ICT Can Facilitate CSR Initiatives: Need Assessment Survey and Analysis of Remote Villages in India

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Abstract: **- Availability of natural resources is not planned by the humans. However, they have always generated the need for creating effective measures of utilizing the natural resources for the benefit of mankind. One category of natural resource is the fossil fuel and renewable sources like water, wind and solar which is an integral component of the Power sector companies.**

Power companies have established their Power Generation plants close to the availability of the natural resources. Gujarat State Electricity Corporation Limited (GSECL), the Power Generation arm of the Public Sector Company Gujarat Urja Vikas Nigam Ltd., has built a thermal and a hydro power plant in Ukai, Gujarat. This has resulted in displacing villagers from at least 8 villages. These villagers, mostly tribal, have moved to nearby locations in search of their livelihood.

This paper has documented the need assessment survey carried out by the authors on parameters such as sources of income, skill development, availability of food, water and shelter, transportation, education, healthcare and sanitation of the displaced villagers near Ukai power plants. Data collected has been analyzed using qualitative and quantitative techniques. The authors have suggested from their findings specific CSR initiatives that can be undertaken with the effective use of Information and Communication Technology (ICT). These would be in line with measures adopted by developed villages like Punsari in India for empowering and improving the quality of life of the villagers.

I. INTRODUCTION

The Ukai Thermal and Hydro Power Plants have been setup by GSECL on the banks of the River Tapi. The GSECL Township at Ukai, Gujarat is about 6 kms from the Maharashtra border. Paddy, sugarcane and bamboo are grown in plenty as the agricultural crop by the nearby villages. Bamboo goes as raw material to the Paper mill in the vicinity. Most of the villages in the surrounding neighborhoods consist of tribal population,of which significant number have converted to Christianity. It rains well on the hills.

This Need Assessment study has been conducted at UKAI TPS (Thermal Power Station), a remote power plant of GSECL, to facilitate planning certain result oriented measurable CSR activities by GSECL. This study includes understanding and documenting unique characteristics of the villages adjoining the UKAI TPS and hence suggesting their development opportunities using ICT (Information and Communication Technology) along the lines of PUNSARI village, the model village of Gujarat.

Why is it necessary?

UKAI TPS was established from 1976 till 2014 in phase manner. It has the capacity of generating electricity of 1350 MW Coal based thermal (TPS) + 300MW Hydro (HPS) which is supplied to Gujarat Grid. However, it has also resulted in displacing the villagers from the locations that they had lived for several generations. GSECL has felt the need to help improve the life and living conditions of the villagers in the adjoining villages. This would include evaluating the current conditions of Food and Shelter, Water, Health, Sanitation, Transportation, Education, means of livelihood, skill development, communication methods and hence identify areas which could be recommended to GSECL as areas of improvement that can be facilitated using ICT.

What are the expected outcomes of the Need Assessment Study?

To provide a report that details the parameters that have been studied for 15 adjoining villages of Ukai TPS using a structured questionnaire. Further state the areas that can be recommended to GSECL to focus upon for CSR activities using ICT. These areas are an outcome of evaluating the questionnaire responses using qualitative and quantitative methods of analysis.

II. LITERATURE REVIEW

The focus of literature, mainly written in the post liberalization period, is on highlighting potential of vast rural market and providing description of a few cases of commercial organization of rural areas. The literature has uncritically borrowed theories, framework and concept from the mainstream marketing discipline, which has shifted the

growth of the subject as an independent field of academic investigation.

There is an urgent need to build a distinctive perspective and a sound theoretical base for rural marketing, which would create its own concepts, frameworks, theories and body of knowledge. The rural consumer behavior exhibits certain behavior unique to rural settings and this makes it important for marketers to understand rural consumers through appropriate research. Rural consumers, for example, tend to lead a more relaxed lifestyle compared to the urban counterparts and exhibit little urgency. Consumers in rural markets tend to have greater trust in products and services endorsed by the government and its agencies. They tend to be more brand loyal, as habits once formed are difficult to change and they tend to feel a pride in getting a good deal rather than paying premium prices for products and services. An analysis of the content of a number of textbooks written on the subject (for example, Dogra and Ghuman 2008; Gopalswamy 1997; Kashyap and Raut 2006; Krishnamacharyulu and Ramakrishnan 2002;
Rajagopal 1998; Velayudhan 2002) reveals that the meaning of rural market has changed over the past six decades. Kashyap and Raut (2006) have listed three distinct phase in the evolution of rural marketing during which the term change it meaning and connotation.

