5.1 Summary of the findings

In summary of the findings socioeconomic profile of the respondents, their mobile usage pattern, and correlation of mobile communication with various development activities and in earning process are explained. Demographic wise uses of mobile phone in development activities such as in agriculture, marketing, education, health etc. are also explained.

5.1.1 Socio-economic profile of the respondents

In a socioeconomic profile of the respondents, sex ratio, age, occupation/activity, educational status, income and other rights and service they enjoy its are highlighted. The sex ratio of the respondents is dominated by male with 62%. The majority of the respondents is of young age with 66%, followed by middle (24%) and old age (10%). The study has found that respondents engage in different occupations. 24% of the respondents are engaged in self-employed activities, followed by student (21%), cultivator/farmer (19%), labour (15%), house wife (11%) and regular income access group (10%). The economic condition of the respondents is very worse, the majority of them belongs to low income group with 63%, followed by medium (27%) and high income group (10%). Higher level of education is very low among the respondents with 5% only. There are 26% respondents which have the matriculation level of education followed by higher secondary (25%), below matriculate (22%) and graduate (21%). Regarding the family size of respondent the study has found that a majority of the respondents have small family size with 67%, followed by medium (30%) and large family size (3%). There is an evidence of failure in rural housing scheme, the majority of the respondents is still living in cacha house with 83%. Respondents have well maintained their latrine, there are 55% respondents which have latrine with septic tank and 45% of the respondent have latrine without septic tank. Regarding the source of drinking water 41% of the respondents depend on village pond. 33% of the respondents get access to Government supply water and 14% of the respondents depend on well, river, tube well and private paid water.

Remaining 12% of the respondents depend on either pond or Government supply water or from well, river, private paid water etc. for drinking and household purposes. The majority of the respondents is still practicing traditional way of cooking. There are 60% respondents which follow traditional way of cooking i.e., using wood for cooking. 23% of the respondents used LPG for cooking and remaining 17% of the respondents used either LPG or wood or electric cooker or kerosene stove. Road and transportation condition of the rural areas are still worse. There are 25% respondents which get access to good road and transportation, 31% of the respondents get access to either good road or transportation facilities and 44% of the respondents are facing a bad road and transportation facilities. In overall observation the socio-economic status of the respondents is very worse. Villagers are deprived of basic rights and services that are necessary in living. In addition to this economic condition of the villagers are very poor. They engage in different activities/occupation to earn their livelihood. The majority of the villagers are working in un-organized sector. There is less evidence of working under private or public sector organization. Higher level of education is very less among the villagers, educational loans and other assistant are require to encouraging higher studies in rural areas. Road and transportation facilities are also very poor. For development of the rural area infrastructure development and special attention is required.

5.1.2 Media profile of the respondent

Respondents are well accessed to different types of mass media. Penetration of mass media in rural areas is well evidenced from the present study. Radio, TV, newspaper and internet are all get access by the respondents. The study has found that negligible numbers of respondents are not access to any type of mass media and very few respondents (17%) are accessing to only one type of mass media. The majority of the respondents (83%) are access to more than one type of mass media. There are 26% respondents which get access to radio, TV and newspaper, 19% of the respondents get access to radio and TV, 13% of the respondents get access to radio, TV, newspaper and internet, 6% of the respondents get access to TV and newspaper, 5% of the respondents get access to radio, TV and internet, 3% of the respondents get access to TV and internet, 2% of respondents get access to radio and newspaper, and another 2% of respondents get access to TV, newspaper and internet. There are 1% of respondents get access to radio, newspaper and internet and another 1% of respondents get access to radio and internet. Therefore, after observing the media uses habit of respondents the study has found that radio, TV and newspaper are the common form of mass media among the respondents. There are 70% respondents get access to radio, TV and newspaper while 26% of the respondents are getting access to the internet in addition to other type of media. Penetration of internet service is very low among the respondents, while compared to other media. To cope up with the existing system of development process internet facilities in rural areas is need to be improved and rural people are need to give more education on ICT.

