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Alternative agricultural extension functionaries in India: Substantive role of (ICTs) - study of e-Choupal

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Agricultural extension is now backing on the development agenda. The acknowledged failure of the traditional extension model in India has stimulated debate on extension reforms and the introduction of new extension models. Further, Indian agriculture has recorded an alarming 'knowledge gap' where 'knowledge' became central to agricultural production. The role of extension functionaries today is more challenging and demands structural and functional changes to meet the holistic needs of farmers and they have to equip themselves to cope with the drastic change and dire needs. Agricultural extension is not only about imparting knowledge and securing adoption of improved practices but it also aims at changing the outlook of farmers. Moreover, Indian agriculture is undergoing a rapid transformation under globalization from a simple making a living to complex endeavour. Information revolution leads to fundamental changes in economic, political, social and cultural relations. Information technology is the lifeblood of many other technologies. It is opined that there is direct relationship between communication and development of agricultural sector. New information technology provides the opportunity for innovation. The 'free flow of information' will help the farmers to overcome the knowledge gap and the availability of the new technology lead farmers to make real choice. This paper emphasizes on the role of ICTs in contemporary agricultural context and critically understands the failure of traditional extension functionaries.

Key words: Agriculture; extension; ICTs; sustainability, ITC.

INTRODUCTION

Agriculture is the center of rural social life and economic activity. High priority was given to agricultural development as agricultural surplus would drive growth of other sectors in the country¹ (Chaudhuri, 1992). Watson's (1976) defines agriculture as the 'systematic and controlled use of nature to improve the human condition'.

The term agriculture at a broader level refers to crop production, transfer of technology and agricultural marketing. It would be more meaningful to view agriculture not just as farming alone, but as a holistic value chain, which includes farming, wholesaling, warehousing, processing, and retailing (Govt. of India,

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State of Indian Agriculture, 2011-12).

With reference to India, after its Independence, the first challenge is to raise agricultural productivity through the application of scientific knowledge due to a serious food grain shortage and population growth outpaced food production. And also Indian economy largely depends on agriculture and allied activities, in this context state adopted new agricultural strategy known as green revolution which consists of the use of improved seeds, modern farm machinery to meet the challenges and seen as a great opportunity for the agricultural growth and holistic development (Umali and Schwartz, 1994; Gupta, 2012).

In India agricultural extension services¹ evolved with the introduction of green revolution, and still play a pivotal role in empowering farmers. Agriculture extension is a social innovation (work with farmers in the village communities) and prominent force in adopting new technology. It has been recognized that extension is a fundamental mechanism for delivering information and advice input for modern farming. It is also believed that the economic performance of the agricultural sector is largely determined by the organized research and extension (Swanson, 2008; Aker, 2011).

Changing scenario of agriculture and extension

India's agrarian history has been characterized as one of backwardness, poor technical inputs, low productivity and a capricious environment. Economic data such as 0% growth rate of agriculture from 1900 to 1947 has often been presented as evidence for this. For decades, Indian agriculture has remained traditional in character with primitive techniques and subsistence farming. Indian agriculture has been witnessing in low yields, limited income, and lack of capital to invest and has been a prey to the unpredictable monsoon (Jodhka, 2000; Richa, 2016).

The Agricultural development pursued by the development planners in the country led to considerable changes in the rural agrarian social structure and radical transformation has occurred in several facets of Indian agriculture. Public research and Agricultural extension system are the main mechanism which transferred the new technology to farmers. Agricultural extension and research is primarily responsible for the implementation of green revolution which resulted in noteworthy economic progress in India (Mohan, 1974; Vyas, 2004).

After 1960's agriculture scenario has become more

complex and undergone vast changes. The pace of commercialization of agriculture has taken place and agriculture shifted from traditional methods to scientific and commercial methods. Commercialization of agriculture describes two related processes, first a shift in the agrarian economy from production for consumption to production for the market and, second a process where land starts acquiring the features of a commodity and begins to be sold and purchased in the market like other commodities (Meera, 1995; Pingali, 1997).

