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Contextualizing Information Communication Technologies: Sociological Study of e-Choupal

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The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

One of the important characteristics of the developing societies is the rural and subsistence agrarian economy. Agriculture, carried out by small land holders, face problems of technological and non-technological nature. Increase in marginal and small land holdings on one hand, and the withdrawal of state support to agricultural extension on the other hand is leading to unprecedented agrarian crisis in the country. Growing commercial and specialized nature of agriculture demands quick and technically sound advice, based on scientific analysis with appropriate marketing information. In this context, Information and Communication Technologies (ICTs) have emerged as important means of agricultural information communication dissemination. It is considered that ICTs disseminate knowledge to farmers to make choices and reduce the information asymmetry. In this context, the present paper discusses the nature and form of ICT based agricultural extension services. It problematizes the socioeconomic and political embeddedness of the ICTs in delivering agricultural information. The proposed study attempts to critically understand how ICTs help overcoming the structural barriers, social, economic, political, cultural, in delivering agricultural information to farmers in general, and the small and marginal farmers belonging to the lower strata of society in particular.

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1. INTRODUCTION

One of the important characteristics of the developing societies is the rural and subsistence agrarian economy. Agriculture has been an integral part of the traditional culture in Asia, including India, where farming was a self-contained system [1]. Agriculture has been the anchor for achieving socioeconomic growth, it is perhaps more important as governing a way of life and forms of organization and patterns of value. Indian rural life is completely identified with agriculture and activities that supported by agriculture where it is embedded in the iniquitous caste system' [2].

Jodhka (2014a) [3] observes that Indian villages vary significantly in size and in their social fabric. Their character is determined more by regional agrarian histories and the local trajectories of social, economic and ecological processes. 'Each agriculture zone has its own style of life because farming routines and material conditions dominate the human experience'. There are varied and identifiable regional agricultural complexes in which each region has its own cultivation patterns, knowledge systems associated with them, socioeconomic relations and political structures. India's agriculture has long been associated with diversity that resulted from a combination of a wide variety of agro-ecological zones and a plurality of cultures.

Growing commercial and specialized nature of agriculture demands quick and technically sound advice, based on scientific analysis with appropriate marketing information. However, the agricultural extension system which is supposed to play an important role in disseminating agricultural information to all sections of farmers proved to be ineffective in providing latest and timely information. The conventional agricultural extension system largely focuses on the progressive farmers who have enough capital to invest in new technologies. The role of agricultural communication has expanded to include aspects of mobilization of farmers through transformation of attitudes and values in tune with knowledge [4].

2. ROLE OF COMMUNICATION

The role of communication in agriculture has been realized world over during the expansion of agriculture. Agricultural extension in India

emerged during 1945-50. Information was identified as the missing link in the development chain [5]. It was realized that the major developmental programmes would not reach their targets without adequate and planned communication inputs [6]. It is argued that communication can help farmers to raise their aspirations and motivations, obtain access to information and knowledge, and learn what 'know-how' is necessary for the adoption of technology. Communication plays a key role in facilitating the participation of people relating to sustainable development. The communication channel that carries a new idea is important in determining an individual's decision to adopt or reject it [7].

Information and Communication Technologies (ICTs) have emerged as an important means of agricultural information communication dissemination in 21st century [8]. ICTs are believed to play an important role in bridging the information gap by providing two way communication. It is considered that ICTs disseminate knowledge to farmers to make choices and reduce the information asymmetry, which exists between farmers and agricultural scientists. It is also claimed that ICT based agricultural information can act as catalyst to enable better adoption of improved technologies, seed varieties, and farming practices even at small, marginal farm holdings [9]. Computer mediated communication has been described as a different state of communication, which 'may change the psychology and sociology of the communication process itself...(creating) new linguistic entity with its own vocabulary, syntax and pragmatics' [10].

2.1 e-Choupal

Among many ICT initiatives in agricultural extension e-Choupal is the most widely used and popular one. e-Choupal was started in the year 2000 with an objective to provide linkage between farmers and the agricultural markets. The major focus of the initiative is to provide information about market prices on different crops to farmers at the village level. Traditionally, agricultural produce is sold in the mandis¹.