5.1.3 Mobile phone usages pattern of respondents

The study has found that mobile phone is not a new phenomenon among the respondents. The majority of the respondents have access to mobile phone service in the early stage of its beginning. However, due to low income, possession of more than one mobile phone in a family is very low. The study has found that 75% respondents are shared with only one mobile phone in a family. Regarding the types of service use by the respondents, voice calling and SMS are very common. Using of the internet and social networking site is very low among the respondents. The mobile phone is widely used for surfing the internet while computer or laptop is hardly used in surfing internet. There is a sign of internet access in every class of respondents belonging to different occupation or activities, with student group has the highest percentage (17%). The highest percentage of respondents are of the opinion that they have high expenditure on mobile phone per month with (35%) followed by the average expenditure (34%) and low expenditure (31%). Despite of this opinion 97% of the respondents consider that mobile phone is not wastage of time & money and 78% respondents consider it as an essential device. Considering the respondents' expenditure on mobile phone and their attitude toward mobile phone, it is found that acceptance of the mobile phone as a means of communication and for development is highly accepted among rural people. Accessing to mobile banking service is very low among the respondents. There are 12% respondents accessing to mobile banking service. In context of rural areas 12% accessing to mobile banking service is of great significance. It is the sign of accepting the application of mobile phone in banking and commercial activities. Respondents are also taking the advantage of mobile phone for participation in radio and TV phone-in-program related to health and agriculture. Therefore, participation of respondents in radio and TV phone-in-program signifies that beside kinship purposes calling, respondents are also using mobile phone for development purposes. There is no evidence of accessing to specially designed mobile application.

5.1.4 Problems faced in using mobile phone

Problem encounter by respondents in using mobile phone is analyzed from various angles such as network problem, recharge problem, electrical problem and other problems like frequent incoming of promotional call or SMS. The study has found that 66% of the respondents are facing either one or two of the problems or all, while 34% respondents is of the opinion that they are not facing any kind of problems in using mobile phones. The problems of network (12%) and electricity (17%) are common problems encounter in rural areas. According to the People's Chronicle report state that in Tamenglong district of Manipur where there is no electricity facilities charging a mobile phone from a portable generators cost Rs 20 for one time charging. In addition to this there are 18% respondents which face both the problems of network and electrical. There are very negligible numbers of respondents claiming that they also encounter other problems like frequent incoming of promotional call or SMS and recharge problems. It is clear from the finding of the study that electrification of the rural areas still needs to be improved. Mobile service providers are also needed more focus on existing rural mobile phone service. Replacing commercial call or SMS by socially important call and SMS will be of great value.

5.1.5 Mobile communication and development activities

Under this heading correlation of mobile communication and different development activities are analyzed. The parameters of development, according to the scope of the study are limited to agriculture, self-employed, education, laborer, health and grass root development service provider. These parameters are framed after analyzing the ground realities of study areas. Correlation of mobile communication and its effectiveness with the parameters of development are analyzed under the following sub-headings. To be more clarity in the findings, demographic correlation and its effectiveness with mobile communication and development activities is also analyzed.

5.1.5.1 Mobile communication and agricultural activities

The study has found that rural farmers are getting benefit of mobile communication in their activities. There are 116 respondents engaged in agricultural activities, of which 42% respondents are of the opinion that they are getting benefit of mobile communication in marketing their product while 18% respondents in marketing and in communication with agri expert or in communication with the officials of agri department. In gender wise observation, there are 62% female respondents getting benefit of mobile communication in their activities in different forms, while 60% male respondents are also of the same opinion. Among the different age category of the respondents there also evidences of effective use of mobile phone in agricultural activities, with middle age (64%) have the highest percentage. Villagers belonging to different educational statuses are effectively utilized mobile communication in agricultural activities with higher secondary (64%) has the highest percentage followed by graduate (63%), below matriculate (61%), matriculate (58%), illiterate and post graduate with 50% each. In family income wise observation respondents belonging to the higher income group have the highest percentage with 71%, followed by medium (64%) and low income (58%). Use of mobile communication in agricultural related activities is highly accepted among the respondents. The demographic correlation of mobile communication and agricultural related activities is well evidenced from the study. Interestingly, respondents are taking benefit of mobile communication through basic service of telecommunication only. There is no evidence of using specially designed mobile application for agriculture and for marketing purposes

5.1.5.2 Mobile communication and labour class respondents

Those respondents whose occupations are mason, carpenter, brick field worker, working on others cultivated land or engage in seasonal jobs are included in labour class.

