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It takes a village: Community based participatory research as a design research tool

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Abstract

Design has transitioned progressively from a consumer-focused discipline to a human-centred one, with a more complex agenda. Design thinking has been successfully deployed as an agent for social change. In this paper, we take a trans-disciplinary approach to social design in remote villages of Uttarakhand, India. Lack of employment opportunities and tough sustenance in the mountainous regions of India has led to mass migration and ghost villages. Recent interventions at the micro-level, born from a participatory approach rather than the top-down structure of government development schemes, have been seen to be more effective in tackling this complex socio-economic issue. Community-based participatory research has been deployed previously in areas like public health and primary education successfully. With this paper, we reflect on the viability of using it to identify areas of effective design intervention, not just to address current issues faced by the residents of remote villages in the Himalayas but also to encourage future social entrepreneurs. We worked in a group of Himalayan villages in collaboration with local government agents as part of a month-long design education module. Design students and development professionals teamed up with residents, using methods like transect walks, socio-cultural mapping of health, water and sanitation, education, leadership, mobility, skill and vulnerability and co-design activities. The analysis led to a deeper understanding of the social structure, education, resource equity, power dynamics, the flow of information, drudgery, vulnerability and potential areas for social entrepreneurs. An iterative model of exploration, analysis, design proposition and refinements were followed to identify challenges faced by residents and areas of possible design intervention.

Keywords: Social design, Rural India, Community-based participatory approach

Introduction

Design has transitioned progressively from a consumer-focused discipline to a human-centred one with a more complex agenda, and design education must follow suit, to equip future designers in the skills needed to address new social challenges and forge novel career paths. In the relatively short span that design has existed as a discipline, it has evolved continuously, changing with societal demands. With this constant evolution, skills for future designers have been debated by both professionals and academics. Design has moved from a profession that celebrates individuality and exclusivity to one that thrives on diversity and co-designing practices (Buchanan, 2001). Design methods have traditionally been human-centred and the transition to co-creation practices is an organic progression. The ability to work collaboratively and contribute meaningfully in trans-disciplinary areas may well define future trajectories in design (Singh et al., 2018; Souleles, 2017).

The purpose of this paper is to study the efficacy of using techniques and tools of Community-Based Participatory Research (CBPR) as a mechanism for information collection and rapport building with participants in design research. Design requires an extensive understanding of the end-user and needs assessment of the user to effectively and efficiently lead the way from brief selection to final deliverables. We employed trans-disciplinary methods to conduct design research to seek and identify opportunities present in Himalayan villages that face mass migration, leading to sparse population and ghost villages.

Government agencies and Non-Government Organisations (NGO's) have been working to provide opportunities and solve issues that will motivate people to stay and encourage reverse migration, but with low success.

The design process that we follow in the project has the defined stages of identifying problems, gathering data, secondary research, making sense of analyzed data, framing the brief, brainstorming ideas and developing a prototype. The objective was to use tools of CBPR in combination with co-design practices to collect exhaustive information for analysis, attempting to identify design interventions that could bring about a positive change in the region.

In this paper, we start by reflecting on social design as practised today, in its many forms, and its relevance to current and future design education. We critique the tourist approach that designers sometimes take, partly due to myopic research methods and reflect on the more comprehensive realities that may emerge from relevant social science methods like community-based participatory research. The next section describes the detailed methodology followed, highlighting the hybridized design and development studies approach. We then discuss the findings and conclusions, reflecting on the potential of using CBPR as a design tool in identifying rural design interventions and ways of taking this research further.

Background

Design thinking and design methods are effectively used in identifying, framing and solving the complex problems assailing large sections of humanity, sometimes termed wicked problems. These complex challenges often do not have a right or wrong solution (Buchanan, 1992) and have inter-linked social, economic, political, environmental and cultural issues at stake. Linear strategies are thus not suited to solve them and design methods have the iterative approach needed, giving rise to social design. Social design has grown from an amorphous set of ideas to a more developed area of research and practice. Threshold concepts of the epistemological dimensions stress ways of thinking and practice over discrete theoretical ideas (Souleles, Ferreira & Savva, 2020). Design based strategies towards social outcomes have been successfully deployed in social sectors like healthcare, poverty alleviation as well as environmental challenges like climate change, population growth and improving the lives of people (Shea, 2012; Thorpe & Gamman, 2011).