¹..Mandis are the age old major agricultural marketing centers in rural areas. A typical mandi is a local market, which is specific to a particular geographic location where a large majority of the small and marginal farmers sell their produce.

e-Choupal is one of the private initiatives in agricultural extension which integrates information services with market facilities. The e-Choupal initiative is a part of ITCs² Agri business and Information Technology initiative. e-Choupal consists of 6,500 kiosks, serving four million farmers in 40,000 villages in 10 states [11]. e-Choupal refers to a kiosk located in a village equipped with computers with internet access. e-Choupal is managed by Sanchalak, a local farmer, who bears the operational costs. The e-Choupal aims to provide an alternative marketing channel, information on local district weather, agricultural best practices, soil tests, feedback on quality of crops, and input sales to farmers [12]. The main purpose of the kiosks is to reduce procurement costs and provide timely information. Farmers, who access information, prices of particular products, can sell their produce directly to the ITC or at mandi [13].

2.2 Functioning of e-Choupal

e-Choupal kiosk is established in villages where population is above 3500. 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 also provides information on crop prices, weather, scientific farming practices, crop insurance and soil-testing services. e-Choupal collects information on weather from state weather department and also gathers information on modern farming practices and market price from different state, national and local markets. This information is uploaded onto e-Choupal web site. All information is customized according to farmers' requirements in local language (Marathi). Information provided at e-Choupal is free of cost which encourages farmers to access information and change their transaction behavior. The revenue for the e-Choupal project is not dependent on transactions stemming from the direct use of the computer, but rather from a business proposition that has been enabled through the exchange of information.

e-Choupal, in collaboration with different organizations like agricultural universities, meteorological department, and local research stations conducts meetings in the villages where kiosks are set up. It facilitates the conduct of field trials, soil tests and introduction of appropriate technologies suitable to the area by the

agricultural university and other research stations. The state Department of Agriculture provides information regarding the availability of fertilizers and pesticides at the local level. e-Choupal claims to offer farmers more control over their choices thus helping them to gain higher profit margin, and access to information that improves crop productivity. By providing transparency in transactions e-Choupal claims to have gained the trust of the farmers. e-Choupal aims to enhance the returns on agriculture through the dual strategy of ICT-led improvements in production and procurement efficiencies. e-Choupal therefore seeks to leverage ICTs to integrate rural areas into global markets.

e-Choupal claims to tackle the problems of fragmented farms, weak infrastructure, and large number of market intermediaries in the Indian agriculture. This model uses information technology, i.e., internet as an important tool to deliver information with vertical coordination. This system has not eradicated the intermediaries totally but it uses them (intermediaries) for popularizing e-Choupal. It concentrates on setting up of direct marketing channel linked to the mandi system for price comparison and simultaneously eliminating wasteful intermediation. This reduces transaction cost and makes logistics efficient [14]. In cases where the ITC - hub is not present it appoints intermediaries. These intermediaries purchase the produce directly from farmers and pay the amount immediately. ITC pays commission along with the cost of bagging to the intermediaries, whereas farmers have to pay weighing charges to the agents.

2.3 Sanchalak

The Sanchalak is a key functionary in e-Choupal. e-Choupal kiosk at the village level is maintained by the Sanchalak. The Sanchalak is one of the farmers of the village where e-Choupal kiosk is set up. Criteria for the selection of the Sanchalak are land holding, education and personal status of the individual farmer in the village. Typically a farmer who is a large land owner (between 8-10 acres, however, this varies from village to village, depending on the average size of land holding), who is well respected, who has been actively following market situation, who can read and write and who has enthusiasm to know new things is selected as Sanchalak for the village. The Sanchalak acts as a bridge between e-Choupal and village farmers. The basic task of

² . Indian Tobacco Company

the Sanchalak is to disseminate the agricultural information to farmers which is received from e-Choupal web portal. e-Choupal kiosk is established in the house of the promoter.