During the first phase, pre 1960s, rural marketing was synonymous with agricultural marketing.
During 1960s – 1990s the marketing of agriculture input and marketing of non farm rural product was considered as rural marketing.
Post 1990s- With rising income and mushrooming middle class across the country, various companies focused on tapping rural market potential. Rural marketing now refer to FMCG and Consumer durable goods in rural area.
The extent literature on rural marketing has uncritically used the same theories, models, concepts and framework as have been used in the marketing discipline.

Information Technology (I.T.) and rural development:

The goal of using ICT with underprivileged group is not only about overcoming the shortcoming, but rather enforcing and passing the process of social inclusion to the next level, which is required for change of the environment and social system that reproduces scarcity.
I.T. has varied applications in it, through which the development of the rural area can be possible accurately. Government had introduced a number of programs through which the people of rural India can come forward and use the I.T. enabled services and work more systematically. Some of the programs run by the Government are:

• *E-Mitra:* This service is launched by the RAJASTHAN Government for the first time for its rural citizens, so that they can deploy the I.T. enabled benefits to its fullest. E-Mitra is State Government started projects, which soon became highly popular in the region. In year 2002, two projects came into existence namely; Lok Mitra and Jan Mitra.
Where Jan Mitra is an integrated electronic platform through which the citizens of Rajasthan can avail the benefit if getting the desired information regarding any Governmental Department at kiosks which is very near to their doorstep. These Initiative programs of Rajasthan government have not only helped the Government by reducing the burden of attending every call, it hasreduced the waiting time for the service and has lead to provide comfort to the citizens also, as with the inception of this service they can easily get the information required at their doorstep.
Lok Mitra is an urban electronic Governance Project which was launched in Jaipur city in year 2002, which helps the citizens of Jaipur (now other cities also) to pay their bills online (land, Water, Bus Tickets and BSNL) leading the citizen to save the waiting time. This service also ensures people that their money is going directly to the Government and provides a feeling of security related to their bills payment.

• *Community Information Centers:*

The program is designed especially for providing the internet access and I.T. Enabled services to
the citizens through which the interface between the Government and the Citizens can be setup. These centers connect seven northeast states namely; Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. The center helps to gain the connectivity at the time of unsuitable environmental conditions. The centers are commonly termed as CIC which are generally situated at the school, college or any governmental office. People can come for the Internet access, and for accessing the internet, a nominal amount is charged from the people through which the daily expenses of the centers are maintained.

• *Wi-fi Projects:*

One of the wi-fi project under which few villages (of UTTAR PRADESH) are connected to internet is Digital Gangetic Plan (DGP). Through the use of DGP wireless network connectivity is created, this program helped the people residing in villages of India to have the access of internet through which the information on various issues can be collected ad used, at the same time the people living in rural India can be updated with the new technological changes and the innovative changes taking place in the national and the international markets. For instance; Bimari Jankari is a portal through which the information regarding every disease and health related issues is available and Digital Mandi is available as one of the portals where all the information regarding the agricultural commodities are available. This portal provides the information regarding the prices of the commodities and their relative value.

• *Gyandoot:*

It was established in January in year 2000. It is an e-governance based module designed for the rural citizens. The project was initially initiated by the Government of MADHYA PRADESH. Gyandoot caters the need of the villagers by providing the information related to the prevailing rates of the agro-based commodities and the rate of land. Each Gyandoot Info kiosks caters to approximately 15 panchayats and 30 villages. The module is designed with the aim to provide cost effective and sustainable delivery model to the people.

• *e-choupal:*

It is designed especially for the farmers of India. Through e-choupal, farmers who are living in the remote area of the country and cannot manage to have direct contact with the consumer can come forward to have a direct contact. It provides an e-procurement system through which the farmers can access the latest and updated information (local, national and international) related to different farming practices. It provides real time information and customized knowledge to the farmers through which the farmer can take better decisions and can have direct contact with the customer, reducing the amount wasted by moving through the distribution channel of intermediary.
E-choupal has already become the largest initiative among all internet-based interventions in Rural India. E-choupal is present in 36,000 villages through nearly 6,000 kiosks across nine states. ITC (Indian Tobacco Company) is planning to expand the concept of e-choupal further in 15 states of India.