There are 90 respondents who engaged in such activities, of which 49% respondents are using mobile phones for communicating among co-workers, in searching new avenues of job and in a matter related to the wages of the job etc. In gender wise observation 50% male and 38% female are getting benefit of mobile communication in their activities. There is also evidence of using mobile phone across different age category, with 57% respondents belonging to old age, followed by the young age (53%) and middle age (42%). Among the various educational statuses, respondents belonging to the higher secondary group have the highest percentage in use of mobile communication for labourer activities with 62%, followed by matriculate (56%), graduate (50%) and below matriculate (41%). Villagers belonging to different income groups have used mobile phone for labourer activities. There is no variation of income in use of mobile communication for the said purpose. There are 50% respondents belonging to the medium income group and 49% respondents in low income group who use mobile communication in their earning process. There is no single respondent belonging to a high income group who engaged in labourer activities. The potential of mobile phone in establishing a chain of network is well evidence from the study. Through this chain of network villagers empowers themselves in their daily activities to earn their livelihood. The problems of searching jobs and wastage of time and money are overcome through mobile communication.

5.1.5.3 Mobile communication and self-employed group respondents

Those respondents whose occupation or activities are driver, tailor, barber, weaver, shopkeeper or artisans, etc. are included in self-employed group respondents. There are 147 respondents which fall under this group, of which 23% respondents are getting the benefit of mobile communication in marketing purposes while 20% respondents in taking orders or ordering product or service, and another 24% in both marketing and taking orders or ordering a product or service. In overall 67% respondents get the benefit of mobile communication in their business activities. In gender wise observation, 69% male and 65% female are getting benefit of mobile communication in self-employed activities. Respondents belonging to different age categories have also used mobile communication in self-employed activities. Middle and young age groups are very active in using mobile phone for business activities. There are 73% middle age group followed by 66% young age and 45% old age group. Among the different educational qualification of respondents below matriculate group has the highest percentage in terms of using mobile communication in self-employed activities with 75%, followed by higher secondary with 68%, matriculate with 64% and graduate with 56%. There is no single respondent belonging to an illiterate group while in the post graduate group there is only one respondent and the said respondent is taking the benefit of mobile communication in self-employed activities. Family income wise, the medium income group has the highest percentage in using mobile communication for business purposes with 74%, followed by low income with 63% and high income with 60%. From the findings of the study it is observed that villagers who employed themselves are getting benefit of mobile communication in their earning process. To some extent, the problems of farness and shortage of transportation are mending up through mobile communication and allow villagers to do business in and outside their locality.

5.1.5.4 Mobile communication and education

From the findings of the study it is evidenced that mobile phone is popularly used for educational purposes in rural areas. The majority of the students uses a mobile phone for surfing internet. There are 81% students surfing the internet through mobile phone, 6% through computer/laptop and 13% through computer or laptop or mobile phone. There is also evidenced of using SMS for educational purposes. Due to poor economic condition, possession of a laptop or computer in rural areas is very rare. Mobile phone on the other hand is cheap and easily affordable and has multi-media features. Having such advantages the acceptance rate of mobile phone is high among the rural people.

5.1.5.5 Mobile communication and development service provider

Development service providers are those who engage in implementation of various development schemes design for rural people, such as Pradhan, Member, and other village coordinator etc. They are directly in contact with villagers and are accountable for the development of rural areas in grass root level. This grass root service providers are engaged in rural employment scheme, rural housing scheme, rural sanitation scheme, rural drinking water scheme and in the distribution of PDS item, etc. The study has found that 25% of the respondents through mobile phone communicate to development service provider to access the service or to gain information on those development schemes. In gender wise examination, equal participation of male and female in using mobile phone for development communication is evidenced from the study. In an observation of different age categories, middle age is having the highest percentage in use of mobile phone for communicating with development service provider with 41%, followed by old age group with 30% and young age group with 18%. There is also evidenced of using mobile phone for communicating development service provider among different educational statuses. There are 29% respondents belonging to higher secondary level of education using mobile phone for communicating development service provider followed by post graduate (28%), below matriculate (27%), graduate (22%) and matriculate (20%). Using mobile phones for communicating development service provider is also analyzed from the angle of respondent's family income. The study has found that respondents belonging to different income groups have used mobile phone for accessing to various development activities. There are 40% respondents belonging to the high income group using mobile phone for communicating development service provider followed by low income (23%) and medium income (21%). Employed of mobile phone in development activities are well evidenced from the study. For development or rural areas various schemes are implemented. However, those schemes are barely reaching in the hand of beneficiaries. The study has found that different sections of respondents are taking the advantage of mobile phone in communicating grass root development service provider. If a mobile phone is well utilized in implementing development schemes, the biasness of middle man can be reduced.

