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Role of Kisan Call Centres in Hill Agriculture

B.R. Sharma, Pratap Singh and Amresh Sharma*

The paper seeks to analyse the role of kisan call centres in terms of coverage and effectiveness in solving the problems of farmers in Himachal Pradesh agriculture. Two different cash crops were selected, namely, apple – a fruit crop and tomato – a vegetable crop grown in high hills and mid-hills of the state respectively. The study is based on the primary data collected from the selected 200 farm households – 100 for apple crop and 100 for tomato crop of Shimla and Solan districts of Himachal Pradesh state. Out of these 100 house holds in each cluster village 50 house holds are progressive and used the services of the kisan call centre and the remaining 50 households did not use this facility. For the tomato crop the selection pattern of households was the same. The study reveals that total calls recorded from August 2008 to June 2010 are 44723 out of which Mandi district of the state took the highest 7150 calls followed by 6000 calls and 5100 calls by the Kangra and Hamirpur district, respectively. The farmers showed interest of the call for different problems related to agriculture. Out of the farmers' calls recorded by the kisan call centres for the different crops, calls recorded were the highest for vegetable growers of 11,500 followed by foodgrain growers, fruit growers of 9300 and 7500 calls respectively. The highest calls were recorded for the different diseases in agriculture, animal husbandry, etc, i.e., it was 23.5 per cent calls recorded for the diseases whereas it was 6.90 per cent calls for animal husbandry to the total calls. The study further revealed that farmers who utilised the facility of kisan call centre benefited more with this awareness producing more in the case of both the crops. The productivity in the case of apple was higher on the progressive farms at the rate of 140 qtls per hectare as compared to 85.36 qtls per hectare on the less progressive farms. A similar trend was observed for the tomato crop also. On the progressive farms the productivity was 260 qtl as compared to 236 qtl per hectare on the less progressive farms. It shows that kisan call centre are spreading more and more knowledge and farmer can grow more efficiently and more scientifically their crops. There is need to educate farmers more and more by the media and departmental activities.

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Role of ICT in the Agriculture Sector in India

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In the context of globalisation and growing pressure for marketing efficiency of agricultural commodities, the use of computers and interest in trading has achieved immense significance. This paper encapsulates the status of information communication technology (ICT) and agriculture in India, e-business stand for Indian agricultural market and challenges as well as strategies for adoption of e-commerce in agribusiness sector in India. Internet technology has provided the possibility for cost reduction and demand enhancement along the food supply chain through the use of e-trading. E-trading markets are expected to be more transparent and more perfectly competitive than physical markets, conditions that should attract more consumers and thus increase demand. The primary objective of ICT is to offer the farmers of India all the information, products and services they need to enhance farm productivity, realisation of higher farm output prices and reduction in transaction costs. The use of technology has been playing a key role in many strategies initiatives where attempts have been made to capitalise the benefits of e-business to strengthen consumer and supplier relationships and hence to establish new markets. Agribusiness organisations have capitalised on the many advantages of e-business to improve the marketing of their products. The high reliance on accurate and timely information and large physical distances between producers and consumers in this country has made this sector responsive to the benefits of e-business. The modernisation of market information system, lead to the efficiency in the markets and increased participation of the farmers. It is recommended that in drought-prone and less endowed areas, future ICT initiatives provide information services such as information on weather forecasting, marketing information, best package of practices for dry land agriculture and rural development programmes. It is suggested that participatory and rapid rural appraisals are carried out to ascertain what information the farmers need. In the process, the farmers' self-fulfilling faith in the information services provided should be enhanced. It is further recommended that the farmers be instructed on how to get the best possible benefits out of the services provided.

