A COMMUNITY-DRIVEN INFORMATION SYSTEM TO DEVELOP NEXT GENERATION COLLABORATIVE AND RESPONSIVE RURAL COMMUNITY (NCORE)

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ABSTRACT

Much of the ICT interventions for rural transformation are exogenous in nature (development from outside), in the sense that they use a “push” approach towards development, without considering the nature and problems of an individual member of the rural community. Information and knowledge transactions, especially with dis-empowered people and groups, are a complex process and ICT needs to be appropriated and used in a way that helps resolve daily concerns. With this perspective in mind, this paper proposes NCoRe, an interactive community-driven information system platform to harness the potential of community participation in governance. In a digitally-connected global society, each individual in a community of people is not only a consumer of information but also a producer of information: a potential contributor in many ways to build a better community. NCoRe exploits the potential of community knowledge, making them available to the community and empowering the communities to interact, collaborate and participate in the development of society and transforming the way they live, learn and work. NCoRe is an ongoing initiative to build next-generation collaborative and responsive community by empowering the rural community of India with an ICT-enabled “capability framework” involving the self-help groups (SHG): the micro-communities within a village community.

Keywords—Self Help Group (SHG), Rural community, Interactive information system, Capability framework

1. INTRODUCTION

Large chunks of the population of rural India are marginal farmers, landless laborers, petty traders and rural artisans who are socially and economically backward (including the tribal population). They are faced with problems related to poverty, illiteracy, lack of skills, health care etc. Mainstream institutional efforts are inadequate to provide financial support and livelihood options to the rural masses of India. Also, these are problems that cannot be tackled individually but can be better solved through group efforts. With this objective in mind, small groups are formed within a village with the purpose of solving their common problems. These groups, known as Self-help groups (SHG), are micro-communities (with 10-15 members) within a village community and they have now become the vehicle of change for the poor and marginalized [1, 2]. In other words, Self-help group is a method of organizing the poor people and the marginalized to come together to solve their problems. The SHG method is used by the government, NGOs, and other non-government agencies worldwide.

SHG movement in India involves voluntary association of people (mostly women) in small groups to address their lives and livelihood issues. SHGs in most cases are groups that have been formed by economically and socially deprived a class of the society (particularly women) who have come together to discuss and raise their voice together. Savings and credit activities act as binding forces for them in most cases. However, SHGs have been conceived not just to promote savings and provide credit, but also to act as institutions of change and aid in human development in order to empower its members. They have great potential to address social, gender and women empowerment issues and help to strengthen local governance [1]. In India, there are three major streams through which SHGs have been promoted. The first one is NABARD’s SHG Bank Linkage Program (BLP) and the second one is through the Swarnajayanti Gram Swarojgar Yojana (SGSY), a Self-Employment program launched by the Government of India to promote micro-entrepreneurship and provide sustainable income to poor people. The third stream is through the NGOs. In BLP alone, about 94 million poor villagers, linked with banks through 7.5 Million SHGs, have mobilized an amount of Rs. 33,000 crores (US$5.5 Billion) as savings and issued loans to the tune of Rs 66,000 crores (US$11 Billion) of which Rs 43,000 crores (US$7 Billion) is an outstanding credit mobilized from banks. The poor women of these SHGs in India collectively control the financial business with an annual turnover of Rs 100,000 crores (US$17 Billion), much larger than many multi-national corporations in India [3, 4].

In spite of this huge investment and volume of people involved in upliftment and livelihood enhancement of the rural community, the success is still limited [5]. One of the major problems (discussed in section 3) is a lack of inter-group, group-to-agency (NGO, Bank or Government) and group-to-external world communication and coordination.
For example, agencies are giving money for micro-entrepreneurship development, expecting SHGs to produce goods and services, but they usually do not provide any market linkages. Similarly, agencies are organizing training for SHGs without considering their need and capabilities. Agencies are focusing on frequency of meetings among SHG members and loan repayment issues but pay less attention to their day to day problems. Thus, the entire approach is exogenous in nature (development from outside), in the sense that it uses a “push” approach towards development, without considering the nature and problems of individual SHG. This approach overshadows the endogenous model of development (development from inside) [6] that focus more directly on human beings and their resources and aspirations.