III. METHODOLOGY

From the literature review, we identify that there exists a gap in using ICT as an enabler for rural development. As a first step, we visited the Punsari village, the model village of Gujarat. The goal was to understand the key challenges that led the village Sarparch to work towards developing the village and empowering the villagers to lead a good quality of life. In a conversation with the village Sarpanch and local decision makers, we understood how ICT has been leveraged to attain the following outcomes:

1. In a village population of 6000 people, 98% people are associated with agriculture
2. Development has been done using Government schemes. No external funds or NRI funds used.
3. An RO water purification plant has been setup in 2006. They have establishes a coin based payment system where they charge Rs 4 for 20 litre bottle. Gram panchayat rickshaw is used for delivery of the bottles from house to house. For BPL (below poverty line), a 24/7 water cooler has been setup. Water is sold to neighbouring villages at Rs 15 per 20 litre bottle, resulting in revenue for the Panchayat. Extra water used for car wash and irrigation.
4. In the year 2007-08, drainage line, road and street light was completed. In 2011-12, they have acquired tractors for cleaning dumps and provided free dustbin to every household.
5. ICT has facilitated 140 loud speakers (for morning bhajans to alert tones) which are further connected to mobile phones. All fitting work done by village boys which has created jobs.
6. ICT has facilitated connection of the entire village via Wi-Fi using leased line from a Telecommunication Provider. There are 230 users with mobile and/or laptop connections. There is a minimum charge of Rs 10 per month. This has helped empower youth in looking up information and staying abreast of current happening, using online information to grow their business.
7. ICT has been used by technically educated youth of the village to connect the whole village with CCTV cameras. This has led to better monitoring and discipline in the village.
8. There are 5 schools and 8 aanganwadis where children from nearby villages can come to study.
9. ICT has also facilitated e-learning in Schools along with Navneet Prakashan e-sense in 2010. It costs 1 lakh rupees annually for the service. Additionally the schools have computer labs.
10. ICT has facilitated Biometric attendance system in schools at a cost of approximately Rs 19000.
11. ICT has declared Punsari as e-Gram. All collections are done via electronic mode.
12. Skill development center provides training in computers, electrical wiring, plumbing, motor rewinding, beauty parlor, cloth stitching and embroidery at a cost of Rs 50 per course. A certificate is provided after successful completion of the course. This generates confidence in the people and employability opportunities.
13. There is a plan to create LED village using approximately 420 leds ,which will lead to 50% energy saving.
14. Latest dairy technology has been used to manage cooperative milk collection and processing.
15. Sarpanch reviews the progress of various government schemes every month alongwith the village committee and government officials.

As the next step, we have visited the Ukai TPS. We have used a structured questionnaire to collect responses from villagers across 15 villages. Some of the villages are adjoining to the GSECL Power Plant and some are remotely located. We have observed that the main source of income is either farming or they do labour work in other farms or stone crushing. Tabulation method of frequency count and percentages indicate reasons for these being the main source

of income. Tabulation methods have also been used for attributes such as availability of food to eat twice/thrice a day, their knowledge about nutritious food, availability of water for house hold and drinking, proximity to a doctor, availability of ambulance when required, mode and cost of transportation to nearby towns, drainage in the village, sanitary block in household and availability of electricity. Further pie-chart and column charts have compared tabulation results for schooling and education, skill development centers, dairy centers, and their access to information on new government schemes. Association tests using Correlation method and Logistic Regression have been used to establish the possibility of improvement using the captured data considering the fact that almost every household in each of the 15 villages has at least one cell phone connection.

From the findings, we have identified significant areas of concern where GSECL can help to uplift and empower the villagers. Further, comparing to Punsari, we have identified and recommended to GSECL where ICT can help in improving the quality of life of the villagers.

IV. DATA COLLECTION AND SAMPLE SIZE

15 villages adjoining to the GSECL power plant and remotely located in total have been visited for collecting responses for the survey questionnaire. A 5 point Likert scale has been used for questionnaire where 1 indicates completely agree and 5 indicates completely disagree. Considering the common pattern of income, living conditions and needs across the small clusters of families in different villages that we had interacted with, the responses were collected in groups comprising of young & old male/female members. Atleast two to three interactive discussions were conducted in each village. Across 15 villages, consisting of an average number of 100 families each, 150 samples have been collected. Convenience sampling method has been used. Each response to the questionnaire indicates response from one family. 10% of the total population from each village has been considered. Equal weightage has been given to families above and below the poverty line in the sample set.