5.1.5.6 Mobile communication and Rural Health

The study has found that 31% respondents are using mobile for communicating health service provider, such as ASHA, nurse, doctor, village or district health coordinator, etc. through mobile communication they access to the health service such as on communicable disease and its medication and precautions, about pregnancy cases and immunization of natal etc. Negligible numbers of respondents are accessing to mobile health application known as Mother and Child tracking system. In gender wise observation, the study has found that female is more active than male in using mobile phone for health communication. There are 40% female and 26% male using mobile phone for health communication. In age wise observation, young age has the highest percentage in using mobile phone for health communication with 40%, followed by middle (17%) and old age (6%). Among the various educational statuses, illiterate group has the highest percentage in use of mobile for health communication with 43%, followed by below matriculate with 40%, matriculate with 39%, post graduate with 25%, higher secondary with 24% and graduate with 22%. From the pattern of data presentation it is observed that lower educational groups are more active in mobile for health communication than the higher education group. There is also evidences of positively use of mobile phone for health communication across different income groups of respondents. There are 35% medium income, followed by high income (33%) and low income (29%) using mobile phone for health communication. The acceptance of mobile phone for health communication across different sections of the respondents is evidenced from the study. Through mobile communication they access to basic health services and help to fulfill their basic health needs.

5.2 Conclusion

The study provides a comprehensive analysis of role of mobile communication in rural development of far-flung areas. It is proved with the help of empirical evidences that mobile communication has potential to overcome barriers of distance, odd topography, linguistic and cultural barriers and encouraged people to be on the path of development. The conclusion of the study may be summarized into the following ways-

5.2.1 Development and extension of telecommunication in rural areas

For using mobile communication in the rural development process, existing telecommunication infrastructure of the rural area is necessary to be scrutinized. Good telecommunication service is required for using a mobile phone in the rural development process. Telecommunication in rural areas is growing at a faster pace. The digital divide between rural and urban is narrowing down. The overall rural telephone subscriber base of the nation at the end of March 2015 stood at 419.31 million as against 577.18 million urban subscribers. In the same period rural wireless subscriber base stood at 414.18 million as against 555.71 million urban subscribers. Regarding, wireline subscribers of rural areas in the same period stood at 5.13 million as against 21.47 million urban subscribers. In the context of the northeast telecom circle, excluding Assam and Sikkim, the overall rural teledensity as of December 2011 stood at 37.91% as against 145.51% urban teledensity. During the same period, the wireline rural teledensity of a northeast telecom circle has marked 0.63% as against 5.89% urban teledensity. In case of rural wireless teledensity of northeast during the same period stood at 37.29% as against 139.63% urban teledensity. According to the 2011 census, there are 44,769 villages in the northeast region, excluding Sikkim of which 33,607 villages have 2G coverage while only 1733 villages have 3G coverage. Telecommunication in rural areas of northeast India is still needed to give more attention. Zooming into rural areas of Manipur, according to 2011 census out of the total 609,964 households, 48.9% household of rural areas have telephone or mobile phone facilities as against 74.4% household of urban areas. Out of this total household, 44.7% households in rural areas have only mobile phone facilities as against 67.2% households of urban areas. Regarding internet connections, out of 609,964 households, 10,886 households have internet connection facilities with 3,733 households in rural areas as against 7,153 households of urban areas. There are 13,438 households of schedule cast in rural areas of Manipur of which 6,276 households have mobile phone facilities, 725 households have only landline connection facilities and 193 households have internet connection facilities. In rural areas of Imphal West there are 3,128 households of schedule cast, of which 1,813 households have access to mobile phone, 199 households have landline connections and 67 households have access to internet facilities. Regarding schedule tribes of rural areas, there are 1,52,848 households, of which 51,857 households have mobile phone facilities, 2,103 households have landline connections, and 1,266 households have internet connection facilities. In rural areas of Imphal west there are 853 households of schedule tribes, of which 559 households have mobile phone facilities, 27 households have landline connections, and 36 households have internet facilities. Regarding 2G coverage, according to 2011 census out of total 2547 villages 1937 villages are covered by 2G service while only 209 villages are covered by 3G service. As of December 2015, there are 313 BTS of BSNL are installed in Manipur of which 75 BTS are installed at Imphal West districts. Among the districts highest numbers of BTS are installed in Imphal West district with 28 BTS in rural areas. In Manipur, mobile phone service was initiated by BSNL in 2004. In the first five years of its initiation 25% of the respondents are accessing to mobile phone service. In the second five years of its initiation 53% of the respondents are accessing to mobile phone service. There are 22% respondents newly accessing to the service. In terms of possession of a mobile phone, 25% of all the family members of the respondents have posses one mobile phone each while 75% of the respondents have posses only one mobile phone in a family. Penetration of internet service in rural areas is needed to be improved as there are 26% respondents accessing to internet service. All the mobile service providers operate in Manipur have also extended their service in rural areas. However, the existing quality of the service is still needed to be developed. Special attention from the side of government or service provider is required to enhance rural telecommunication infrastructure.