Design education and social design

Armstrong et al. (2014) defined Social Design as "activities that espouse various and mostly participatory approaches to researching, generating and delivering outputs towards collective and social aims, rather than pursuing an exclusive focus on consumerist objectives". Historically, designers like Walter Gropius, Victor Papanek, Richard Buchanan, John Thackara, Ezio Manzini and Bruce Mau have engaged with socially useful design and reflected on working for the masses. Bonsiepe (2006) wrote of 'design humanism' where the needs of the excluded majority are addressed as opposed to niche groups of consumers. The exploration into future visions for designers has presented designers as 'brave explorers and activists' (Singh et al., 2018). As per the Social Design Futures Report by the Arts and Humanities Research Council (AHRC, 2014), design activities covered by the umbrella of social design include participatory design or co-design, design activism, critical design and disruptive design. AHRC defines Design for Social Innovation as led by experts who identify, support and develop opportunities for social change. Further, Socially Responsive Design involves a basic understanding of the technical and processual elements of design but deep expertise in a sector while Design Activism involves design interventions that raise political consciousness while implementing design interventions.

AHRC (2014) has identified the immense design capability to create positive social impact through new knowledge co-designed solutions to address contemporary concerns. Their report also captures the gap between the current student skill sets and those required for social design. The report finds that the research agenda in social design is currently dominated by non-academic organisations with a preponderance of problem-solving agendas. Social design research was found to be in service mode, not aiming at building knowledge. Higher education institutions in design have a limited approach so far that needs to build trans-disciplinary pathways for future research. Souleles (2017) posits that subjectivist epistemologies of conventional design education are insufficient to tackle design for social change and need an infusion of user-centred and evidence-based approaches for effective intervention. Social design requires interdisciplinary and multidisciplinary approaches that are essential for social design to deal with complex, multi-layered issues that cannot be addressed by methodology from a single discipline (Souleles et al., 2017). Academics have endeavoured to create a curriculum that caters to the skill sets required to adopt social design. An analysis of courses offered by thirteen (13) prominent design institutes shows a positive trend of increased social, economic, political and environmental concerns in the curriculum (Aryana et al., 2015) with increasing stress on social and humanitarian priorities. An inclusion of participatory methodologies from the social sciences and development studies has benefitted design education.

Participatory approaches

The constructionist paradigm that action research advocates is that knowledge not just describes but also produces the world we want (Bradbury, 2020). Action researchers posit that interventions for social transformation transcend mere facts and figures whose objectivity belies the subjective truths of the real world (Fazey et al., 2018). Action research has been described as a balance of action and reflection, with theory and practice, with stakeholder participation, aimed at reaching viable solutions for vexing issues (Bradbury, 2020). Participatory action research stresses improving living conditions of a community rather than focusing on an artefact driven approach (Cohen et al., 2011). The relation between the participants and the researchers is that of equal engagement with involvement at each stage of the project. Participatory action research seeks to not just discover but to use the discovery to institute social change in a planned manner (Brydon-Miller, 2001; Kindon et al., 2009). It aims not just to deal with the explicit issues of the respective group of people but goes beyond to identify the root causes of the issues at hand.

Development studies use a set of research techniques referred to as Participatory Learning and Action (PLA). Originally called Participatory Rural Appraisal (PRA), it consists of interactive methods for analyses, planning, monitoring and evaluation of social development. In the 1990s, it evolved into PLA (Coghlan and Brydon-Miller, 2014). Some key tools are direct observation, semi-structured interviews and sequences or chains of interviews, focus group discussion, diagramming, mapping and modelling, participatory mapping, social network mapping, transect walk, livelihood analysis, oral histories, group walks, storytelling, portraits etc. Although PRA is an excellent way of ice-breaking for individuals working in new and unknown territories, it has drawn criticism in the welfare sector for various reasons. Mosse (1995) felt that PRA was not very useful for understanding the social dynamics of communities or the reasons why marginalized groups might be excluded from decision-making or project benefits. It was also noted that community leaders could direct PRA towards their aims or attempt to undermine activities that had no obvious benefit to them. Pottier (1997) claimed that whatever the PRA advocates say about relaxed settings, participatory workshops are structured encounters marked by hidden agendas and strategic manoeuvres.

Participatory research started in the 1970s, with stakeholder involvement when objective data-driven research approaches failed (Krueger & King, 1998). There was a shift in power in the research process and

the under-represented and marginalized voices were given a chance to be heard, their voice placed centre stage (Cornwall & Jewkes, 1995). In the field of design, Sanders and Stappers (2008) have characterised participatory design as an approach that questions practices built on hierarchy and control that place authority in the hands of experts. Instead, participatory design promotes egalitarian values where the end-users are empowered and become active and equal partners. Creative agency is shared by the researchers, designers, and the intended end-users. Designers have often been criticized for their 'tourist' approach for a superficial understanding of issues resulting in short-sighted solutions. The participatory approach can help overcome this shortcoming placing the end-users at an equal footing with the designers. Fuad-Luke (2009) praises the process for its diversity and celebration of social networks and communities over hierarchies.