V. DATA ANALYSIS

1. *Reason for main source of family income*

It has been observed from the questionnaire responses that the main source of income falls under 2 types: farming or labour. The tabulation result in Figure 1 indicates that 90% of the responders have mentioned distance from city (remote location) and lack of any other skill being reasons for family income source.

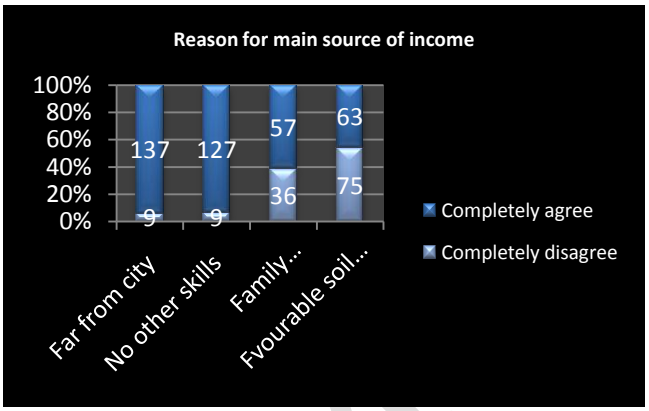


Figure 1

A 2 Step Cluster Analysis has been conducted on the same set of parameters considering Categorical variable as the main source of livelihood either Labour (BPL) or Farmer (APL). The continuous variables are distance from the city, their possessing no other skill, it being their family profession and favourable soil and weather conditions. Main source of income has been used as the evaluation parameter.

Result from Figure 2 indicates that 2 clusters have resulted from 4 variables. It also indicates that the choice of the 4 variable is good.

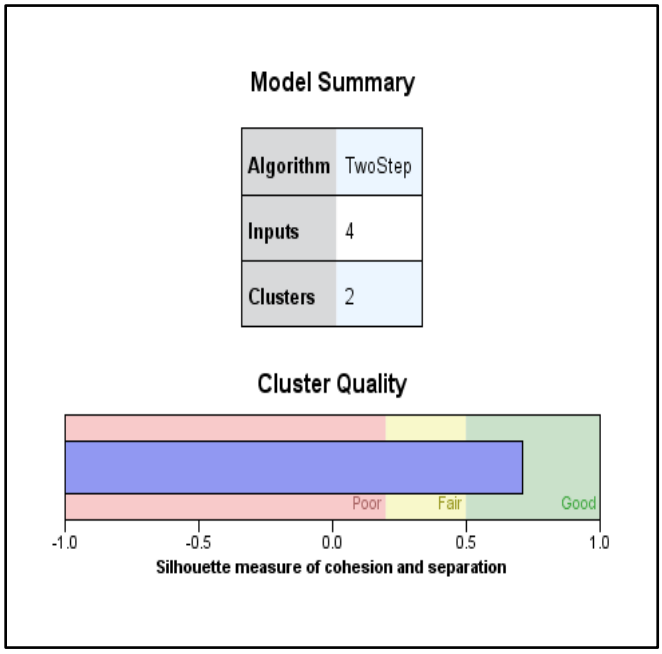
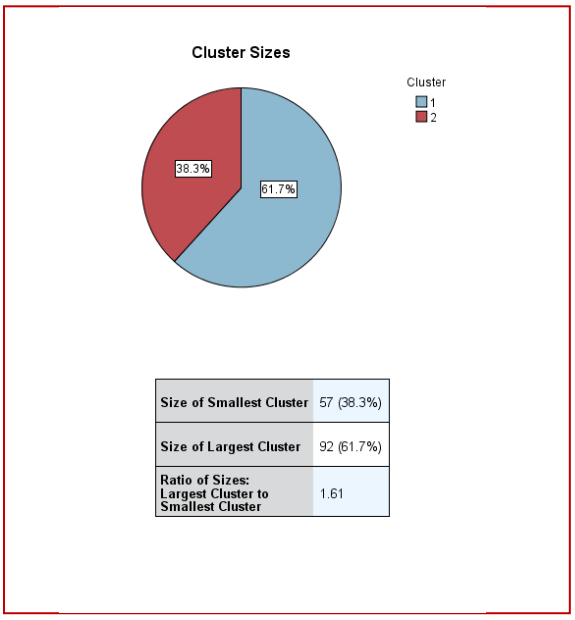


Figure 2

It further indicates that size of the smallest cluster is 57 and the largest is 92 with a ratio of 1.61 which is desirable.