Further, economic liberalization and the consequent changes in the global agricultural scenario have characteristically structured Indian agriculture as a diversified and commercialised venture. It typified unprecedented of private capital, free markets, advanced communication and production technology. The massive changes that occurred in agriculture sector demanded for reliable and relevant information. The extension system, at present, has to deal with the set of tasks it has to perform in each dimensions is substantially different (Byres, 1981; Kumbamu, 2009).

Farmers seem to have gained increased literacy levels and new sense of their rights, privileges and also have a wider horizon and broader range of contacts. The extension system, therefore, has to adopt a different approach of interaction with farmers. Further it is argued that present agricultural system requires substantial knowledge transfer to and among farmers, including information about successful farming practices, new technologies or controls of pest and disease outbreaks, and new markets (Glendenning and Pier, 2012).

Indian farmers are facing invariable challenges because of the introduction of High Yielding Variety (HYV) seeds, framers have to constantly catch up with newly evolving pests and weeds and deal with the declining fertility of soil, which chemicals alone are unable to replace. Moreover, as the cost of cultivation is increasing every year without commensurate increases in the prices of the produce (Richa, 2016). Thus, the farmer is now required to make more adjustments in his farming, more extensively and much more rapidly.

Critique of traditional extension services

India has one of the largest agricultural research systems in the world. Public extension system has been playing a crucial role in disseminating technologies. It is argued that the public extension system which responded adequately during the green revolution era has not been able to keep pace with the contemporary challenges emerging from domestic and international agricultural sector. In spite of outstanding achievement in food production, public agricultural extension heavily criticised for its many shortcomings and failures (Patil et al., 2001).

Number of studies (Maru, 2004; Rao, 2005; Aker, 2011) report that appropriate, continuous, and timely advice about farming is not reaching farmers thus hampering the

¹ . Since independence, State has initiated various extension programmes like Training & Visiting (T&V), DAATTCs = District Agriculture Advisory and Transfer of Technology Centres, KVK = Krishi Vigyan Kendra, ATIC = Agriculture Technology Information Centres, The Agricultural Technology Management Agency (ATMA). State Agricultural Universities, the Agri-clinics and Agribusiness Centers (ACABC) Scheme and Farmer Field Schools are operated by State. However, ICAR/SAU frontline extension system plays a catalytic and supportive role (Hansra and Adhiguru, 1998).

productivity. Information in traditional extension system flows from top to bottom and is supply-driven rather than demand driven and lacks the feedback mechanism. Moreover, traditional extension methods are expensive and bureaucratic with rigid hierarchical structures. Finally, Indian agricultural extension is more of an information delivery system than an information acquisition system (Sharma, 2007).

The ideological basis of trickle down, unfortunately, did not happen. Over the years the belief of 'trickle down' effect through 'contact farmers' or 'progressive farmers' has not taken place up to the expectations because the extension workers could not visit villages frequently and establish direct rapport with the farmers. Contrary to this what took place was the spread of misinformation or information in a contrived form which was readily grabbed by the emerging class of farmers, i.e. marginal and small landholders belonging to the lower sections of the caste hierarchy (Van den Ban and Hawkins, 1996; Mencher, 1978).

Traditional extension system was not equipped to tap the creativity and potentiality of innovative farmers found in every community. The extension system in India remains non-responsive to the demand of its clients and thus it has become static and often irrelevant. The existing models of technology transfer have been found to be of little relevance in the present context of agriculture which is highly knowledge driven (Witcombe, 1999). Despite great criticism and reduction of public investment the traditional channels of communication (extension system) still remain important because majority of the small and marginal farmers depend on them. Small and medium farmers who do not have access to public extension services will be eventually displaced from commercial production (UNDP, 1991; Ameer, 1994).