Market Intelligence- An ICT Based Knowledge Management System

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Market Intelligence is knowledge based management system which may be defined as a process primarily based on market information collected over a period of

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time. An analysis based on past information helps to take decision about the future. Market integration and price transmission, the two important components of market intelligence are discussed in this study with the following objectives: to examine (i) the extent of market integration and Error Correction Coefficients of price transmission and (ii) the behaviour of agricultural commodities to facilitate all the stakeholders. The study of vertical and horizontal cointegration between wholesale and retail price of gram in the selected markets of Bhopal, Chittoor, Delhi and Ganganagar was carried out for the period from January 2001 to February 2011. The prevailing large difference between wholesale and retail price of gram in the important markets in the country indicated delayed or lack of information flow and not following the market efficiency criterion. The two statistical tests, i.e, Trace test and Eigen value statistics indicated that there existed cointegrating vectors and cointegrating equations which confirms a long run relationship in the gram markets under study. The study thus revealed that gram markets in the country are distorted and not following the market efficiency criterion. The value of error correction coefficient γ was found to be significantly higher (the speed of price adjustment) in Chittoor and Bhopal markets as compared to Ganganagar and Delhi markets. The value of long run multiplier suggest that the equilibrium between wholesale and retail price of gram in Chittoor market takes minimum time of 4 days, of 7 days in Bhopal, 49 days in Ganganagar and 63 days in Delhi market to attain the equilibrium level between wholesale and retail prices.

Information and Communication Technology for Agricultural Development in India: An Integrated Approach

Deepak Shah[†]

Recognising the integrative and service delivery potential of the information and communication technology (ICT) with profound impetus to the productive activity, the study not only addresses issues relating to the applications of ICT for economic change in the agricultural sector of India but it also identifies the past and present major ICT initiatives in agriculture, the factors responsible for the success of ICT services and the elements of an appropriate framework for assessing the impact of ICT on agricultural development. The introduction, implementation, application and adoption of ICT services are essential for sustainable growth and development of agricultural sector of India. The desired higher growth in agricultural sector can be achieved only when there is proper application of ICT with adequate investments from both public and private sectors. There is a great scope to implement ICT in order to communicate and integrate the entire agri-food supply chain as in the case of e-choupal in Madhya Pradesh and ikisan, Kisan Call Centers (KCCs), Village

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Knowledge Centres (VKCs), The Gyandoot Project, AGMARKNET, etc. in the rest of the country. The beneficiaries of ICT in agriculture are not only confined to farmers but also encompass food processing companies and suppliers within the agri-food sector. The tools of ICT applications have the potential to provide networking of agriculture sector within the country and globally, apart from bringing farmers, researchers, scientists and administrators under one umbrella. Although providing access to the new technology to the majority would impose a large financial burden, the more difficult task is to prepare the disconnected to develop the competence to participate in the emerging digital economy. The new technologies developed through ICT initiatives can help surmount barriers prevailing at present in providing access to information resources at a low cost and will make its applications feasible as well as profitable. The application of ICT solutions for the development of rural India will surely open up a vast range of possibilities to majority of the population living in rural settings to cross the digital divide to obtain access to information resources and services provided by ICT. Considering government as a large enterprise, it is observed that there are high continuity and change forces operating in the agriculture sector. The e-governance strategy for the agriculture sector should, therefore, be capable of exhibiting strategic flexibility to simultaneously integrate the opposing forces.

Performance of Kisan Call Centre: A Case Study of Kisan Call Centre of Indian Society of Agribusiness Professionals Bhopal (Madhya Pradesh)

R.S. Chouhan, Dushyant Kumar and H.O. Sharma*

An attempt is made to study the per month call received, analyse the discipline-wise call received and to identify the constraints in the adoption of answers received by the respondents in Kisan Call Centre (KCC) of Indian Society of Agribusiness Professionals Bhopal. A KCC of Indian Society of Agribusiness Professionals Bhopal has been selected in terms of the total calls received in the year 2010-11 from Bhopal district of Madhya Pradesh. Fifty respondents have been selected and the study is based on both primary and secondary data. The study revealed that there were 13539 calls received per month by the KCC out of which the maximum calls was related to agriculture followed by horticulture, others and livestock. Among the different districts of Madhya Pradesh the maximum calls to the total calls received by KCC were found to be received from Shivpuri followed by Shajapur, Rajgarh, Sagar, Datia, Chatterpur, Tikamgarh, Ujjain, Betul, Chhindwara, Vidisha, Dewas, Mandasaur and Khargon. Among the calls received from the agriculture sector the maximum was found to be related to plant protection followed by production techniques, marketing of farm production, high-yielding variety seeds, weather forecasting and

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others. The farmers had not followed the recommendations or solutions due to communication gap as experts used scientific vocabulary in the solution, lack of education, solution being far different from the local farming practice, lack of co-operation from agricultural department, difficulty in the adoption of recommended inputs due to non-availability of the recommended inputs in local market, calls are rarely received by the call centre and high cost of recommendation. Hence it is suggested that the recommendation must be tuned with local language, local farming system, availability of inputs in the local market and lower expenditure.

