are shortcomings, areas that need to be worked on but altogether Digital Green is providing a much better information dissemination system in comparison to the traditional ones.

References :

Biswas, Soukit. (2013). *Digital Indians* : Rikin Gandhi helps farmers with Video. BBC News, 12 Sept. 2013.

Reddy, P.K. (2010). *IT Based Agriculture*. A Framework of Information Technology Based Agriculture Information Dissemination System to improve Crop Productivity (Online). 1.2.3.4.5.14. Available at : http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.102.1301 & rep=rep1$type=pdf (Accessed 14 Aug. 2013)

DG Annual (2013). *Annual Report*. [ONLINE] Available at : http://www.ietinagriculture.org//resources/annual_reports/#annualreport12. [Accessed 05 oct. 13]

ICT in agriculture (2013). Digital Green. (Online). Available at :http://www.ictinagriculture.org/content/digital_green [Accessed 19 Sept. 2013).