Further, Indian agriculture system recorded an alarming 'knowledge gap' where 'knowledge' became central to agricultural production (Scott, 1988; Tichenor et al., 1970). India has 30,000 agricultural scientists generating scientific information to serve 103 million farm families. It is estimated that only about 30% of the available technologies are adopted by the farmers and argued that despite number of initiatives, policies and well-organized agricultural extension manpower, around 60% of farmers in the country hitherto remained un-reached and un-served by any extension agency or functionary because there has been no recruitment of the staff since 1998 (Hansra and Adhiguru, 1998). Whereas, contemporary agriculture needs timely and appropriate information at minimum cost. Continuous two-way interaction between farmers and agricultural scientists is required, which is critical missing component of traditional agricultural extension system (Chang, 2009).

On the other hand, the role of state has become minimal during the post-reform period and the policies pursuit resulted in a reduction of public investment in rural infrastructure, including irrigation, agricultural

research² and extension services.

The post-reforms, thus seen as inimical to petty production in general and agriculture in particular (De Roy, 2017). Evenson et al. (1999) observe that the share of public spending on agricultural research and extension services in GDP of agriculture in India has been lower than that observed in the 1990s in developed nations (2% to 4%), and the average share in developing nations (0.75%).

In this context it is opined that, a new paradigm of agricultural research and development is needed which includes sustainability of agriculture, use of environmentally friendly science and technology, development of human capital, enhancing the management of agricultural activities and improving technical skills of farm households and post-harvest technology (Hansra et al., 2008). Agricultural extension in the 21st century demands structural and functional changes to meet the holistic needs of increasing agricultural production and information has become catalyst for profitable agriculture. Moreover the post-reforms era has made farmers to think the role of public extension and demand for modification of old strategies (Antholt, 1992; White, 2003).

It is opined that the use of IT (Information Technology) will help the extension system to function more effectively in meeting small and marginal farmers' information needs. It is assumed that IT is going to play a pivotal role in extending agricultural extension service more effectively to farmers beyond transfer of technology. The prolific growth of information technologies has truly revolutionized the communication scenario. These technologies offer a great scope for speedy and easy access to information along with higher accuracy. In nutshell, the contemporary agricultural scenario presents a picture of multiple challenges. These include (a) globalization and commercialization of agriculture which makes small and marginal holdings vulnerable (b) emphasis on privatization, leading to the withdrawal of a state from extension services, concern for sustainability and ecology and environment degradation (Murphy 2012). To face these challenges, there is an urgent need for an effective extension agricultural system which can help farmers to face these challenges.

Emergence of e-Choupal

Commercialization of agriculture gave rise to specialized client and demand for location specific extension services

² .Agriculture research was primarily responsible for the success of green revolution in India (Mohan 1974). But it is viewed that the fragile linkages between extension and research have refused to improve the quality traditional extension system, persisting stubbornly even today, is one the important factors contributing to the failure of the traditional extension system. Moreover, the research centres are not still full equipped in relation to technology development.

Table 1. Caste wise distribution of the respondents.

Caste	No. of respondents (%)
Other castes (OC)	42(35)
BC	22(18)
S C	31(26)
Nomadic Tribes (NT)	25(21)
Total	120

Source: Field survey 2014.

Table 2. Landholding pattern.

Type of land holding	Number of respondents (%)
Marginal (below one 1 ha.)	43 (36)
Small (1 to 2.0 ha.)	28 (23)
Semi-Medium (2 to 4 ha.)	26 (22)
Medium (4 to 10ha.)	17 (14)
Large (above 10ha.)	6 (5)
Total	120 (100)

Field survey 2014.