Participatory approaches to social design have been effective in gaining meaningful insights from the field. Community-Based Participatory Research (CBPR), specifically, brings together and involves community members, organizational representatives, researchers, and any other stakeholders in the design process (Israel et al., 1998), to build fundamental knowledge about issues before tackling them.

Studies in Himalayan villages

CBPR requires collaboration at each stage of research, from problem definition, research, analysis, design of intervention and evaluation of interventions. At its core, CBPR is an iterative process of collaborative research, reflection, and action (Wallerstein, 2003). Most of the Himalayan areas of India consist of small towns and villages spread over vast, difficult-to-access terrain. They are primarily classified as rural for development and administrative purposes. Research agendas in the mountainous areas of India have been mostly government-led with some sponsored non-government organisations (NGOs). Early participatory projects in the villages mostly followed PLA and this legacy has continued. In the last two decades, there have been a few studies that used CBPR as a research approach.

We came across Community Based Participatory Approaches in livestock depredation by snow leopards (Jackson & Wangchuk, 2004), in village tourism (Peaty, 2009), in sustainable watershed development (Datta & Virgo, 1998), in public service delivery (Joshi, 2013) and wildlife management of musk deer (Wood, 2008). We did not find any studies or projects that investigated the daily drudgery faced by most villagers in these mountainous areas that have resulted in unchecked mass migration to urban centres in the Gangetic plains and beyond. This is where we position our study and attempt to co-identify and co-solve key issues faced by rural communities.

Methodology

Our primary research objective was to examine CBPR as an effective design tool for Social Design. Within the scope of this study, we attempted to identify possible areas of design intervention to reduce daily drudgery in remote villages of the Himalayan state of Uttarakhand in India. The study was part of a one-month long module called 'Social Design' with sixteen (16) participating design students and two (2) faculty members.

The project was preceded by a pilot study in a relatively smaller semi-rural area of Maldevta near the city of Dehradun. Student researchers explored Maldevta and grouped to conduct transect walks in the area. Transect walks are observatory walks or treks across the countryside and fields to study natural resources, topography, indigenous technology, soil and vegetation, farming practices, and problems and opportunities that are tallied with resource mapping and modelling. Through transect walks, one gets insights and information into the nature and complexity of the existing scenario in a way that the traditional approaches do not provide (Narayanasamy, 2009).

Students worked in groups to collect information on education, gender roles, farming, administration, health services, professions, infrastructure, businesses, livelihoods, recreation, and transportation. Collected data was collated and put in layers in a map that was studied to identify and discuss viable areas that could potentially be investigated and dealt with through a product, system, service, or graphic design.