We further observe from Figure 3 that in the first cluster, which is Labourer (BPL), the variable Family profession is centred around 4 (partially disagree) meaning that it is not of much significance, however for second cluster which is Farmer (APL), it is centred around 1 (completely agree) meaning it is relevant and of high significance. Soil and weather conditions are of importance to the Farmer (APL) cluster. However, we note that having no professional skills and distance from city remain a common concern across all villagers.

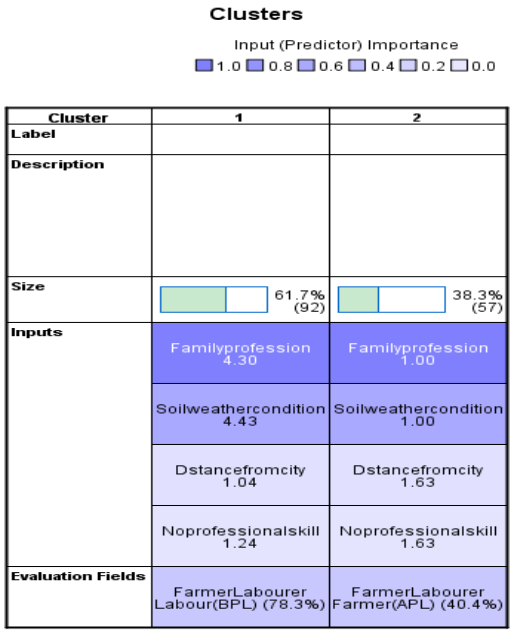


Figure 3

2. Next we have tried to identify if sufficient Food is available for all members of the family to eat meal twice a day. Frequency tabulation and pie-chart Figure 4 indicates that there is sufficient food for the villagers from their income.

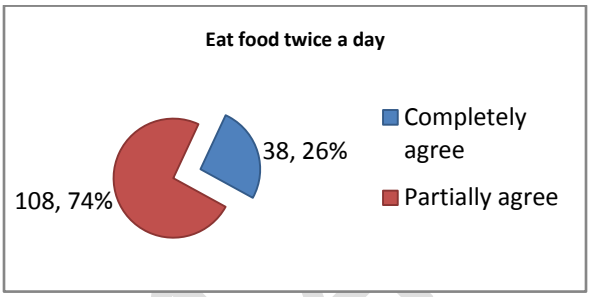


Figure 4

3. However, the response to the question Figure 5 on whether they have Awareness about the nutritious value and health benefits of the food they eat indicates a very poor result. Discussions revealed that their meal consist of rice, dal, chappati and vegetables, primarily from the crop they grow. There is no awareness amongst them to choose and decide upon the food based on their nutritious content, and hence they do not take it into consideration. The pie chart below indicates the responses received from 150 responders. 91% of the responders have completely disagreed that they possess awareness about nutrition in the food they consume.

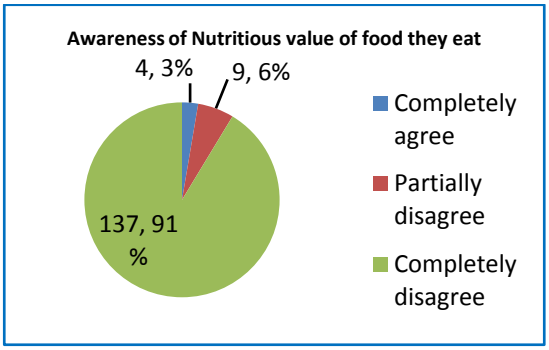


Figure 5

4. The next sets of questions were to identify the Availability of water in the villages. The column chart below compares the water availability on 4 variables: availability of sufficient water for irrigation, for household use, for drinking and whether they have to make a lot of effort for fetching water for drinking. Water is available through tubewells in the villages. From Figure 6,

although more than 50% agree that they get water to drink which appears to be clean visibly, in general quantity of water is insufficient. It was observed during the survey tour of the villages that some of the villages have small water tanks built for conserving and utilizing water for washing clothes and other needs.