5.2.2 Pattern of mobile phone usages among villagers

Mobile phone is not a new phenomenon to villagers, the majority of them have access to mobile phone service in the early stage of its initiation. Villagers are well adapted to the basic service of telecommunication i.e., voice calling and SMS. Basic services of telecommunication i.e., voice calling and SMS is very familiar among the villagers. Use of social networking sites, mBanking, and other multi-media facilities of mobile phone are very less among the villagers. The Majority of the villagers is less aware of internet service. However, student community of rural areas has well access to internet service and uses it for educational, entertainment and for communication purposes. Villagers are also using mobile phone for radio/TV phone-in-program. They have positive attitude on mobile phone i.e., mobile phone is not a glamour device and not wastage of time and money. They consider it as an essential tool of communication in their daily activities. Villagers are also using mobile phone to empower themselves in various development activities, in their earning process and to access the rights and service of development. For instance, they use a mobile phone in agriculture, marketing, education, health, and for searching jobs and in communication with grass root development service provider. Understanding mobile phone using behavior of the villagers is crucial for designing and developing mobile application for development activities.

5.2.3 Correlation between mobile communication and rural development

Poor road and transportation facilities, poor infrastructure of health, education, market and biasness in implementing development programs are a few factors which can be mentioned in delaying development of rural areas. Rural people are still deprived of basic rights and service. Taking the advantage of remoteness government agencies is still making excuses for delaying development in rural areas. With the expansion of the telecommunication network in rural areas, particularly mobile phone has changed the scenario of rural development. It becomes a tool of empowerment for villagers engaging in different occupation or activity. Through mobile communication they facilitate themselves in agricultural activities, marketing and business, education, health and in establishing a proper channel of communication with grass root development service provider and in searching job. Villagers who are engaged in agricultural activities have used mobile phone for marketing purposes and in communication with agricultural expert. Similarly, those villagers who are engaged in self-employed activities have also used mobile phone for marketing purposes, taking orders/ordering of product or service that are required in their business.

For those villagers who engaged in labourer activities or migrant workers, mobile phone is a bridge to them. In search of jobs they have to migrate to urban areas and have to travel long distance which cost 10% of his day earning. Through mobile communication they are able to form a chain of communication network, which enable them to communicate with their co-workers, in searching new avenue of job or wage related matters etc. Now they are able to save unnecessary travelling costs and time. This chain of communication network also proved successful in communicating grass root level development service providers, such as Pradhan, members, and other villages or district coordinator, etc. They are engaged in distributing Public Distributing System's items like rice, sugar, kerosene, etc. to villagers and accountable for providing service or information for rural housing scheme, rural sanitation program, rural drinking water, rural employment schemes etc.

Another area where there is application of mobile phone is in rural education sector. In today's education system ICTs becomes a part of teaching and learning process. Possession of ICTs such as computer or laptop is very less among the rural residents. Villagers can't afford such communication gadget. On the other hand, mobile phone is very cheap and has multi-media facilities and can be easily affordable by villagers. Through mobile phone they surf the internet for educational, entertainment and communication purposes. Apart from this, SMS is employed for accessing to employment news, sports news, political news, exam results, etc. Villagers are also using mobile phone for health communication. Through mobile communication they communicate with ASHA, nurse, doctor, village or district health coordinator, etc. However, the villagers are not aware of the ambulance services provided under the National Rural Health Mission which can be accessible through mobile communication. Through mobile communication villagers are able to access timely information or services on communicable diseases, its precautions and medication. Rural woman is able to access the do and don't to be followed during pregnancy and precautions to be taken up for natal, including the schedule of immunization. The application areas of mobile phone for rural development are well observed from the study. Through the basic service of telecommunication villagers empowers themselves in earning process, in accessing the rights and service, in searching job, in education, in health, etc. For strategically used of mobile phone in development purposes initiation of government or NGO or mobile service provider is necessary.