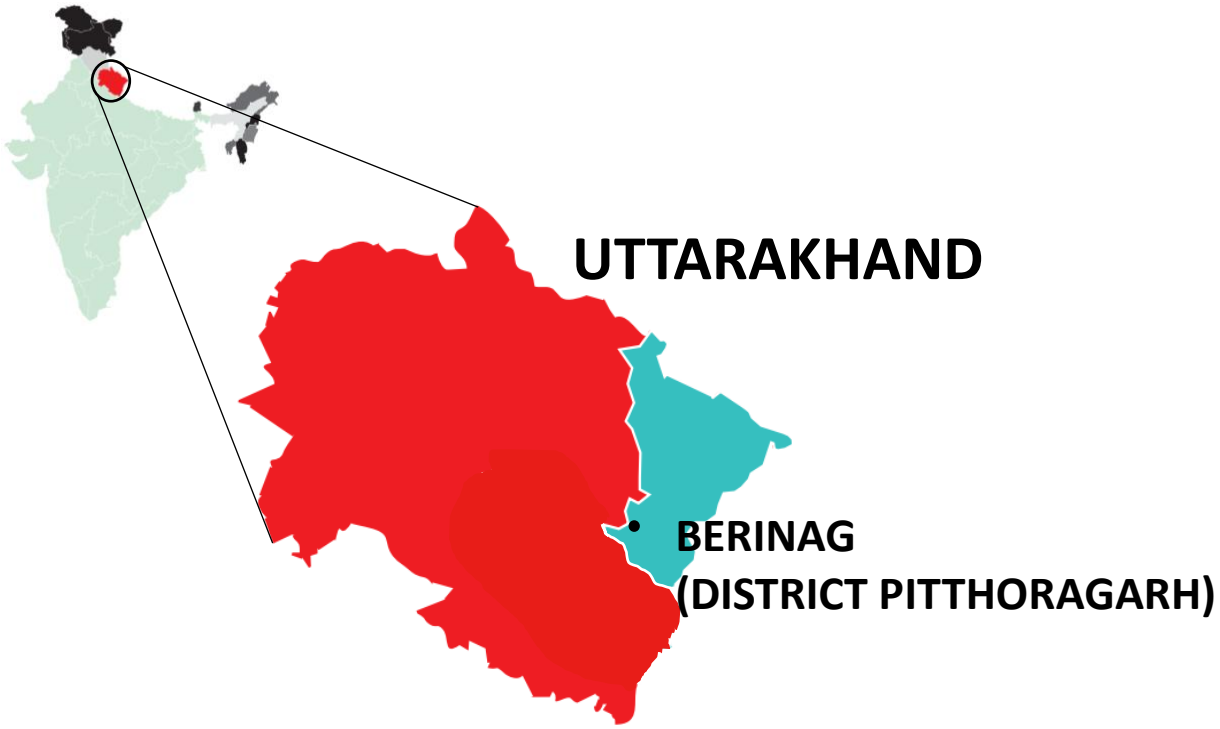

Figure 1: Location of Study Area in India.

The main study was carried out near the Himalayan village of Berinag in Uttarakhand (Figure 1). Out of the many small villages that dotted the area around Berinag, student researchers gathered data from six villages viz, Jabukathal, Tana, Puna, Kalasila, Bajet, and Kaneda. The population of these villages collectively as per the census of 2009 is 683 with a total of 162 households. The villages that have road connectivity are Jabukathal and Bajet and the rest of the villages can only be reached on foot. Basic facilities available in these villages include a common healthcare centre (16 km away, in Berinag), a common panchayat ghar or meeting hall (Kalasila), an anganwadi or child care centre (Kalasila), a primary school (Kalasila) and an intermediate school (Jabukathal). The villages have electricity available in homes, mobile phone connectivity and daily water supply through a pipe. The terrain is mountainous with terraced fields used for farming. Traditionally crops like potatoes, kidney beans, rice and finger millet have been grown in this region. Majority of the population practised agriculture once but this has reduced significantly due to mass migration. Reduction in the cultivation of land is also responsible for increased intrusions by animals like wild boars and monkeys.

The month-long project was conducted from 1 October 2018 to 3 November 2018. Travel to the village was via train, jeeps and then on foot. Due to lack of availability of transportation to these remote areas, travel to and from the villages had to be conducted by privately owned vehicles belonging to the villagers. In the first two days, the student researchers were sensitized to the local climate, people, behaviour and local culture and practices. The main languages spoken by the villagers were Kumaoni and Garhwali, but most of them understood Hindi.