2.4 Supervisor

Supervisor plays an important role in the initial stages of setting up e-Choupal, and in the selection of Sanchalak because s/he is assumed to be aware about the village structure and farmers. Persons who have been actively engaged in the functions of mandi as intermediary are often selected as Supervisors. Supervisors are employed by the ITC to look after functions like maintaining records, payment of cash to farmers, stock entry, etc. Supervisors also take up functions such as bagging the produce purchased from farmers, labor management at the hub, handling paperwork, etc. Supervisors are appointed by the company to coordinate with Sanchalak, document information at the procurement center level, collect information about market prices, ensure transport of produce to the processing center, supply of inputs to the Sanchalak and to strengthen relations between farmers and the

Sanchalak. ITC hires traditional commission agents as supervisors in e-Choupal who manage information and collect day-to-day price information from local mandis. Thus, it may be said that the intermediaries are not removed from the process, but their roles are redefined as supervisors.

2.5 Inspection and Grading

When farmers bring the produce to the ITC Hub the Quality Controller (Chemist) tests its quality by taking a sample. The quality of the produce is assessed physically by observing the produce for any foreign matter (other than the produce that is sold, for example, soybean is checked for any other matter than seeds, hay, stones, etc.). Deduction for foreign matter is done in the presence of stones, hay, etc. Based on the Chemist's assessment of the quality and appropriate deductions (if any) to the benchmark price, a conditional quotation is given to the farmer. After this the sample is tested for quality and moisture content by using an electronic machine. This is done in the laboratory by the Agricultural Scientist employed by the ITC.

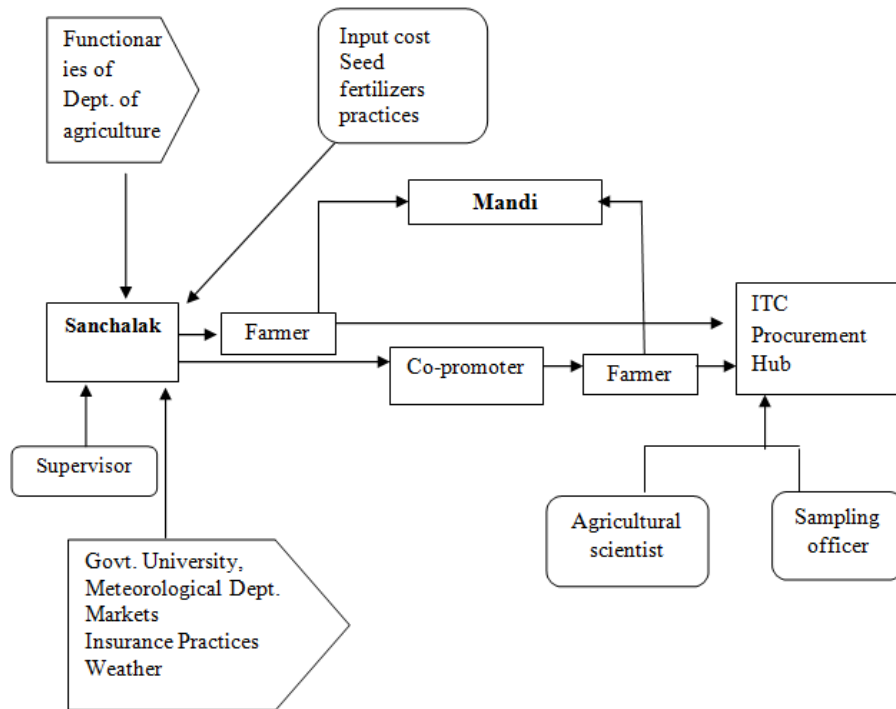


Fig. 1. Organizing, functioning and operation of – e- Choupal

VLW: Village Level Worker
 MSP: Minimum Support Price

The important point to note is that these quality control checks are transparent as the process is done in the presence of farmer and farmer has the right to accept and reject the price quoted. If the farmer feels any inconvenience about the results s/he can ask for re-sampling and retesting the quality. The previous day's closing price at the ITC Hub for specific produce is used to determine the benchmark for Fair Average Quality (FAQ) price. Generally the previous day ITC Hub prices are communicated to the Promoter through the e-Choupal portal. Usually farmers enquire about the previous day's price information and current day's price before they take their produce to the procurement Hub.