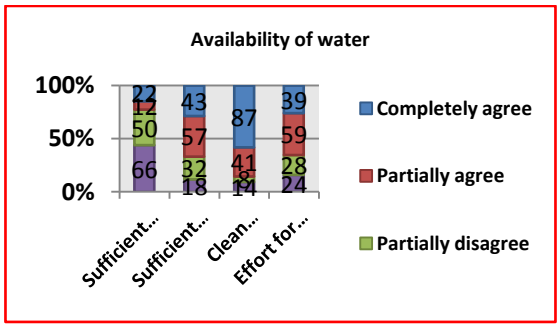


Figure 6

5. The following sets of questions Figure 7 were on Healthcare facilities. Variables used were whether they had access to a doctor in the village, whether they could get medicines when required, whether there is a healthcare centre in the neighbourhood, whether they get low cost healthcare benefits, whether they have attended healthcare camps and if necessary do they get an ambulance. It is observed from the responses and the column chart below, that more than 95% of them agree that an ambulance is available on call. However doctor is not available in the village. ASHA (Accredited Social Health Activists) workers visit the houses and provide medicines. Health awareness camps are not held nor communicated for improving the quality of life.

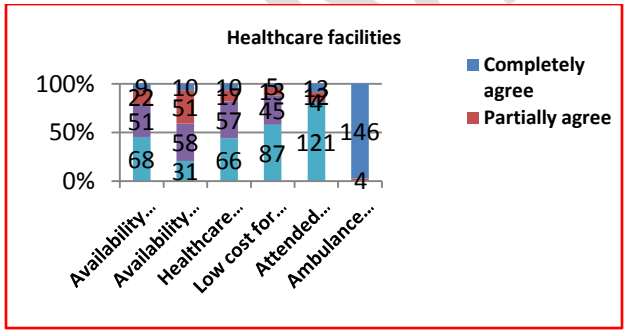


Figure 7

6. The following 2 questions were on what kind of Transportation facilities and access they have to nearby cities like Songadh and Vyara. It appears from the responses that there is good road connectivity from the villages, however it is expensive. Figure 8 indicates that most of them have to take an autorickshaw which costs anywhere between Rs 10 to 25 each way.

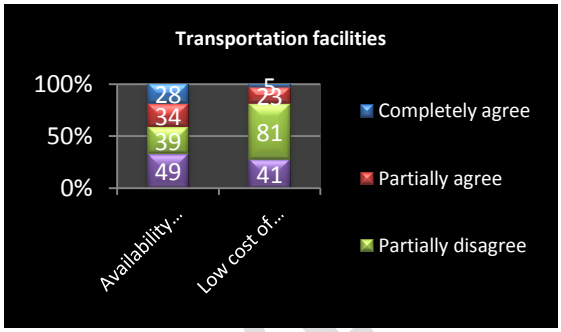


Figure 8

7. Two questions in the questionnaire were to find out how the villagers sell their Products to city and if they receive a fair price for the products. Responses from Figure 9 indicate that in both cases there is a significant number of them who have shown disagreement.

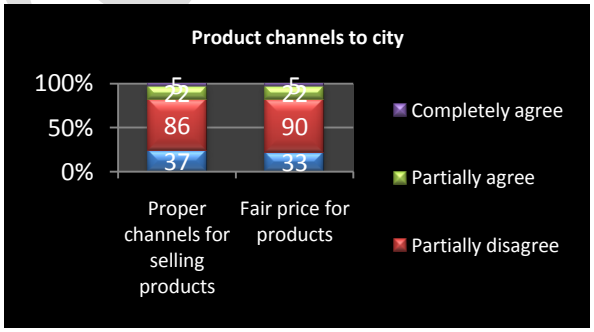


Figure 9

8. An important aspect of evaluation being Sanitation, three questions were asked to identify Sanitation provided in the villages. Responses from Figure 10 indicate that although the villagers make attempt to maintain cleanliness in the villages, basic facilities like proper drainage system in the villages and toilet block in the houses are yet to be accomplished.

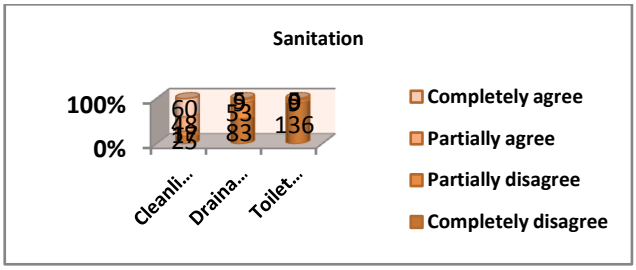


Figure 10

9. Checking on other important facilities such as Electricity and mobile connectivity, responses are very positive. From Figure 11 we conclude that about 80% have responded that they have electricity in their houses and about 90% have mobile connection.