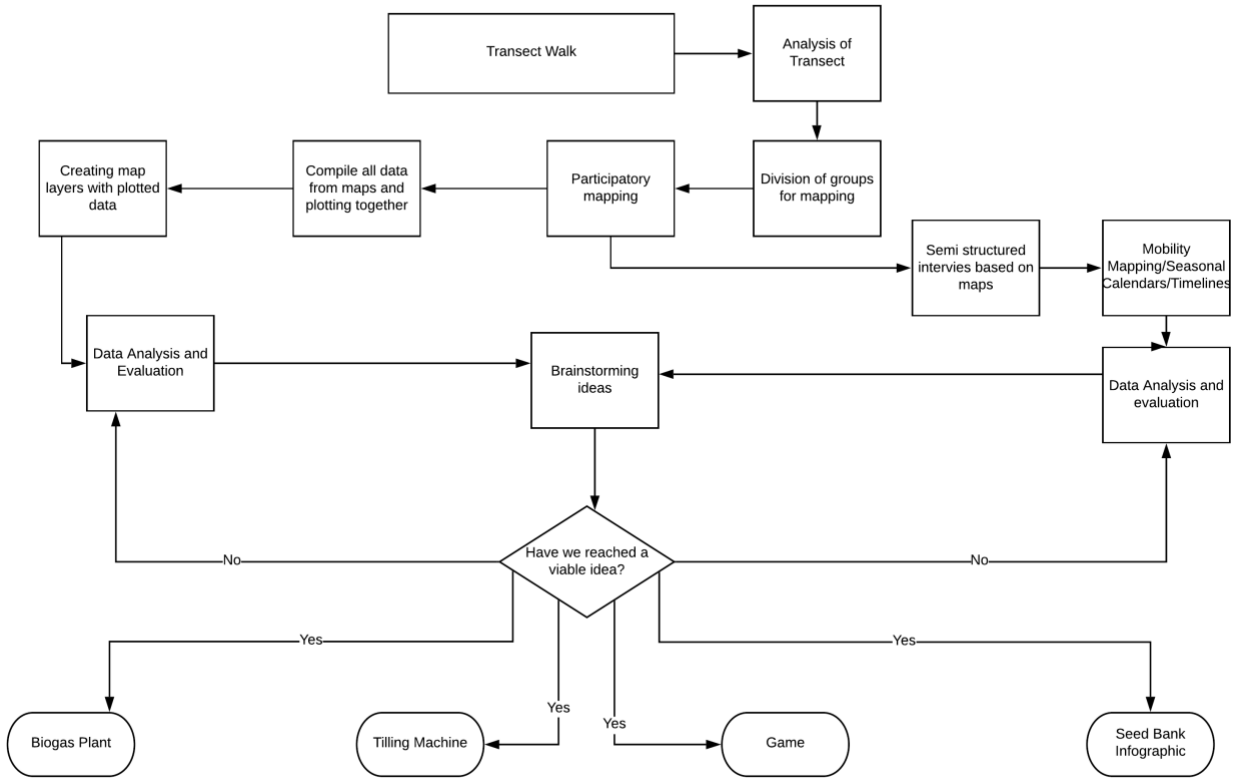

Figure 2: Flow Chart of CBPR Methods Utilized in Design Research.

Student researchers worked in groups and each group conducted structured exercises in participatory mapping and modelling, transect walks, seasonal calendars, timelines, and mobility mapping (Figure 2). Each group was facilitated by a key resident as a guide. Travel between these six villages was on foot due to the absence of motorable roads. The villages were roughly located 3 to 4 kilometres apart and the researchers walked 10-12 kilometres each day on average and covered two villages in a day. Extensive transect walks were followed by discussions and participatory mapping with the villagers to validate the data. Transect walks included a key individual from the village who walks along with the group of researchers elaborating on everything that they encounter on their path including natural resources like ponds, water sources, trees, plantation, terrain and soil (Figure 3).