Effect of IT on Job Opportunities to Social Science Graduates in State Agricultural Universities- A Case Study of University of Agricultural Sciences, Dharwad

A.R.S. Bhat, B.M. Khadi and P.M. Salimath[†]

One of the missions of the University of Agricultural Sciences (UAS), Dharwad is to impart higher education in agriculture and allied sciences for creating and developing human resources for overall agricultural development of the country in general, and state in particular. An attempt is made in the paper to throw light on the admission pattern of post-graduate studies in agricultural field at UAS, Dharwad. About 175 students seek admissions every year to various departments of agricultural faculty apart from 25 per cent of students selected through JRF examination of ICAR, New Delhi. Considering the number of applications received for seeking admission to various departments in agricultural faculty for the last six years, the trend in opting for post graduate degree admission was analysed. The results revealed that the percentage of applicants increased over the years for the social sciences group while a decreasing trend was noticed for biological subjects. The number of applicants per seat was maximum in the case of agricultural economics and statistics. This change may be because of job opportunities in the information and technology sector for statisticians and economists. All of the statistics students secure job soon after they finish their master degree. The social science students are best suited for data analyst job, as they have given a remarkable performance. It clearly indicates that rapid growth in IT sector is directly responsible for significant increase in demand for social science discipline.

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An Analysis on Extent of Usage of ICT Tools – Touch Screen Kiosks through IAMWARM Project Among the Farmers of Villupuram District

K.R. Jahanmohan, B.J. Pandian and S. Chellamuthu*

In the technology revolution scenario, usage of ICT in agriculture among the farming community can be effected through farmers' friendly approach. Touch screen technology was opted as the suitable technology owing to the existing educational and technical awareness of farmers in Tamil Nadu. The touch screen kiosks contain a computer with touch screen technology, internet connectivity and are being supported by scientific manpower of the University in the initial phase. Villupuram district is one of the backward districts of the State in terms of socio-economic indicators of the State and hence, that district was purposively selected. The data on the extent of awareness on the usage of computers, agricultural websites, usage pattern and problems in usage of these computers were collected from a sample of 30 farmer-users for which systematic sampling procedure was adopted. Simple percentage analysis and Garret ranking technique were used to draw meaningful inferences. The pre-pilot awareness and usage of computers by the farmers is very meagre. Higher percentage of primary school education and inaccessibility to computers could be the prime reason for such a low level of awareness and usage of computers. The project gave accessibility to computers and training on the usage of websites was given to the beneficiaries which have led to 100 per awareness and usage of computers in the post-pilot phase. TNAU agritech portal was the most preferred site by the farmers for getting information on production, management and plant protection of the crops in their farms. Market price information shared 16 per cent of computer usage and the farmers were more particular on prices of perishables as the selected belt is known for growing vegetables like bhendi and bringal. The ICT user farmers were highly satisfactory in the content and structure of the TNAU agritech portal and existence of vernacular language and more pictorial representation could be reason for the above phenomenon. A similar trend was also noticed in the market information website also. Among the major problems, delay in connectivity mainly due to slow speed of the internet was ranked as the major problem in the usage of ICT tools in agriculture followed by long distance from native villages and non-availability of touch screen kiosks in key villages. The farmers especially primary educated farmers felt it difficult in the initial phase of implementation, hence, it was suggested to design target oriented package for these farmers for further upscaling these kiosks in rural areas. Also, the farmers opined that subsidised prices for internet usage in the rural areas for these broadband kiosks and new technological innovations in the field of ICT should be brought to agriculture to harness the benefits of the ICT in the long run.