Source: Field survey 2014.

which are not catered by public extension system. Realizing the inability of farmers to access information, governmental and non-governmental agencies have come forward to establish IT kiosks in rural areas in order to serve the farming community with the latest advancement in information technology. Applications of ICTs (Information communication Technologies) in agricultural extension are often seen as a means of overcoming the limitations of conventional/traditional extension approaches (Annamalai and Rao, 2003; ITC, 2010; Marco and Zhou, 2012).

e-Choupal is one of the private IT based initiatives which integrates information services with market facilities. It was started in the year 2000 by ITC with an objective to provide linkage between farmers and the agricultural markets. e-Choupal can be seen as a medium of delivering critical market information, thus allowing farmer an empowered choice of where and when to sell the crop. e- Choupal claims to offer farmers more control over their choices thus helping them to gain higher profit margin (Kumar, 2005).

METHODOLOGY

In the given context, the present study made an attempt to provide a comprehensive understanding on e-Choupal and its potentials. There is a need to understand the issues of access and inclusion of ICT based agricultural information to all sections of farmers. The study relied on empirical evidence. Qualitative and quantitative methods were used in data collection. Data were collected from 120 households in Parbhani district (Maharashtra State) spread across two villages (Asola and Malsonna). In-depth interviews and

intensive interactions with the respondents and participant observation constituted the core of the study methodology. The researcher aimed to understand the potentiality and the substantive role of the ICTs and how ICTs are different from traditional extension system in delivering information.

RESULTS AND DISCUSSION

Profile of the respondents

Data were collected from 120 farmers located in two villages. Respondents belong to different castes like Kumbi, Patil, Dhangar and Vanjari, Mahar and Mang. The name OC is used to refer to these castes because all these castes are the dominant castes in the region. The status of dominant caste comes from the large land holdings the castes own in these villages. These castes are also politically dominant. Table 1 suggests that apart from the respondents belonging to OC (35%) respondents from SC, BC and NT are also included in the study.

Landholding pattern among the respondents

The size of land holding plays a crucial role in accessing agricultural information, credit, and in the commercialization and mechanization of agriculture. A majority of the respondents included in the study belong to the marginal and small farmer category. About sixty one per cent of the respondents own less than five acres of land. About five per cent of the respondents include farmers belonging to the large farmers' category (Table 2).

Accessing agricultural information or advices

Agricultural information needs of farmers in the region (Parbhani District) is becoming much complex because of commercialization of agriculture. Commercialization of agriculture needs quick and effective advices regularly. Close linkage with market for marketing the produce and procuring inputs for cultivation have led the farmers of the region to seek out information from the external sources. With the introduction of e-Choupal there has been a perceptible change in the sources of information for farmers. As presented in Table 3, 53 out of 120 farmers have been seeking advices or agricultural information from e-Choupal.

Marketing the produce

After the commercialization of agriculture, small and marginal farmers generating a marketable surplus of food grains and procuring produce at markets. Over the decades, many small and marginal farmers have been

Table 3. Advice on field problems.

Caste	No. of respondents (%)						Total
	Neighbours	A.O.	Call centers	Input dealers	e-Choupal	Multiple sources	
OC	4 (10)	4 (10)	0 (0)	10 (24)	22 (52)	2 (4)	42 (100)
BC	0 (0)	0 (0)	0 (0)	10 (45)	7 (32)	5 (23)	22 (100)
SC	5 (16)	0 (0)	0 (0)	15 (48)	4 (13)	7 (23)	31 (100)
NT	0 (0)	0 (0)	0 (0)	3 (12)	20 (80)	2 (8)	25 (100)

A.O. = Agricultural Officer; Call centres = Kisan call centre of the government of India; Multiple sources = more than one source, which include, for example, a combination of input dealers and fellow farmers.

Source: Field survey 2014.

Table 4. Marketing the produce.