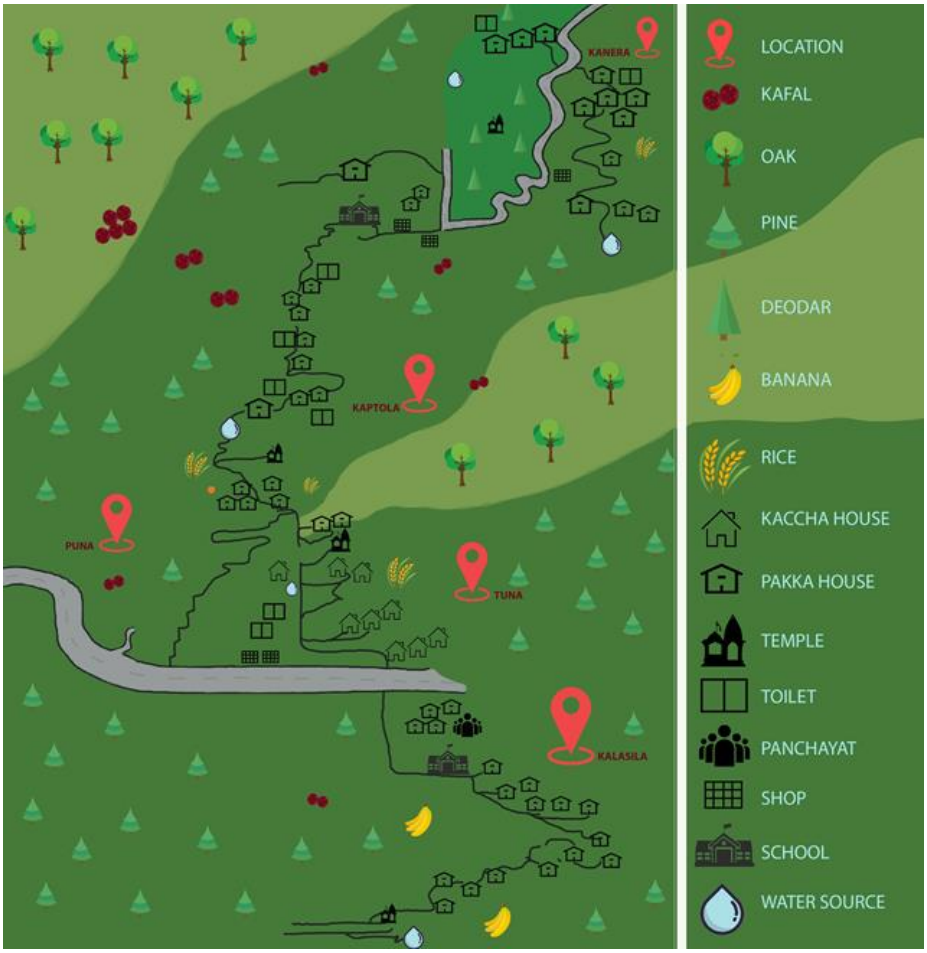

Figure 3: Digitisation of a Transect Walk Recorded during Study.

The village residents cross-verified the transect walks with participatory maps they drew on paper and by utilizing locally available materials like branches, twigs, stones. Participatory mapping included three key individuals from each group: a team leader responsible for overseeing the event and later documenting it, the designated note-taker who recorded important information and any relevant details during the drawing of the maps and the facilitator who introduced mapping, aided the drawing of maps and moderated the process. To keep the process relaxed and spontaneous, discussions and mapping exercises were conducted in natural settings like fields, homes and the panchayat ghar (local meeting hall).

Transect walks from all groups were collated and data gathered from all walks was tabulated and used in creating maps using parameters like population, local and natural resources, type of housing, occupations, livestock, etc. A base map of the general geographic region was then superimposed with layers of these parameters for quick observations and discussions.

Figure 4: Village women drawing mobility maps from memory and lived experience.

Mobility maps were used to explore the movement patterns of individuals in their daily lives and movement and migration patterns of the community (Figure 4). Other relevant tools that were used in data collection included seasonal-calendar, which helped in understanding how seasons affected the livelihood of those with agriculture and other seasonal occupations. It was also used to gain insight into how individual and community practices and behaviour changed with seasons.

Timelines were created and studied to understand key events both in the village and in the lives of individuals. Interview and dialogue formed a part of every interaction. It was a principal tool used in interaction with the school children of the junior and senior schools highlighting both complementary and contrasting perspectives of children and the older population of the village. During transects, mapping, and conversations with the residents of the village, researchers observed and asked questions, listening and discussing in-depth to co-identify problems and uncover opportunities for design intervention.

The participatory exercises also covered local stakeholders from both governmental and non-governmental institutions. Students interacted with the village sarpanch (locally elected head), the members of panchayat (locally elected governing body), school teachers, ashas (government healthcare workers) and local business owners. The research activities and findings were shared among groups and augmented with secondary research from multiple sources over the next week based on which they identified key areas to work upon. These areas were further analyzed to unearth specific problems with probable design solutions. Data collection on the field was analogue as well as digital, using large charts and notebooks, along with digital videos and photographs.

Primary Source of Income	Crops Grown	Food Eaten	Farthest Travel	Cattle Owned
Labourer	Bhatt, Masoor, Wheat	Rice, Pulses, Chapati	Haldwani	4
Insurance Agent	Bhatt, Masoor, Wheat	Rice, Pulses, Chapati	Berinag	3
Labourer	Wheat, Rice	Non-Vegetarian	Berinag	7
Labourer	Wheat, Rice, Polyhouse Vegetables	Rice, Pulses, Chapati	Nearest Hospital	2
Pradhan (Chief)	Pulses, Wheat, Rice	Rice, Pulses, Chapati	Haldwani	6
Labourer	Pulses, Wheat	Rice, Pulses, Chapati	Berinag	2
Small Wheat Mill	Pulses, Wheat	Non-Vegetarian	Haldwani	4
Labourer	Pulses, Wheat, Rice	Non-Vegetarian	Many Places	3
Labourer	Pulses, Wheat	Non-Vegetarian	Bareilly	2
Teacher	Pulses, Wheat	Non-Vegetarian	Char Dham	2

Table 1: Sample Table of Data Collected (Group 1).

All written data were pooled by all groups and digitised and tabulated at the end of each day. A data framework was established to ascertain feasible ideas to reach viable service solutions, prototypes, and materials. All collected data from six villages was tabulated and differences and commonalities noted (Table 1). Information collected was superimposed over participatory maps and analyzed to study and gather areas of interest for each group of students.