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Problems and Prospects of New ICT Interventions in Sugarcane Extension in Uttar Pradesh

A.K. Sharma, R.L. Yadav, D.V. Yadav, Brahm Prakash and M. Singh[†]

The paper has focused on the extension needs of sugarcane growers and an experience of a new ICT based interventions gained by a national research institute, the Indian Institute of Sugarcane Research (IISR), Lucknow. The Institute entered into a memorandum of understanding with the Reuters India Pvt. Ltd., a Thomson Reuters Company (world's leading source of intelligent information with 192 bureau across the world) during 2009 for one year for providing information on various facets of sugarcane cultivation in the form of monthly advisories to the cane growers of Uttar Pradesh. The responsibility of the Reuters was to collect the information from IISR, compile and provide it to its individual subscriber cane growers with customised, localised and personalised cane crop related information (crop advisory), weather forecasts, local crop prices and agricultural news in the form of SMS messages sent to their mobile phones in the local language, besides also using other methods like internet, voice portals, radio, print and television. The approach of the Reuters service was through subscription and the service was available through major mobile networks. Subscription was sold to the cane growers in the form of pre-paid scratched cards in quarterly, half yearly and yearly service packs, sold through agricultural inputs shops, co-operative banks and other rural sales network. The impact of the partnership was observed on three fronts, viz., easy access to customerised content, mobility benefits, and improved convenience and travel saving. The information about the Institute's technologies and other information about sugarcane cultivation and events was quickly disseminated across the Uttar Pradesh very efficiently and in a cost-effective manner to a large number of subscriber-cane growers. The main drawback of the new intervention experienced was the availability of service to the subscribers who were generally large and medium farmers. Most of the marginal farmers were left out. Some difficulties were also experienced in generating monthly crop advisories at the research institute as per the need of the private sector. Due to tuning for conventional methods, the new approach was not very encouraging to the research scientists in the beginning. They gradually picked up interest. The study highlights that agricultural research institutions are not yet tuned to work in a PPP mode on extension and the 12th Five Year Plan need to focus on institutionalising such types of partnerships so that customer oriented services, as per the need of the result-framework document (RFD) – a new initiative of the Central Government may be provided to the farmers.

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Irrigation Information Management through Information and Communication Technology- A Case Study of Command Areas in Karnataka

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The study attempts to assess the accessibility and utilisation of irrigation information in Tungabhadra (TBP) and Upper Krishna (UKP) project command areas in Karnataka during 2008-09. The study revealed that accessibility of irrigation information by engineers at reservoir and canal levels in the irrigation projects was fairly high (80 per cent). Accessibility to reservoir level information like water level in reservoir (Rank I) and withdrawals from reservoir (Rank II) was easily accessible irrigation information, since it was properly documented in electronic form. As a practice, information at different levels of canal such as mains and distributaries is being used in determining water distribution as per the designs. However, at the main canal and distributory level, information needs to be digitalised for easy and quick accessibility by the stakeholders. It was noticed that more than two-thirds of the farmers did not have accessibility to irrigation information at reservoir, canal, distributory and field levels. However, the information on rainfall in catchments (Rank I) was fairly accessible to the farmers as it was disseminated through mass media in TBP. Depending upon rainfall in catchments and water flow into the reservoir, water releases into canals were predicted and accordingly crop planning was done. Farmers at the head region of TBP planned various farm operations based on irrigation information at reservoir level and farmers at the middle and tail regions formulated their farm activities based on information at the main and distributor canal levels. Irrigation information at distributory and field irrigation channels was not accessible to the farmers as it was not disseminated through media due to poor database. It was accessible only through the officials of KNNL/KBJNL and friends and fellow farmers. In order to improve the farm decision making by the farmers especially at middle and tail regions, it is suggested to organise dissemination of information at distributory and FIC level through media like local news papers, television and radio. Taking advantage of revolution in ICT information can also be sent through email or sms. Since the study indicated that farmers' decisions on crop and water management practices depended upon access to crucial information, it is suggested to strengthen irrigation information database and its dissemination to the farming community.