Caste	No. of respondents (%)			Total
	MC	Middlemen	Local market (nearby towns)	
OC	42 (100)	0 (0)	0 (0)	42 (100)
BC	22 (100)	0 (0)	0 (0)	22 (100)
SC	30 (25)	1 (1)	0 (0)	31 (100)
NT	22 (100)	0 (0)	3 (3)	25 (100)

Source: Field survey 2014.

facing immense difficulties in marketing their produce. As the rural areas suffered due to inefficient market linkages and ineffective procurement system, small and marginal farmers prefer to sell off most of their produce in the traditional local markets at very low prices immediately after the harvest. It is widely reported by Planning Commission (2011) that the rural markets witness interlinked transactions and are dominated by certain sections of people (traders and money lenders) who thrive on the exploitative practices. Small and marginal farmers suffer serious disadvantages in the traditional marketing and distribution.

The focal point of interface between farmer and e-Choupal is the information related to agriculture, whether it is about market price of agricultural produce or a weather forecast or appropriate inputs, farmers approach the kiosk set up by ITC. For example, farmers approach Promoter to know about the market price of the produce s/he intends to sell. Farmers enquire about the current price of the produce on the particular day. If farmers satisfy with the price offered by ITC, they show their willingness to sell their produce at the ITC hub. Farmer compares the e-Choupal prices with the mandi prices and weighing the merits of each s/he decides up on selling the produce.

Marketing of agricultural produce in the study villages witnessed tremendous changes with the entry of ITC into the agricultural market and extension services through e-Choupal. Table 4 explains that almost all the respondent farmers (96%) sell their produce at the ITC procurement hub. When the reasons for such a shift from traditional market to ITC hub were ascertained from the respondents, it was found that e-Choupal procurement

system is hassle-free, transparent and makes immediate payment. Farmers observe that e-Choupal services are better than local mandis and also that the transactions in local mandis are secretive and exploitative. It was said that while the mandi traders pay the amount in instalments or pay after a few months, e-Choupal allows them to collect cash immediately. Moreover mandi collects a fee from farmers. Many farmers stated that at the local mandi the marketing process is very complex and unfair, whereas in e-Choupal it is transparent and the loading and unloading charges are paid by e-Choupal itself. It was found that although the price offered for a given product, for example, soyabean, at the local mandi, is high when compared to e-Choupal, farmers prefer to sell at e-Choupal because the transaction is completed within 3-4 hours and there is also a reduction in the transportation cost.

It may be ascertained from Table 5 that the information priorities are varied across caste. As it is evident from the data, farmers belonging to the OC castes give more priority to marketing the produce, knowing about latest agricultural practices, input services, getting access to the Promoter of e-Choupal and information on markets and price trends. In the case of BC farmers the important issue for them is marketing the produce. The other information needs like market information and price trends, information about crop insurance and crop loans, and information on government subsidies have emerged as key in the perceptions of BC farmers. The SC farmer respondents prioritize marketing the produce and information on crop loans. Their other priorities are knowledge about agricultural practices which can help them in reducing the cost of cultivation and information

Table 5. Caste wise ranking of information needs.

Rank	Farmers' information needs	No. of farmers (%)			
		OC	BC	SC	NT
1	Procurement of the produce	42(100)	19(86)	15(48)	22 (88)
2	Latest agricultural practices	40 (95)	10 (45)	13 (41)	11 (44)
3	Input services	40 (95)	11 (50)	11 (35)	9 (36)
4	Access to the e-Choupal	37 (88)	7 (32)	4 (13)	11 (44)
5	Market information and price trends	37 (87)	20 (91)	13 (41)	18 (72)
6	Export of produce	33 (79)	10 (45)	9 (29)	7 (28)
7	Solution to the problems in cultivation	33 (79)	16 (72)	5 (16)	7 (28)
8	Reduce the cost of cultivation	33 (79)	9 (41)	13 (42)	15 (60)
9	Weather Forecast	33 (78)	12 (54)	12 (38)	10 (40)
10	Soil testing	28 (66)	7 (32)	6 (19)	9 (36)
11	Crop Insurance	27 (64)	18 (81)	9 (29)	11 (44)
12	Field trails	19 (45)	1 (1)	0 (0)	4 (16)
13	Information on crop loans	18 (42)	18 (81)	25 (80)	17 (68)
14	Advices from scientists	14 (33)	9 (40)	5 (16)	6 (24)
15	Government policies	13 (30)	17 (77)	9 (29)	8 (32)

Source: Field survey, 2014.

on market and price trends. The information priorities of the NT farmers are information about marketing the produce, on crop loans, market and price trends, and knowledge about practices on reducing the cost of cultivation.