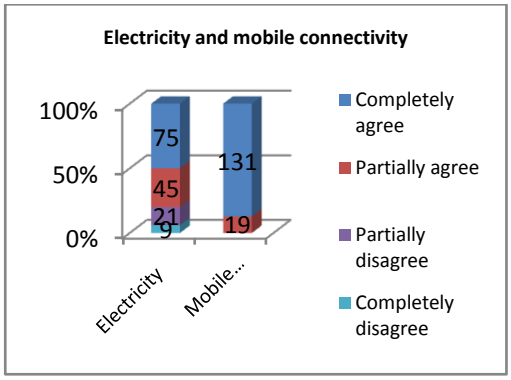


Figure 11

10. Education and skill development opportunities are a matter of concern as we see from Figures 12. Most of the villages have schools till the primary level. After that the children have to travel to nearby towns for education. Lack of trained teachers in the schools is also a concern. The other question indicates that there is very minimal opportunity created for developing any further skills which can generate other forms of employment.

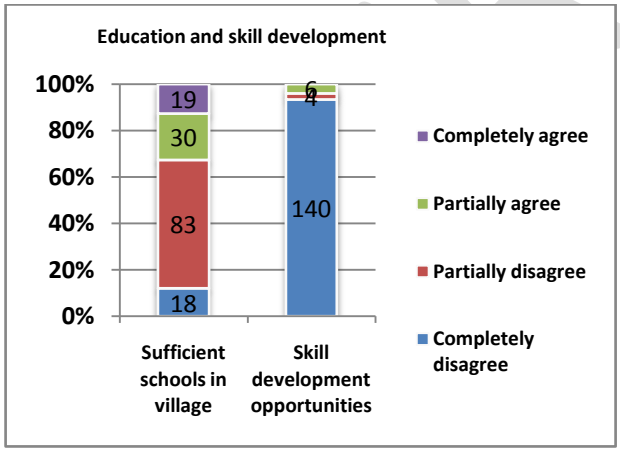


Figure 12

11. Several villagers have cows, buffaloes, ox (for farming), hens as pets. When the pets fall sick, it has been observed that veterinary doctors are available on call as we see from Figure 13. Charge is about Rs 250-300 per visit.

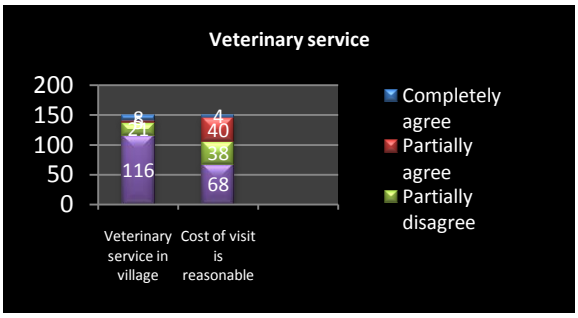


Figure 13

12. We found from Figure 14 that most of the villagers maintained a patch of land to grow food to suffice for their daily needs. The following 3 questions asked on Irrigation needs revealed that there is insufficient use of insecticides and pesticides. Further most of them have not attended krishi melas and neither do they have information on organic farming.

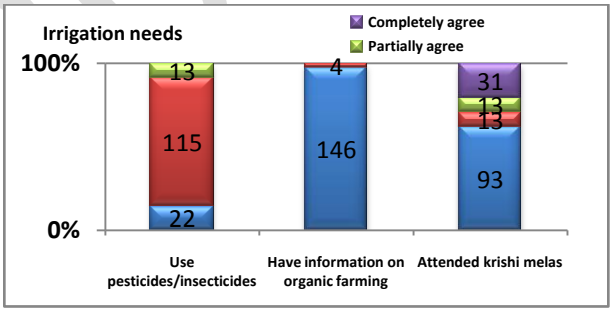


Figure 14

Cluster Analysis and Logistical Regression results

1. It is observed from the Correlation matrix results that there is strong association between the variables: Get sufficient drinking water and get sufficient household water. It is .746 and is significant at .01 level. Further the mean values for both are around 2, means there is partial agreement in both which we have also observed from the tabulation results.

2. The third correlation matrix result states that villagers who feel there is cleanliness in village also believe to some extent that there is proper drainage system in village. It is .423 and significant at .01 level.