Findings and discussion

The test project at Maldevta, which preceded the PRA exercise in the six villages, played a crucial role in ameliorating the apprehensions regarding the mechanisms of conducting the walk. It helped build an understanding of biases like seasonal bias, spatial bias, profession bias and personal biases that may present themselves at times during their visit to the village.

A hands-on experience of biases in rural development tourists was key learning wherein the walk brought to fore the gaps in data gathered via observation and prevailing conditions. A cursory walk that did not reveal much of infrastructure in the village was contrasted with the information obtained directly from villagers about the presence of multiple schools with varied mediums of instruction, a health-care centre, the panchayat house, and a recreation center in the village. By comparing this walk with the study in villages of Berinag, the student researchers were able to distinguish between the variations that were present in the villages based on seasons, topography, population density and facilities.

Impact of transect walks

Transect maps enabled the student researchers to outline the physical research area. Resource transects that were used in obtaining information about village resources and locally available materials brought to fore conversations around ‘naulas’ in these villages. A naula is a shallow man-made tank that is built around a groundwater source to collect water (Figure 5). Diminishing and dried up naulas and conservation efforts and their efficacy was discussed and explored. Reduction in agricultural activities owing to migration resulted in drying up of naulas due to lack of maintenance. Data on migration was also strengthened by studying the mobility of the villagers through mobility maps. Mobility maps were instrumental in studying the daily movement of local people going through their everyday tasks and their commute in and out of the village. Drudgery and effort required in moving through terraced fields were also uncovered. They also highlighted migration patterns and the rate of migration every year. Using these inputs and coupling them

with resource transects, student researchers were able to hypothesize avenues that had the potential to reduce migration.

Figure 5: Naula, a traditional water conservation system to replenish groundwater.

Research on local wealth

Figure 6: A game idea based on recognizing the value of local crops and the challenges to cultivation (Group 2).

Resource transects also played a crucial part in discovering the availability of beneficial Himalayan herbs in the village. Conversations and unstructured interviews supplemented the information of low awareness of the utility and potential marketability of these herbs. The idea of planting information early into the minds of schoolchildren was explored. Channels like custom literature, books, and games to improve knowledge on local flora and fauna interactively were explored. Later as a part of the project a board game to generate interest in farming and impart information on the benefits of herbs like lemongrass, khas (vetiver), oak, amla (Indian Gooseberry) and reetha (Indian soapberry). This was observed by the student researchers as a future entrepreneurial opportunity for the locals. It led to the development of a board game idea for children based on recognizing the value of local crops and the challenges to cultivation (Figure 6).