As discussed earlier that caste is a key social institution which plays an important role in agriculture. This is because caste determines the extent of social capital farmers have. It is observed that the anxieties of BC, SC and NT farmers about the information on crop loans, crop insurance, and knowledge about the practices related to reducing the cost of cultivation are not the main priorities of the OC farmers. The OC farmers who were the first beneficiaries of green revolution have required knowledge about crop loans, crop insurance, etc. whereas the BC, SC and NT farmers who lack the social capital and who entered into commercial agriculture recently feel the necessary of information on those issues which add risk to agriculture. Table 5 suggests that except on marketing the produce and market and price trends on which there is a common feeling across castes, other information priorities do not match with each other. This finding highlights the fact that the information needs of the farmers are not uniform and vary based on caste and land holding.

Summary

e-Choupal binds a large number of farmers into its network. It is observed that the number of farmers attending the meetings conducted by e-Choupal has increased. Promoter encourages farmers' participation in

the agricultural meetings. It is stated by the respondent farmers that before the establishment of e-Choupal, farmers used to participate in agricultural meetings occasionally. e-Choupal involves a majority of the farmers in the market mechanism by creating awareness regarding the price trends of the agricultural products. However, on the other hand, it also monopolizes channels of agriculture related information and products, as well as the rural market for many other services and products.

e-Choupal model demonstrates that a large corporation can play a major role in increasing the efficiency of an agricultural system and create a platform that benefits farmers. e-Choupal has brought tremendous change in the behaviour of the farmers in this region. Now farmers are able to access the global information and practicing scientific methods in cultivation. Traditional extension services are restricted to large and educated farmers whereas ICT based extension services are open to all the sections of farmers. It is observed that farmers from different categories are accessing agricultural information from e-Choupal on various issues like procurement of the produce, latest agricultural practices; reduce the cost of cultivation and weather forecast etc. However, majority of the farmers are unable to access agricultural information before the establishment of e-Choupal.

It is also observed that the presence of e-Choupal made the agricultural extension officials nonchalant to the information needs of the farmers. Sociologically speaking, such a phenomenon becomes problematic for the reasons that over a period rely on e-Choupal may lead farmers to become gullible partners in the scheme of corporate hijack of agriculture. Moreover, non-state

initiatives always show their disinclination towards the poor, weak and marginal communities. Lacking the welfare motto, the private extension approaches may exclude these farming communities.

Conclusion

Agriculture is influenced by the state policies like credit, market price of the product irrigation etc. Public delivery of extension services in developing countries is perceived as superseded. Access to timely information is crucial requirement for contemporary agriculture system but it is observed that rural farmer's still has difficulty in accessing information in order to make timely decisions. The Government is also reluctant towards finding the solutions and to overcome the problems that nailing the underdevelopment of public extension services.

The private extension services usually concentrate high value crops, which have both domestic and global markets. Only the so-called progressive and wealthy farmers are able to utilize these services as they can afford to pay for the services. The major drawback pointed out in private extension is the lack of human face and exploitation of marginal farmers. This can create a great imbalance among the farmers and the gap between the rich and poor farmers will be widened.

CONFLICT OF INTERESTS

The author has not declared any conflicts of interests.

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ⁱ.The agriculture sector, which engages 64 per cent of the rural workforce and half of the farmers' income comes from crop cultivation (Srivastava et al., 2017).