In this context, the power of ICTs can be fully exploited to promote local development. For many remote communities, ICTs are a means for communicating with the outside world. Intelligent use of ICT can improve involvement of everyone in the community, especially young people. It may help to build networking with agencies and help administration with digital documentation for monitoring and evaluation. There are several Government / Non-Government initiatives in India to include ICT in a rural community in general and SHGs in particular. The major focus is to give access to internet connectivity and value-added mobile services. For example, the Common Services Center Scheme has started as a part of the ambitious National e-Governance Plan (NeGP) of Government of India. The Scheme envisages the setting up of 100,000+ IT-enabled access points (internet kiosk) to act as outlets for two basic services – reaching an IT infrastructure to all Indian villages and developing an organizational system for delivering services over this infrastructure employing the profit incentive [7]. The 'EShakti' is another initiative by NABARD, specially designed project for e-bookkeeping of SHG records and related Management Information System (MIS) on a real time basis. This is in tune with the GOI's mission for creating a Digital India. To begin with, two districts viz. Ramgarh (Jharkhand) and Dhule (Maharashtra) are being covered in pilot mode [8].

However, making ICTs available is not enough to ensure that people have access to right kind of information; it is more important that ICTs are appropriated and used in a way that helps resolve daily concerns. With this perspective in mind, this paper proposes NCoRe, an interactive community-driven information system platform to harness the potential of community participation in governance. In a digitally-connected global society, each individual in a community of people is not only a consumer of information but also a producer of information: a potential contributor in many ways to build a better community. They can collaborate for a social mission, participate in local governance, respond to the emergencies, communicate their needs and wants and share their knowledge and expertise to help other underprivileged communities. With this notion, NCoRe offers an interactive platform to exploit the potential of community information and knowledge, making them available to the community and empowering the communities to interact, collaborate and participate in the development of society and transforming the way they live, learn and work. NCoRe is an ongoing initiative to build next-generation collaborative and responsive community by empowering the rural community of India with an ICT-enabled “capability framework” involving the self-help groups (SHG) at the different block, district, and state levels. Currently, it collects data from the target communities through interactive SMS, as internet accessibility and affordability is still a problem in rural India. However, NCoRe can easily be upgraded to the internet-enabled interactive system to build next-generation collaborative and responsive communities.

2. DEVELOPMENT OF RURAL COMMUNITIES THROUGH ICT

ICTs have the potential to make a huge impact on developing countries. Not only can ICTs be used to integrate rural communities into wider economic and social development, but digital technologies can also be used to enhance and preserve the knowledge and culture of rural communities [9]. However, as mentioned earlier, this assertion is derived from an exogenous model of development that underpins many of the interventions aimed at employing ICTs to meet poverty reduction goals. It comprises development from outside and it overshadows the endogenous model of development (development from inside) model that focuses more directly on human beings and their resources and aspirations. [6, 10]

2.1 The Exogenous Model

The exogenous model assumes that the necessary technology (in terms of hardware, software, and services) already exists in the world, as does the considerable experience of its use. Therefore, the development task is to encourage the acquisition and application of the technology, support training of its use and promote the type of regulatory changes, as needed [6]. This assumption is based on traditional theories of modernization, in which technologies are ‘transferred’ from ‘developed’ countries to less developed ones. “The exogenous model (and indeed some versions of the endogenous model), cloaks the interests of investors in the global ‘North’ whose principal ambition is profited from the sale of digital technologies and the content that is hosted on or circulated through them” [10]. An interesting recent example is Facebook’s Free Basics, where Facebook offers free internet access to users only for a few selected sites including Facebook.

It is beyond doubt that through this approach, quite a few significant developments have taken place. ICTs are acquired and used; telecommunication infrastructures are improved and the cost has decreased; connections to the outside world are made. There are significant progress in several countries like Africa, Sri Lanka, Thailand, Bangladesh, India and several South-East Asian and east European countries in the domain of 1) agriculture and health 2) infrastructure, communication, and community
investments [9, 11].