2.6 Payment

The higher price is paid to the high quality produce. The quality of the produce is deemed to be high when the bad seed (2%) and foreign matter (2%) are within the limits and moisture-free (not more than 10%). Inferior quality material fetches a lesser price. Once a farmer accepts the price, the entire produce is weighed on a large, automated scale instead of a manual scale. It is important to note that the presence of the Sanchalak is not compulsory during the procurement process, but usually Sanchalak comes to the Hub to gain trust of the farmers. In the absence of the Sanchalak the estimated quote is given directly to the farmer. During the peak season, procurement of the produce may take about 24 hours. The material handling systems at the ITC collection center ensures that tractors, trolleys, or trucks can directly unload the produce without spilling any grain, and a modern weighbridge ensures precise weighing.

2.7 Field Study

Parbhani district of Maharashtra State is selected for the field study as major non-state ICT initiative has been operating since a decade effectively. Three villages namely Asola, Nandgaon bk, and Malsonna are selected for the study. These villages are located within a radius of 30 km from the district headquarter. The major reason behind selecting these villages is that a majority of the farmers from in these villages is utilizing the private ICT based agricultural extension services. In Asola there are 160 households belonging Nomadic Tribe whereas Nandhgav (120 households) and Malsonna (100 households) are dominated by the Maratha caste. The major irrigation source of Asola village is canal irrigation while the major irrigation

sources of Nandhgav and Malsonna are bore wells and canal. The size of land holdings is medium, semi-medium, small and marginal. The major crops grown here are soya bean, cotton, sugar cane, wheat, tur, jowar etc. 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 percent) respondents from SC, BC and NT are also included in the study.

Table 1. Caste wise distribution of respondents

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

2.8 Landholding Pattern among 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 percent of the respondents own less than five acres of land. About five percent of the respondents include farmers belonging to the large farmers' category (see Table 2). Caste wise distribution of land among respondents, as presented in Table 3, suggests that about 67 percent respondents belong to OC category who own more than five acres of land each, whereas a large majority of the SC and NT farmers (84 percent and 72 percent respectively) own less than five acres each. Out of 31 SC farmer respondents 17 (55 percent) are marginal farmers. One respondent belonging to the NT category reported owning more than 25 acres of land. Data also reveals that the majority (59 percent) of the total land holdings is marginal and small.

The agricultural lands in the villages of Parbhani district where data were collected are irrigated by canals or by bore wells. Large parts of this region

have hard rock aquifers with limestone, basalt and other rock formation 15 to 20 feet below ground level. Data reveals that the majority (93 out of 120, about 78 percent) of the respondent farmers has irrigated land (through bore wells and canals). Table 4 on the distribution of land, both irrigated and rainfed along caste lines reveals that the majority (about 88 percent) of the upper caste farmer respondents has irrigated land holdings. It may also be observed that the majority of the NT farmer respondents (92 percent) has irrigated land. However, in the case of scheduled caste farmers a majority of them (about 52 percent) has dry land where rainfed cultivation is practiced. Data reveals that out of 27 farmers who own dry land among the respondents about 59 percent belong to the scheduled castes. One of the reasons for the large number of scheduled caste farmer respondents owning dry land is that the land given by the government, as part of land distribution to the scheduled caste families, is unsuitable for cultivation. Another reason cited by the respondents is that since they lack the resources to develop the land, for example, by digging a bore well or leveling the land, the land provided by the state has remained unused for a long time.

Table 2. Caste and land holding pattern

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

2.9 Education

Data on the educational profile of the respondents of the Parbhani field site suggests that about 25 percent of the respondents have no formal education. Out of these 25 respondents

22 (88 percent) belong to SC and NT categories. A large majority of the OC farmer respondents is educated beyond secondary school. Table 5 suggests that there is a marked difference in the levels of education along caste lines.