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Performance of ATIC: A Case Study of Chhattisgarh

A.K. Gauraha, S.S. Tuteja, K.N.S. Banafar and M.R. Chandrakar[†]

An attempt has been made in this paper to assess the performance of Agricultural Technology Information Centre (ATIC) in Chhattisgarh. The ATIC has been established in Indira Gandhi Krishi Vidyalaya (IGKV), Raipur, Chhattisgarh in 2000 to provide greater coordination and intensive interaction between the researchers and technology users beyond individual limits of research institutions in controlling towards the dissemination of information. After the establishment of ATIC it started plant sample analysis, advisory services, publications, phone call from farmer, exhibitions. TV show for farmers' on their response to the questions on various aspects like insect pest and disease, varieties and package of practices of different *kharif*, *rabi* and summer crops etc. Thousands of farmers have been visiting the ATIC to understand the different components of transfer of technology. ATIC is actively engaged in receiving the various feedbacks from visiting farmers and extension officials regularly. The appropriate technologies were conveyed to research system and the solutions have been provided to the end users. ATIC suffer with inadequate technical staff and financial resources. A separate staff set up is required for ATIC including technical and administrative staff. A separate policy in university is required for single window system of distribution and sale of various products and publication. Adequate revolving fund of ATIC may be allocated with adequate infrastructural facilities. The purpose of ATIC under SAU system can only be achieved with continuous upgradation of technical capability of technical staff, technologies and support services.

Perks and Irks of ICT in Agricultural Marketing

S. Senthilnathan*

The paper first describes what information technology, its advantages and disadvantages are in general. The major advantages in terms of boosting globalization, quick and widespread communication, low cost means of information dissemination, bridging the cultural gap between countries, enabling business people to devote more time to their work and creating more jobs to computer educated younger workforce were discussed in detail. On the contrary, the disadvantages of ICT inducing unemployment in unskilled or semi-skilled workforce, lack of privacy in sharing information, lack of job security due to privatisation and dynamism in

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software and hardware usage and fear of work culture and English vocabulary of the United States dominating the business and lifestyle world over were highlighted. Application of ICT in research and education in agriculture and its current status are presented. To participate and make informed literacy skills that include the ability to gather, compile and process data. People who use information technology creatively get pioneering careers in agriculture today. Jobs in today's agricultural workforce require greater use of technologies skills than ever before. People must be good communicators and problem solvers, work independently and as members of a team, and to use information technology in an ethical manner. Some initiatives taken by the Government of India to promote ICT in agriculture, concept of rural marketing, its present status in India, role of ICT in rural marketing, creation of portals like e-chauपालs with the help of ICT, using ICT in agricultural marketing, etc., are elaborated. The experiences of scientists on an NAIP project, "Establishing and Networking of Agricultural Market Intelligence Centres in India" with respect to issues in applying ICT in market intelligence preparation and dissemination are explained. Finally some means for more effective application of ICT in agricultural marketing were suggested.

Information Technology Role of Hill Agriculture- A Case Study of Kangra District of Himachal Pradesh

Nitika, D.R Thakur and M.S. Pathania[†]

A study was conducted in one of the most developed blocks, namely, Kangra, (Panchrukhi) in Kangra district of Himachal Pradesh which has maximum number of land holdings (about 22 per cent) and cultivated area (about 21 per cent) of the state to assess the impact of information technology of production and income and possible measures for sustainable development of hill agriculture. Two Panchayats from Panchrukhi block was randomly selected. In the third stage, one representative village was selected randomly from each panchayat. Finally, 40 households were selected for this study. About 41 per cent of the family members fall in the working group of 15-60 years. The literacy rate was 65 per cent in the overall situation. It was higher (84 per cent) in male compared to female (63 per cent). The gross income from different sources was Rs. 99,270 per annum per farm. The highest share of income was noticed from dairy sector followed by agriculture and service sector. It was noticed that the sample households had only one category of land, i.e., cultivated area. The cultivated area was about 11 karnal/ farm indicating the marginal category of farms. The sample farmers reared the cross bred cows for milk purpose. The paddy in *kharif* and wheat in *rabi* season was grown by the farmers. Almost all the area available with the sample farmers were added under improved seed. The added seed