However, ICT interventions for rural transformation are more than just making people “literate” in ICT and making it accessible. Björn-Sören Gigler shows [12] that there is a gap between information and communications technologies (ICTs) and socio-economic development. In this paper, he has shown that, if information is critical to development, then ICTs, as a means of sharing information, are not simply a connection between people, but a link in the chain of the development process itself. ICTs can enhance the functioning of markets because it can properly integrate and bind the floating market components into static contents in order to provide a sustainable model.

Much of the ‘ICT promise’ for rural transformation has been expressed in terms of the power of information and knowledge. However, information and knowledge transactions, especially with dis-empowered people and groups, are a complex process. It is generally not amenable to across-the-counter productization and monetization. Only some kinds of information – like agriculture price information, health related information, etc. can be delivered usefully through a rural kiosk-based model. Most other information and knowledge transactions are much more human interaction intensive and require to be done in an altruistic and community-minded spirit [7]. A simple example is a poor destitute woman seeking help against domestic violence. There is no digital platform for her using which she can seek help and get advisory support from the external world.

2.2 The Endogenous Model

The endogenous approach is based on an understanding that the most important impact related to ICTs and their use are caused not by the technology, but by the new forms of informational behavior they facilitate. These new behaviors enable new connections to be made, which may offer the potential of new value and transformative change to be created in the social, political, and cultural spheres, as well as in the economic [10].

As concluded in the UNRISD workshop [13]: “it is a serious mistake to assume that they constitute a uniform process globally or share a common destination, rather than a variety of new processes each influencing and being influenced by the society in which they are taking place.” ICT for development, therefore, in this approach is about finding solutions to the informational challenges faced in the process of development. The core developmental challenge here is to make it community driven: encourage and support informational developments within the communities themselves.

2.3 The Digital Divide

Almost three in five of the world’s people are still not connected to the Internet. This digital divide hampers economic and social progress. Broadband markets that price Internet access out of reach for the majority of people are neither socially nor economically efficient. Liberalizing the telecommunications industry is not enough; the state also has to facilitate strategic investments, subsidizing access for underserved communities and implementing effective and transparent regulations, including open access to subsidized infrastructure [14]. In several developing countries, “Free Basics” by Facebook or similar initiatives provide people with access to useful services on their mobile phones for free without data charges. However, in India, these kinds of services are banned to favor net-neutrality. Hence, active participation of all stakeholders in hammering out a concrete plan of action is perhaps the single most important step to move from high prices and low uptake to low prices and high demand [14].

3. PROBLEMS FACED BY SHG

In order to design an information system following an endogenous model of development, we should move towards a more citizen and service-centric approach, beginning with a needs analysis: what are the needs, who for, how to develop solutions, where the services need to be delivered and how they can be accessed. In this context, we have conducted both primary and secondary studies to identify the problems faced by SHGs in order to derive system specification of our NCoRe system.

Our secondary study [15, 16] reveals the following set of problems faced by SHGs in India:

1. Ignorance of Members/Participants: Majority of the group are unaware of the schemes of assistance offered to them. Many are Ignorant about the scheme.
2. Inadequate Training Facilities: The training given to the members of SHGs are inadequate
3. Problems Related to Raw Materials: Normally each SHG procures raw materials individually from the suppliers. They purchase raw materials in smaller quantities and hence they may not be able to enjoy the benefits of large-scale purchase like discount, credit facilities etc. Most of the SHGs are ignorant about the major raw material suppliers and their terms and conditions. All these causes high cost of raw materials.
4. Problems of Marketing: Following are the major problems relating to marketing.
   (a) Lack of sufficient orders.
   (b) Lack of linkage with the marketing agencies.
   (c) Lack of adequate sales promotion measures.
   (d) Lack of permanent market for the products
   (e) Absence of proper brand name.
   (f) Poor/unattractive packing system.
   (g) Poor quality of products due to lack of quality consciousness
   (h) Lack of a well defined and well-knit channel of distribution for marketing
5. Weak Financial Management: The return from the business is not properly managed for further investment due to lack of proper financial planning
6. Low Return: The return on investment is not attractive in certain groups due to inefficient
management, the high cost of production, the absence of quality consciousness etc.