2.10 Age

Data on the age of the respondents as presented in Table 6 reveal that out of 42 OC respondents, sixty nine percent are in the age group of below forty years. Similarly a majority of the respondents from BC castes also belongs to below forty year age group. However, in the case of scheduled castes and nomadic tribe farmer respondents a majority of them (78 percent of SC respondents, 68 percent of NT respondents) is in the age group of above forty years. Significantly, less percentage of respondents in the age group of above forty years are found both among OC and BC castes and below forty years is found in both SC and NT respondents. It may be mentioned that the respondents chosen for the study are selected randomly. Thus, Table 6 helps us to infer the fact that while the socially and economically dominant castes prefer their younger generation to continue agriculture, farmers belonging to SC and NT don't prefer their younger generation in agriculture. This data allows us to infer, although to a limited extent, that agriculture has been remunerative for the dominant caste farmers while those castes which have entered into agriculture late has been unremunerative. Vidharbha region to which the study villages belong to is known for commercial agriculture. Traditionally cotton has been cultivated on commercial lines for a long time. Recently we have witnessed a shift from cotton to soyabean cultivation as cotton has become vulnerable to pest damage and cotton price to market fluctuations. Cotton cultivation, and of late soyabean cultivation has been carried out by farmers belonging to OC and BC castes. However, unable to withstand the risks associated with commercial agriculture, farmers belonging to SC and NT categories prefer their younger generation to migrate to urban centres

Table 3. Caste and land holding pattern

Caste	Number of respondents (%)					
	Marginal	Small	Semi-medium	Medium	Large	Total
OC	9 (21)	5 (12)	13 (31)	10 (24)	5 (12)	42 (100)
BC	7 (32)	6 (27)	5 (23)	4 (18)	0 (0)	22 (100)
SC	17 (55)	9 (29)	4 (13)	1 (3)	0 (0)	31 (100)
NT	10 (40)	8 (32)	4 (16)	2 (8)	1 (4)	25 (100)

Table 4. Caste, land holding pattern and type of land

Caste	No. of respondents (%)										Total
	Irrigated					Dry/rainfed					
	Marginal	Small	Semi-medium	Medium	Large	Total	Marginal	Small	Semi-medium	Total	
OC	9 (24)	3 (8)	10 (27)	10 (27)	5 (14)	37 (100)	0 (0)	2 (40)	3 (60)	5 (100)	42 (100)
BC	6 (34)	4 (22)	4 (22)	4 (22)	0 (0)	18 (100)	1 (25)	2 (50)	1 (25)	4 (100)	22 (100)
SC	7 (47)	3 (20)	4 (27)	1 (6)	0 (0)	15 (100)	10 (63)	6 (37)	0 (0)	16 (100)	31 (100)
NT	10 (43)	6 (26)	4 (17)	2 (9)	1 (5)	23 (100)	0 (0)	2 (100)	0 (0)	2 (100)	25 (100)

Table 5. Caste and Education level among the respondents

Caste	No. of respondents (%)					Total
	No formal education	Primary	Secondary	High school	Above 10 th	
OC	4 (10)	7 (17)	13 (30)	7 (17)	11 (26)	42 (100)
BC	3 (13)	7 (32)	6 (27)	1 (5)	5 (23)	22 (100)
SC	16 (51)	3 (10)	3 (10)	0 (0)	9 (29)	31 (100)
NT	16 (64)	2 (8)	3 (12)	1 (4)	3 (12)	25 (100)

Table 6. Caste and age of the respondents

Caste	No. of respondents (%)					Total
	Below 30 years	31-40 years	41-50 years	51-60 years	Above years 61	
OC	12 (29)	17 (40)	8 (19)	1 (2)	4 (10)	42 (100)
BC	5 (23)	10 (45)	5 (23)	2 (9)	0 (0)	22 (100)
SC	1 (3)	6 (19)	8 (26)	14 (45)	2 (7)	31 (100)
NT	1 (4)	7 (28)	5 (20)	12 (48)	0 (0)	25 (100)

for non-farm work. This was corroborated in the responses of farmers during the in-depth interviews. Significantly, the OC and BC farmers who have been holding their control through electoral politics wish to continue their legacy by encouraging their younger generation in agriculture.