3. Correlation result indicate that there is negative correlation significant at .01 level between those who have mobile phones to those who have sanitary block in houses and have attended healthcare camps. There is also negative correlation significant at .05 level with those who

have sufficient household water. However there is no correlation between those who get food twice a day to eat and those who possess mobile phones. This indicates that the acquisition of a technology enabled device for information and communication purpose is irrespective of whether they possess the basic requirements of life.

It is further observed that there is positive correlation significant at .05 between those who have sufficient water for household to those who have attended healthcare camps and have sanitary block in the house. This helps us to conclude that cleanliness drive could be initiated with them.

Logistic Regression

Logistical Regression has been performed considering Dependent variable as "is Having mobile phone", the response to which is Categorical either "Yes" or "No". "Yes" has been documented as "1" and "No" has been documented as "2". There are 5 Independent variables which are "Eat meal twice a day", "Have sufficient water for household", "Have Electricity 24 by 7", "Have sanitary block in the house" and "Have attended healthcare camps".

It is observed from the results of logistical regression that 150 cases have been studied with zero missing cases. The classification table indicates 90.7% correct predictions. All the variables are significant. However this can conclude that since most responses for mobile phone owners is negative on other variables, mobile phones possession is irrespective of basic amenities of life.

FINDINGS AND CONCLUSION

1. The main source of income falls under 2 types: farming or labour. 90% of the responders have mentioned distance from city (remote location) and lack of any other skill being reasons for family income source.
2. Cluster Analysis reveals that in the first cluster, which is Labourer (BPL), the variable Family profession is centred around 4 (partially disagree) meaning that it is not of much significance, however for second cluster which is Farmer (APL), it is centred around 1 (completely agree) meaning of high significance. Soil and weather conditions are of importance to the Farmer (APL) cluster. However, we note that having no professional skills and distance from city remain a common concern across all villagers.
3. Frequency tabulation and pie-chart indicates that there is sufficient food for the villagers from their income. 91% of the responders have completely disagreed that they possess awareness about nutrition in the food they consume.
4. Although more than 50% agree that they get water to drink which appears to be clean visibly, in general quantity of water is insufficient.
5. More than 95% of them agree that an ambulance is available on call. However doctor is not available in the village. ASHA (Accredited Social Health Activists) workers visit the houses and provide medicines. Health awareness camps are not held nor communicated for improving the quality of life.
6. It appears from the responses that there is good road connectivity from the villages, however it is expensive.
7. Responses further indicate that although the villagers make attempt to maintain cleanliness in the villages, basic facilities like proper drainage system in the villages and toilet block in the houses are yet to be accomplished.
8. On the positive side, about 80% have responded that they have electricity in their houses and about 90% have mobile connection.
9. Education and skill development opportunities are a matter of concern. Most of the villages have schools till the primary level. After that the children have to travel to nearby towns for education. Lack of trained teachers in the schools is also a concern. The other question indicates that there is very minimal opportunity created for developing any further skills which can generate other forms of employment.
10. When the pets fall sick, it has been observed that veterinary doctors are available on call. Charge is about Rs 250-300 per visit.
11. Questions asked on Irrigation needs revealed that there is insufficient use of insecticides and pesticides. Further most of them have not attended krishi melas and neither do they have information on organic farming.
12. It is observed from the Correlation matrix results that there is strong association between the variables: Get sufficient drinking water and get sufficient household water. Correlation matrix result also states that villagers who feel there is cleanliness in village also believe to some extent that there is proper drainage system in village.
13. Correlation result indicate that there is negative correlation significant at .01 level between those who have mobile phones to those who have sanitary block in houses and have attended healthcare camps. There is also negative correlation significant at .05 level with those who have sufficient household water. However there is no correlation between those who get food twice a day to eat and those who possess mobile phones. This indicates that the acquisition of a technology enabled device for information and communication

purpose is irrespective of the basic requirements of life.

14. It is further observed that there is positive correlation significant at .05 between those who have sufficient water for household to those who have attended healthcare camps and have sanitary block in their house.
15. It was further observed during the survey that within the village, there is no proper road and lighting. Safety prevails however sometimes animals from nearby jungle are seen in the villages. Villagers use mostly wood for cooking which gets wet during the rainy season, some have gas connections. None use coal for cooking. They brush teeth with either of datun or brush. For irrigation, they most use oxes or take tractors on rent. Some villages have solar panel street lights.

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