7. **Noncooperative Attitude of the Financial Institutions**: The Financial Institutions do not consider SHGs seriously while providing finance and other help.

8. **Inadequate Support from Line Department**: For obtaining assistance and support, the group members have to approach the line officers, who are not always very co-operative with the SHGs.

To empirically analyze the dynamics of the SHGs, a primary study was conducted in a state in India, namely Tamil Nadu. 100 semi-structured in-depth interviews were conducted in six villages spanning across three districts, over a four month period. The interviews covered the group leaders, the group representatives, and the general group members. Each interview lasted from half an hour to over an hour. To gain insights into the dynamics of the SHGs in order to assess their strengths and weaknesses (and identify possible gaps where ICT can pitch in), specific questions were posed to the members of the group. Additionally, the questions were carefully designed to bring out factors that would impact the performance of the SHGs. The questions were carefully translated to the native language by the author.

Table 1: Analysis of Gaps from Information sharing perspective

<table>
<thead>
<tr>
<th>Themes</th>
<th>Analysis of Gaps in SHG developments from Information sharing perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking and External Links</td>
<td>Limited Inter-Group Interactions; No knowledge about SHGs outside the group’s locality; referential (word of mouth) growth of SHGs; enrollment of new members only through member references</td>
</tr>
<tr>
<td>Market Awareness</td>
<td>Personal selling of group’s products; No knowledge of market outside the locality.</td>
</tr>
<tr>
<td>Supporting Agencies</td>
<td>Low interactions with the NGOs; No knowledge about other supporting agencies; harassment by the banking system</td>
</tr>
<tr>
<td>Government Schemes</td>
<td>Limited knowledge about the benefits of government schemes</td>
</tr>
<tr>
<td>Health</td>
<td>Lack of knowledge about procurement of health insurance; limited awareness about seasonal epidemic diseases</td>
</tr>
<tr>
<td>Miscellaneous findings</td>
<td>Lack of task interdependence within the group; Regular Manual maintenance of multiple record books, which is cumbersome</td>
</tr>
</tbody>
</table>

To bring in objectivity to the data captured through the interviews, they were transcribed and qualitatively analyzed for dominant patterns and themes. Since many of the participants were not able to answer the survey themselves, the person administering the survey read out the questions to the participants on many occasions, who then went on to fill the answers. The responses were used in two ways. Firstly, the average scores of all participants for each module and sub-module were calculated to obtain insights about the dynamics of the SHGs and identify gaps where in ICT could play a role. Additionally, questions for which the responses were very high or very low were filtered out for finer analysis.

Table 1 provides the highlights of the findings from the information sharing perspective. It would help in the analysis of gaps where ICTs could play a role.

4. **NCoRe SYSTEM MODEL**

Based on the above observations, NCoRe (Next Generation Collaborative and Responsive Rural Community) has been designed and developed as an Interactive Community driven Information System that helps the day-to-day functioning of the SHGs, who are acting as micro-communities within a village community. The objectives of NCoRe are to

a. empower SHGs to interact and collaborate among themselves and with other rural development authority’s (sub-clusters, clusters, government agencies, NGOs etc.) to share their problems and search for solutions
b. enable the involvement of SHGs to participate in their local governance
c. support them to access various skill development programs, entrepreneurship training to improve their livelihood
d. guide them to establish market linkage to sell their products, get raw materials and to get financial assistance
e. engage them to form a resilient community for better disaster management

As indicated earlier, in India, apart from infrastructure, a major impediment in Internet usage is still internet costs. In several other developing countries, “Free Basics” by Facebook or similar initiatives provide people with access to useful services on their mobile phones for free without data charges. However, in India, these kinds of services are banned to favor net-neutrality. Still, taking advantage of the fact that cell-phone penetration and SMS usage in India is very high; NCoRe collects data from the target communities (SHGs) through interactive SMS in native language [17, 18] However, NCoRe can easily be upgraded to the internet-enabled interactive system to build next-generation collaborative and responsive communities, transforming the way they live, learn and work. A block diagram of NCore System is shown in fig 1.