5.2.4 Effectiveness of mobile communication in rural development

The journey of mobile phone in the soil of Manipur has completed ten years. It was introduced in 2004 by BSNL. The journey gain momentum at the end of the decade, when a private sector service provider starts its service in Manipur. During this short period the role played by mobile phone in socio-economic development of the society is remarkable. Specially, in rural area mobile communication has changed the existing landscape of development. With the expansion of mobile communication in rural areas, the mechanism of doing business and earning process has changed. Mobile communication has made a gateway for accessing to various services and rights. Villagers belonging to different demographic have used mobile phone in their occupation or activities or for various purposes. This is evident in agricultural activities where both male and female are using a mobile phone for marketing purposes and for communication with agri expert or for accessing to agricultural loan. Villagers belonging to different age categories, educational status and of different income level have also used mobile phone in the same way to empower their agricultural activities. The acceptance of mobile communication across different demographic is the sign of effectively used of mobile communication in agricultural activities. Another evidence of effectively used of mobile communication is among the villagers engaged in various occupations, such as weavers, artisans, shopkeeper, driver, tailor and holding small scale business etc. In this variety of occupation villagers of different demographic are engaged. They get the benefit of mobile communication in various ways accordingly to the types of occupation. For instance, woman weavers use mobile phone for marketing their produce and in taking orders of the product or in ordering yarn for production. In this process, they are able to save travelling cost and wastage of time and eliminate the involvement of middle man. Similarly, rural artisans also get the benefit of mobile communication in marketing their produce and in taking orders of the product or in ordering raw materials for production. In using mobile phone for empowering and earning purposes, there is no variation of male and female, young and old, illiterate and literate, rich and poor. All the different sections of the society are getting benefit of mobile communication. Among the labourer and migrant workers too, there is evidence of effectively used of mobile communication, gender wise, age wise, educational status wise and income wise. Through mobile communication they are able to communicate with co-workers in searching job or on a new avenue of job or in wage related issues. In the health sector, villagers belonging to both genders effectively use mobile communication for health communication. There is also evidence of effectively used of mobile communication across various age groups, educational status and among different income level. In communication with government machinery, mobile communication plays an effective role. Villagers use mobile communication to get access to the development services and to get information on newly implement development program. Both male and female villagers use mobile communication for communicating government machinery to get access to developmental services. Villagers belonging to different age groups, educational status and different income level have also used mobile communication for communicating with government machinery. Such as, to get access to items distributed under PDS and to get access to information or facilities for rural housing scheme, rural sanitation program, rural employment, rural drinking water scheme, etc. In education sector too, mobile communication plays an effective role. Among the villagers who surf the internet, majority of them use mobile phone for internet surfing. The student community of the rural area is mostly getting benefit from mobile communication in terms of using the internet. They use internet through mobile phone for educational related activities such as for searching study material or for a project or assignment or for exam related activities. They are also using social networking site and e-mail for subscribing e-journal, newspaper, magazine etc and for entertainment purposes. Mobile communication also facilitates them in searching new educational institute for further study. They also subscribe SMS related to job news, sports news, political news, exam result, etc.

5.3 Suggestion

(A) Suggestion for better utilization of mobile communication for rural development

(i) Awareness should be made among the villagers about the potentiality of mobile application in rural development.

(ii) Should identify and develop the available mobile technology in rural areas and the mobile usage pattern of the villagers.

(iii) Government, stakeholders, mobile service provider etc. should initiate and develop mobile application focus on various aspect of rural development and the needs of villagers.

(iv) Participation of villagers should be encouraged while designing mobile application for rural development.

(v) In designing mobile application it should be made user friendly and should consult rural development service provider. For example, in designing mobile application for agriculture, agricultural expert should be deal about the features of the service to be provided.

(vi) To overcome the problem of illiteracy the application should have the features of voice calling at low cost.

(vi) Local language should be included in designing mobile application for rural development.

(B) Suggestion for better utilization of mobile communication in governance

(i) Government officials should be train to use strategic mobile application for governance.

(ii) There should be well coordination among the various departments of government while designing mobile application for governance.

(iii) All the government regular service such as processing of documents should be made accessible through mobile application to liberate location constraint and for saving time and travelling cost.