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cost was noted as Rs. 762 and Rs. 782 for paddy and wheat crops, respectively. The source of information received by the farmers for improved variety of seed from different sources varied between 15 to 30 per cent. The sample households treated the 30 kg of seed with fungicide for 0.32 ha of area. There was an increase of 11 per cent in crop production. The study revealed that with the proper application of fertilisers, there was addition in the production of paddy to the tune of 35 per cent, while it was 50 per cent in the case of wheat. It was noted that with proper application of plant protection measures there was increase in the production of paddy to the tune of 40 per cent, while it was 35 per cent in the case of wheat. The households reported that about Rs. 24 and 26 was spent to receive the benefit of technology. The productivity of crops grown by the farmers was increased by 30 to 50 per cent the scientific application of FYM. The farmers received higher net price in distant market. The main sources of information was received by the farmers from news paper for cross-breeding programme of animals followed by fodder cultivation. The non-availability email and computer were the major problems reported by 80 per cent of the households followed by non-availability of proper records regarding market prices, non-availability of TV/radio/mobile/landline phones/magazine and non-availability of I T facilities in R & D institutions etc. The majority of the farmers reported about the benefit of information technology ranging between 60 to 100 per cent.

ICT Application in Agricultural Marketing – A Case of AGMARKNET

M.S. Jairath and Purnima Purohit*

The study attempts to (a) know the ICT initiative in terms of AGMARKNET, its operation and coverage, (b) the linkage and outreach and (c) evaluating usefulness, coverage, information displayed on the portal with particular reference to coverage of commodities, price coverage arrivals in the market and linkages with other relevant sites, (d) knowing the awareness and actual utilisation of data by farmers and traders and offering suggestions for improvement in contents and coverage of information. The study suggests that (a) there is a strong and urgent need to spread its coverage in those markets which are still not covered. This can be done by according high priority to the ICT initiative in the forthcoming Five Year Plans so that more resources are earmarked to give further momentum to this programme; (b) Information coverage on more of the commodities and varieties needs to be included so as to widen the scope of marketing and trading across the borders. Efforts should be made to include allied sector information also so that producer – growers are benefitted; (c) To extend the benefit of this portal to each and every farmer, there is a need to involve and develop alliance with more organisation (both with national and international level having similar mandate) by having public private partnership; (d) More markets have to be

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brought under the ambit of portal by providing the requisite infrastructural and logistic support. All efforts should be made to reduce the gap between installation of computer and market nodes. The rate of connectivity needs to be improved; (e) The study suggests that there is an urgent and strong need to develop and train more manpower to operationalise the installed computers in various markets; (f) The gap between computer connectivity and data reporting needs to be bridged by having mutual dialogue with the states and recognise the reasons to improve the data reporting process. To enhance data reporting by the markets, a scheme for token incentive to the dealing officers should also be brought in; (g) There is a strong need to launch an awareness campaign by involving various institutes and KVKs. Efforts should also be made to involve NGOs/ SHGs for this task; (h) The name of the website/portal could be modified suitably so that producer-growers can easily remember it.

Role of Information and Communication Technology (ICT) in Dissemination of Knowledge in Agricultural Sector---Its Efficacy and Scope

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The paper seeks to explain the role of Information and Communication Technology (ICT) in dissemination of knowledge in agriculture. The role has been assessed in terms of coverage of ICT in agriculture focusing on development of various projects initiated by various governmental and non-governmental organisations, issues and challenges, Research and Development, effectiveness of problem solving and ICT initiatives. The paper is confined to two sections. The role played by ICT on the basis of secondary data and existing literature is discussed in the first section. Section Two concentrates on the constraints of Kisan Call Centre (KCC) with reference to Telecommunications Consultants India Limited (Information Technology Division) agencies involved in the operation of KCC, its function, list of operational calls, call details etc. Besides accessibility/connectivity issues, agent deployment, nodal agencies together with improvements/suggestions etc. have been dealt with using an unstructured interview method.

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