NCoRe System collects and collates information from SHGs regarding their needs and wants and connects them electronically to different government and non-government agencies dealing with livelihood enhancement and community well-being programs involving SHGs. NCoRe has the following features:

1. Keep a record of static information of SHGs. This part will be recorded in the system only once on registration of new SHG in the system.
2. The administrative agencies (federation, government agencies) will periodically interact with SHG through NCoRe to know how the SHGs can be supported in different sectors such as the need for vocational training, market linkage, advisory services, etc. Some examples are:

- **Vocational Training**
  i. SHG members will express their need for various livelihood related vocational training and the location specific summary of their needs will be generated by the system
  ii. The agencies will conduct specific topic-based training at suitable time and venue on getting sizeable training demand and advertise that on the system as well as send messages to the members who expressed their interest for the said training

- **Market linkage**
  i. System will interact periodically with SHG members to know if they have any product to sell and the seller can send their product specification, the preferred selling price, quantity and contact details
  ii. Category-wise Product list of sellable items will be displayed along with contact details in the web portal
  iii. Prospective buyers may also register in the web portal for buying specific products along with their location and contact details
  iv. Buyers can check the category wise product list and can contact the seller directly

- **Advisory Service**
  i. Counseling related to
    - Health and hygiene
    - further studies,
    - job oriented studies
    - mental disorder
  ii. Contacts for available Medical support/ rehabilitation centers in nearby areas for drug addicts physically and mentally challenged persons
  iii. Contacts for micro financiers
  iv. Contacts for legal advice
  v. Push messages in mobiles of SHG member regarding health and hygiene in regional language

NCoRe software framework contains four broad modules; i) Manage Collaboration, ii) Manage Response, iii) Manage Reports and iv) Manage Notifications and Contacts which is illustrated in fig 2. The components, responsibilities, and functions of each module are described below.

- **Manage Collaboration** contains four sub-modules; i) Configure community, ii) Configure questionnaire, iii) Manage interaction and iv) Configure User access. Tasks of each sub-module are discussed below.

- **Configure community**: Since basic objective of NCoRe is to empower the community, it is the, therefore, necessary to feed the system with the basic contact details of the members of the community so that system can initiate automatic interaction with the community on different subjects as and when needed.

- **Configure questionnaire**: The questionnaire for interaction with the community is framed in native language and is added to the system through this section. The questionnaire may be divided into multiple subcategories so that community member may choose any category for which he/she is interested in providing information. He will then get multiple choice based questions from selected category only. Interaction with relevant community associated with a particular domain makes it easier to gather meaningful and authentic information of particular category, i.e., community members associated with farming may feel more comfortable to interact on agriculture and farming related matters in his locality than on any other topics. The questionnaire is organized in such a way that next question is picked based on the response to the earlier question on a
particular category. Categories and questions can be changed based on the information need of the user.

- **Manage Interaction:** This module is responsible for the collection of different types of information regarding the regular activities and needs of a community from the community itself. We have used the concept of interactive information crowdsourcing [17, 18] and integrated an interactive SMS system in this module that enables the system to initiate a dialogue with interested members of the community on specific domain selected by the members from a given list of options. Interactive SMS system has a built-in intelligent query manager that automatically selects suitable next question based on the earlier response obtained from the member so that a comprehensive picture about a specific domain can be framed. Currently, topics are categorized as livelihood, health, education, local governance, pre and post disaster situational updates. However, this list may be further augmented based on community need.

**Manage Response** is essentially data processing module that offers functionalities like response validation, location, and topic based aggregation, filtering and summarization of collected responses. Data processing is a multi-step method where data sources are authenticated, data aggregation is done, data duplication and inconsistency are removed and finally topic-specific content analysis and summarization is done.

**Manage Report** is data visualization module with two sub-modules: configure report format and configure report viewer.

- **Configure report format:** This enables the administrator to input user-specific report format in the system as that may differ from user to user.