(iv) All the development scheme taken up by the government should have specially design mobile application in which villagers can access to the service in their door step.

(v) Mobile application base monitoring system for every rural development scheme initiated by the government should be made available to all the villagers.

(vi) Government to Citizen to Government mechanism should be well design for better utilization of mobile communication in governance.

(C) Suggestion for further study and research

(i) Further research can be done on government/stakeholders initiation in use of mobile communication for development.

(ii) Study can be done on generation of income through mobile communication among the farmers of rural areas.

(iii) Study can be done on role of mobile communication in expansion of market for small scale industries, rural artisans, self-help-group etc.

(iv) Study can be done on in designing and developing a mobile application for agriculture, health, education, market etc.

(v) Effectiveness of mobile banking in rural areas can be analyzed.

(vi) Study can be done on role of mobile communication in empowering women and minorities group of the societies.

5.4 A suggestive model for better use of mobile phone for rural development

M4D	**Problems**	**Possible solution**
Agriculture	Lack of knowledge on-(i) uninfected variety of seeds or livestock which can increase productivity (ii) pests and disease (iii) pesticides and fertilizers (iv) new techniques of cultivation, harvesting and rearing of livestock (v) market and price information (vi)	Through especially design mobile application for agriculture using SMS and voice, farmers can get access to information related to agriculture such as on (i) good quality of seeds or livestock which can enhanced productivity (ii) favourable

	weather condition. Besides these, farmers are also facing the problems of irrigation, flood and drought, and storage of their produces. Poor knowledge on agricultural credit and loan provided by government agencies or bias of the government agencies etc.	soil condition for a particular crop (iii) pests and disease fall on crop and livestock (iv) new techniques of cultivation, harvesting and rearing of livestock (v) market and price information (vi) weather condition. Through mobile application government can able to transform their relations with citizens.
Health	Lack of well equipped health institution; absence of Doctor, Nurse ANM etc; villagers have to travel long distance for accessing to primary health services which incur high transportation charge and time consuming; unable to afford costly health service which are available only in urban areas. In addition to these villagers are lack of healthcare awareness and still relying on traditional method of treatment etc.	Through especially design mHealth application villagers can get access to primary healthcare information such as on during different stage of pregnancy, precautions to be taken for natal, about the symptoms of epidemic diseases and precautions to be taken, about preventable communicable diseases and many other more health tips. Moreover, through mHealth a monitoring system for health service provider can also be made.
Education	Lack of educational institution,	Through mEducation a

	no proper school building, negligence of teachers to go to rural areas, lack of teaching aids and infrastructure, poor road, lack of knowledge on educational grant provided by the government and no proper mechanism to monitor rural educational system etc.	monitoring system for educational service provider can be established where villagers can access information about the posting of teacher with full details so that villagers can complaint if the teacher fail to join the particular institute in time, details of teaching aids allot to a particular school and villagers can also monitor attendance of teacher. Student can also get access to information about the various grant provided by government or other funding agency for higher education.
Governance	Less informative about the government development programme, no knowledge on how to get access to the programme, taking lots of time to process a file or document which make the villagers to visit the office frequently and make the villagers to charge high amount of travelling, bias of government agency or middle man, lack of participation of	mGovernance can inform villagers on various rural development programme with details guideline of how to access the service. It can also create an online platform for submission of require document for accessing to the service, which will able to eliminate bias of middle man and will able to save travelling cost. Through mGovernance

	villagers in development programme etc.	opinion of villagers on the existing programme can be gather and suggestion of villagers for further development of the programme can be achieve.
Small scale industries/Rural artisans	Poor space of marketing, poor facilities of transportation of goods, lack of new production technology which can produce the product in large scale, price of the same product high in comparison to other multi-national company, depend on traders for marketing, poor promotion mechanism of government etc.	Through mCommercial villagers can promote their product, they can take order and deliver their product, can identify market demand. This process will eliminate the intrusion of middleman and they can able to sell their product in low price. Through this system loan granted by government or non government agency can be made aware to the rural business doer.
Rural manual workers	Villagers who engage in labour activities have to travel long distance in search of job, hard to find new avenue of job, sometimes they return back without getting any job, lack of communication and coordination among the workers etc.	Through mEmployment a network of communication among the workers can be created where they can share the avenue of job and can negotiate the price of the work. Those who want labour can also update the type of the work and the estimated amount of the work.