Designing systems for easy sustenance

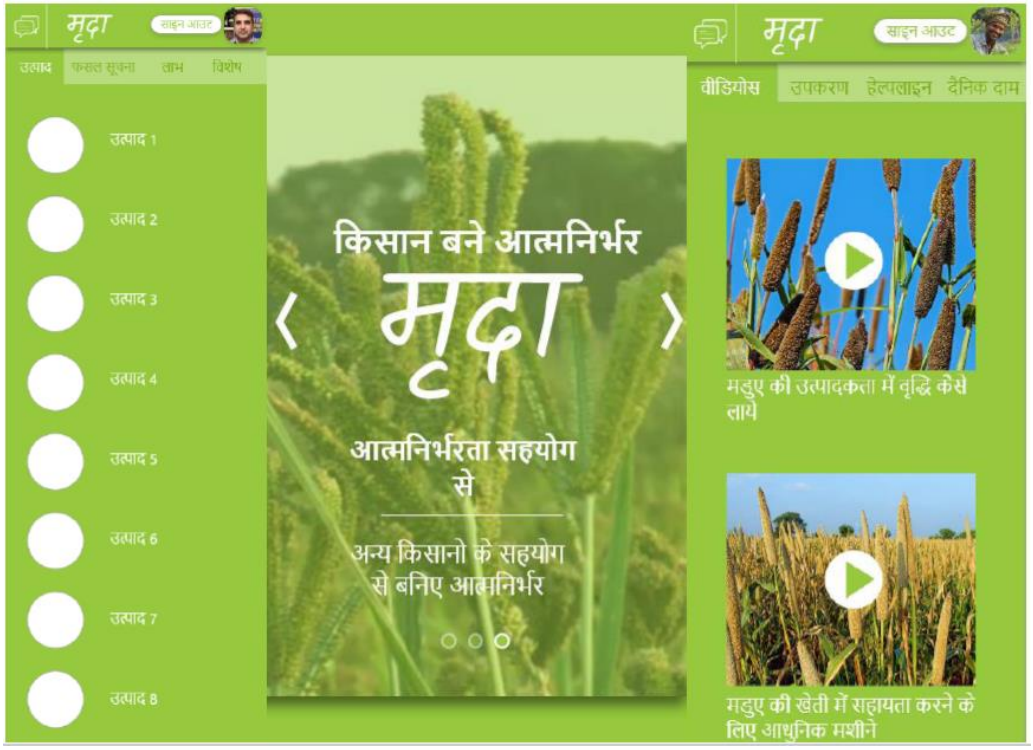

Figure 7: A Hindi Devnagri Script Interface designed to connect local foxtail millet farmers with agricultural experts and buyers (Group 3).

Current farming techniques like sowing and tilling done manually due to unsuitable terrain for mechanized farming presented an opportunity to create lightweight devices to reduce drudgery. Transect walks and participatory mapping in the villages brought forward the painful and lengthy process of sowing maduwa (foxtail millet), the local staple grain. Participatory mapping identified issues like higher costs and lower availability of essential commodities including foods, consumables, and cooking fuel due to no motorable access in the villages. A model that included a government-aided setup where waste from livestock could be used in creating a biogas system to provide cheap fuel and compost was discussed. The system would utilize a lump sum amount from the government and with the fuel and compost it produces, it would cover its cost in a few years. There were also ideas for modification in farming tools for the specific topographical conditions and requirements of popular crops grown there. An Interface designed to connect local foxtail millet farmers with agricultural experts and buyers was prototyped as a solution to several problems being experienced by the millet farmers (Figure 7).

Working with administration

Figure 8: Participatory Exercises with students of local school facilitated by the school administration.

Exercises in plotting personal timelines helped highlight health issues, especially those related to pregnancy and neonatal care by village women. Timelines were able to give insights into challenges in getting good healthcare in these remote villages. Methods followed by local Asha workers (health workers) to track the health and vaccinations of pregnant and lactating mothers and babies were studied to identify lacunae and a system was proposed to reduce lapses and improve self-tracking.

Besides these project ideas, tools like seasonal calendars and daily schedules contributed to ascertaining patterns in agriculture and related activities. Student researchers were able to utilize tools of community-based participatory research not only for quickly building rapport with the villagers, but they also gathered more data, opinions, and facts and information than they could have via faceless survey questionnaires or formal interviews. Ice-breaking exercises with school children led to an understanding of the mindset of the youth who see migration as an inevitability (Figure 8). Due to the relaxed nature of questioning and discussion, the villagers were more willing and comfortable in discussing their lives and conditions.

Conclusion

This paper presents our findings from an exploratory field study in six remote villages in Uttarakhand, India, integrating Community Based Participatory Research and Design Thinking approaches. The main aim was to develop an empathetic framework of research that eases both the student researchers and people of the community into easy dialogue.

Probing into overt and conspicuous findings along with voicing the ideas and concerns of the local populace was the primary benefit derived from the participatory exercises. Student researchers used these tools to find and prioritize problem areas that affected the local people the most. The selected problems needed to reflect the needs, aspirations, and requirements of the community and the village. Active participation from the villagers motivated all the stakeholders and propelled them into detailed conversations about the hardships faced living so remotely, obstacles in sustenance, and reasons for migration. It also functioned as a trust-building exercise between the student researchers and the village community.

The scope of this research is limited to the application of Community-Based Participatory Rural Research as a research method in social design. The study series is ongoing and has presented promising results which

may open many channels of improved and detailed research methodology and user interaction in settings that students may not have been exposed before. Community-based participatory research, with its intense emphasis in human beings and their power to create and recreate, holds distinct promise in being used as a design tool for social good. This paper presents the findings of our first exploratory stage in this direction. Future areas of research will involve further exploration into co-designing activities with more tangible and entrepreneurial outcomes.

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We thank Doon University for giving us the freedom to explore trans-disciplinary curricula within the higher education framework. We acknowledge the Design students of cohort 2015 as enthusiastic and creative participants in the research. This research would not have seen fruition without the willing and open-minded cooperation of the local authorities and residents of the villages of Jabukathal, Tana, Puna, Kalasila, Bajet, and Kaneda in Uttarakhand, India. We are also grateful to our colleagues whose guidance and inputs on rural development in Uttarakhand informed our research throughout.

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