- **Configure report viewer:** Information is made available to the prospective agencies like cooperatives, village authorities, district headquarters and state Government in their desired format. Each agency may opt to view the report in text format or tabular format or on the Map. User specified viewing options are fed to the system through this section.

**Manage Notifications and Contacts** has three sub-modules: Configure Notification, Push Notification, and Publish advertisements

- **Configure Notification:** Any emergency or administrative notifications are added to the system through this section by the administrator. Since any notification has time bound validity, the system also offers flexibility to withdraw earlier notification if validity is over.

- **Push Notification:** Administrator may push any domain-specific notifications to the relevant section of the community only. Otherwise, mass notifications may be viewed on the web portal or location-based notification SMS may be sent by the system automatically to the desired community. It also includes an advisory service where contacts and information about special needs of a community like, specialized medical treatment, career counseling, higher education and vocational training related queries, exhibition, trade fare related queries are answered and corresponding responses are sent as SMS to the members who raised the query.

- **Publish Advertisement:** A collaborative platform is implemented here that enables community members to establish a link to the market beyond the local boundary. Community members can advertise the details of their manufactured products for getting suitable market links. On the other hand, prospective buyers can publish their contact details and purchase interests in different products manufactured by the community. The location and product-specific buyer and seller details are organized by the system and made available in the Web portal so that buyer and seller can establish a direct selling channel if their interest matches.

5. **A FIELD TRIAL WITH NCoRe**

5.1 Data Collection: Methodology

To test our Information System, a field trial was organized with 100 SHG members at remote villages in the Namkhana region of West Bengal, India. Internet connectivity in this location is very poor and, even if it is available, it is not affordable to the majority of people. Community members are using low-end mobile phones to fulfill their daily communication needs. Establishing Internet-based communication with community members is a big challenge in that place.

To cope with this challenge, we use our Interactive SMS System, which will initiate an automated conversation with the selected SHG members of a community on the specific topic. As discussed in the earlier section, multiple choice based queries are picked up from the topic-specific question set preloaded in the system and automatically sent as SMS to the selected SHG members. The SHG members need to choose the proper option to indicate his answer to that query. As a result, SHG members having a low-end phone can also participate in the interaction and answer the query with single key stroke. Based on the earlier response, query manager module sends the next query to the members to get more in-depth information on a specific topic. From the collected data, our system will be able to identify the basic needs of local communities in terms of i) Market Linkage ii) Training Needs and iii) Advisory Services, etc..

Within this framework, we have investigated key factors that have to be met to enable the underprivileged community to have real and meaningful access to ICTs and allow them to appropriate these technologies as an instrument for their own development. Questions are prepared based upon Reserve Bank of India’s guidelines [19] on National Rural Livelihoods Mission launched by the Ministry of Rural Development, Government of India. A sample set of questions (not exhaustive) is given in
Table 2, which was translated in native language and was used in the form of interactive SMSs during the field study.

Table 2: Sample Questions (translated in native language) used for interactive SMS during the field study

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Question in Category: Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Are you interested to participate in any type of training program organized by NGO / Gram Panchayat?</td>
</tr>
<tr>
<td>a.</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>What type of training programs is suitable for you?</td>
</tr>
<tr>
<td>a.</td>
<td>Agriculture</td>
</tr>
<tr>
<td>3</td>
<td>Do you have access to regular training / workshops?</td>
</tr>
<tr>
<td>a.</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Do you have previous experience in order to create MIP. (Micro Investment Plan)?</td>
</tr>
<tr>
<td>a.</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>How many people from your team want to be associated with this type of training programs?</td>
</tr>
<tr>
<td>a.</td>
<td>Less than 5</td>
</tr>
<tr>
<td>6</td>
<td>From where do you get product development training?</td>
</tr>
<tr>
<td>a.</td>
<td>From block</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Question in Category: Market Linkage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Where do you sell the product?</td>
</tr>
<tr>
<td>a.</td>
<td>City Market</td>
</tr>
<tr>
<td>2</td>
<td>To whom do you sell the product?</td>
</tr>
<tr>
<td>a.</td>
<td>Wholesaler</td>
</tr>
<tr>
<td>3</td>
<td>What is the main problem for selling your products?</td>
</tr>
<tr>
<td>4</td>
<td>How much profit do you earn?</td>
</tr>
<tr>
<td>a.</td>
<td>Good</td>
</tr>
<tr>
<td>5</td>
<td>Did you know the exact market value of your product?</td>
</tr>
<tr>
<td>a.</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>From where, raw materials will be collected?</td>
</tr>
<tr>
<td>a.</td>
<td>Local market</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Question in Category: Advisory / Counseling Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What kind of support do you want?</td>
</tr>
<tr>
<td>a.</td>
<td>Health</td>
</tr>
<tr>
<td>2</td>
<td>What kind of medical-related supports you want?</td>
</tr>
<tr>
<td>3</td>
<td>What kind of advice do you want?</td>
</tr>
<tr>
<td>a.</td>
<td>Job</td>
</tr>
<tr>
<td>4</td>
<td>Need legal assistance?</td>
</tr>
<tr>
<td>a.</td>
<td>Family Violence</td>
</tr>
<tr>
<td>5</td>
<td>Need any type of Vocational Training?</td>
</tr>
<tr>
<td>a.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