2.11 Accessing Agricultural Information or Advices

Agricultural information needs of farmers in the region have been complex because of the adoption of commercial agriculture. 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 7 fifty three out of 120 farmers have been seeking advices or agricultural information from the Promoter appointed by e-Choupal. However, what is significant in the data presented in Table 7 is that the majority of the OC farmers (52 percent) and NT farmers (80 percent) depend on Promoter for information while the majority of the BC and SC farmers depend on input dealers for information. It is also significant to note that no single respondent reported to have sought information through the Kisan call center set up by the government of India. Also, it is important to note the absence of influence of AO in the agricultural information dissemination as no respondent farmer from the BC, SC and NT reported to have approached him/her for information.

The fact that the presence of e-Choupal in the villages made the officials of agricultural extension lax in the delivery of their duties, assuming that the information needs of the farmers is met by e-Choupal. This was corroborated by the respondents in the interviews with the researcher who observed that e-Choupal presence made the agricultural extension officials nonchalant to the information needs of the farmers. Sociologically speaking, such a phenomenon becomes problematic for the reason 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. On the other hand, in the private extension initiative farmers

are treated as consumers who otherwise are viewed as citizens demanding their rightful from the state under the state extension system.

2.12 Marketing the Produce

Over the decades, many small and marginal farmers have been 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 in many studies 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. Interlinked transactions lead many small and marginal farmers to sell their produce to moneylenders and traders from whom they have taken either inputs on credit or borrowed money for household needs. Small and marginal farmers suffer serious disadvantages in the traditional marketing and distribution. Their smaller outputs, fragmented landholdings and often distant location from major markets deprive small farmers in accessing markets where high prices are offered for their produce.

It is evident that there is a drastic shift in agriculture, i.e. from subsistence farming to commercial farming, which is increasing the marketed surplus and causing a shift towards cultivating high value crops. Even small holdings now increasingly generate a marketable surplus of food grains to be sold at markets. Over a period markets have expanded to reach previously untouched areas, a significant portion of the rural population is exposed to highly volatile commodity price movements, driven by global and local factors.

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 8 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

Table 7. Advice on field problems

Caste	No. of respondents (%)						Total
	Neighbors	AO.	Call centers	Input dealers	Sanchalak	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

Table 8. Marketing the produce

Caste	No. of respondents (%)			Total
	ITC	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)

exploitative. It was said that while the mandi traders pay the amount in installments 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. One of the important observations is that the Promoter encourages all the farmers irrespective of caste to sell their produce at the ITC procurement hub to increase his commission. 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. However, ITC procures specific agricultural produce in which it has global agribusiness interests.

3. CONCLUSION

The findings of the study suggest that the e-Choupal initiative enabled farmers a greater access to the market information. It not only provided information about the nearest markets, but also created alternative market mechanism to the existing exploitative mandis. It is claimed by the farmer respondents that the marketing transactions to e-Choupal are more transparent and speedy. It reduced the wastage of produce while loading and unloading and it also

encouraged majority of the farmers to be a part of the formal market structure. e-Choupal helped farmers to save time and income as the transaction with e-Choupal marketing is speedy. Respondent farmers observed that the transaction costs with e-Choupal marketing are less compared to mandi transactions as the loading and unloading charges at the e-Choupal hub are paid by the ITC company (whose initiative is e-Choupal). In the conventional mandi transactions intermediaries collect the mandi fee and farmers are forced to bear the hamali charges. In the mandi, the transaction time, as farmers observed, is more than 20 hours and more. It has been reported that the e-choupal initiative has a positive effect on the incomes of the farmers where it is functioning because farmers access appropriate information from the village internet kiosks.

The documentation of every stage of transaction with e-Choupal allows more transparency and accountability. e-Choupal has created the scope for questioning and it allows for interaction with the agricultural scientist located in the ITC hub to seek appropriate advices for improving the yields as well as quality. Apart from the market intervention e-Choupal helped farmers in developing the habit of attending and participating in the agricultural meetings where agricultural scientists clarify doubts and give expert advices. It was reported by one of the farmers that e-Choupal changed the perception of farmers towards agriculture from that of

subsistence to entrepreneurial activity. e-Choupal promises to bring efficiency to the supply chain by removing intermediaries and by reducing transaction costs and enabling farmers to make decisions. This service also concentrates on providing the timely and scientific advices to the farmers in order to increase productivity.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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