5.2. Data Processing

The responses are collated and classified according to different categories to document their day to day needs and wants. These responses form the basic pointers to the respective authorities / agencies to take appropriate actions and orient their services in a more customized fashion. The insights generated in this field trial suggest that NCoRe will be useful both for purposes of effective program development and policy design. It promotes interactions and provides direct connectivity among:

- SHG-to-SHG: sharing knowledge and experiences across SHGs
- SHG-to-Government: making government agencies aware of the needs and wants of SHG in particular and the community at large
- SHG-to-Bank: Enabling banks to identify financial requirements of SHGs before executing formal procedure
- SHG-to-market: Enabling SHG members to get market awareness and market linkage directly bypassing middleman; enabling them to identify sources of raw material procurement and channels for finished product selling
- SHG-to-Advisory Service Provider: enabling the providers to know the needs of SHGs and act accordingly (mediated by NGOs)
- SHG-to-Training Organizations: enabling the providers to know the needs of SHGs and act accordingly (mediated by NGOs)

5.3 Challenges Faced and Possible Solutions

Most of the SHG members are from indigent communities of the village with very low literacy skills. They use only low-end feature phones for calling purposes and are not used to SMS. Additionally, all feature phones do not provide native language support in firmware level. So, we cannot interact with some of them using SMS in the native language. Some members have difficulties in reading native language text also. In future, IVR (Interactive Voice Response) [20] service will be incorporated with NCoRe system, through which NCoRe system will be able to interact with the community members through voices instead of SMS text. In both cases, community training on phone usage will be needed.

Presently, SMS cost in India is high. It is an impediment to communicating with indigent communities through Interactive SMS. At present Toll-free SMS in India is not possible. But, TRAI (Telecom Regulatory Authority of India) issue licenses [21] to some mobile operators for providing MVNO (Mobile Virtual Network Operator) [22] service in the India. Under this technique, toll-free SMS will be possible and senders need not pay for their SMSs. This service will be incorporated with NCoRe in future.

We are also planning to provide a low-cost smart phone to a group of SHGs on a trial basis. This scheme is already implemented in some villages of Tamil Nadu, India. A customized smart phone has been distributed to 4,626 SHGs in the district under NRLM [23] scheme.
6. CONCLUSION

Currently, NCoRe system collects data from the target communities through interactive SMS, as internet accessibility and affordability is still a problem in rural India. However, NCoRe can easily be upgraded to the internet-enabled interactive system to build next-generation collaborative and responsive communities. We are planning to conduct a field trial with 100 SHGs by providing the leader of each SHG a smart phone and free internet connectivity for six months. We will train them so that they can use NCoRe directly (in their native language) as well as perform group chats in a voice as well as text mode in their native language using the WhatsApp-like platform. Eventually, NCoRe will become the digital platform of the SHGs, empowering them to interact, collaborate and participate in the development of the community. We conclude with a recommendation that free/subsidized internet access for selective services is a must to serve the underprivileged in developing countries in order to create a vibrant rural community.

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