A Review of the Participatory Rural Appraisal (PRA) Approach to Watershed Management in India

Abstract

Watershed management activities are carried out with an aim to keep natural resources from deteriorating that ultimately safeguard ecological balance as well as consistent economic growth. In this paper, some important peculiarities of Participatory Rural Appraisal (PRA) procedures for watershed management have been comprehensively summarized.. PRA's mission is to develop professionals, universities and state agency officials, and local communities to create context-appropriate programs. Several governments and non-governmental organizations (NGOs) have also been engaged in ongoing participatory watershed initiatives that have shown to be productive. PRA components include methodology, performance, and attitude, as well as exchanging ideas with other beneficiaries. PRA work was employed in semi-structured interviews and transect walks, timelines, wealth matrices, and other tools. Soil erosion, erosion management technologies, soil moisture conservation, groundwater recharge, soil fertility and performance, crop and cropping patterns, agricultural profitability, non-arable agricultural production, and community wellbeing were all investigated in the PRA. The lack of cooperation among donors, government entities, and non-governmental organization is the biggest hurdle to applying this strategy. Emerging technologies, such as the role of geographic information systems (GIS), are becoming much more common, with a significant impact on farmers' socioeconomic conditions.

Keywords: Watershed management, PRA approach, Transect walk, GIS.

Introduction

The concept of watershed management has changed more than its implementation during the last decade. The reversals from centralized uniformity to local variation and from the blueprint lo learning process are all examples of these transformations. Changes in learning styles have begun as a result of these developments. This trend is away from extractive survey questions, new techniques, methods for participatory assessment and analysis. Local people now carry out more activities traditionally realized by outsiders in rural and urban areas. Whether these

techniques and tactics can make participation more realistic and the rhetoric more genuine (Ramprasad, 2021).

This concept has evolved natural, social aspects and may be efficiently used; hence, water management, vegetation, livestock, and human resources are critical components of watershed development programs. Watershed development programs are being implemented by government agencies as well as certain NGOs working watershed management field. A watershed is any surface area where precipitation collects and drains into a shared exit. A drainage basin or catchment region can be defined as the same as a water basin. About 80% of the world's population faces some form of water insecurity (Vorosmarty et al., 2010), which often hinders the attainment of goals related to food, energy, and health security (Singh, 2017) besides affecting regional security (Pomeranz, 2013) and environmental sustainability (Bakker, 2012). Water security is governed by many factors from hydrology (water availability) to socio-economic conditions (water infrastructure, economy, socio-politics, and culture) and by future changes (climate change and measures to adapt to that change) (Grey and Sadoff, 2007; Bakker and Morinville, 2013) and by complex interactions between these factors. A drainage basin may comprise several cities, regions, or even nations (Li et al., 2005). A waterfront's size is not fixed since it can range from a few hectares to a few thousand hectares (Adams and Godwin, 1998). Each water line pertain special blend of intrinsic properties, maintenance, application etc. It also shows very irregular and fancy response to flow and quality of water. Watershed strategy focuses on water usage to increase agricultural productivity while also protecting irrigation for rural regions' socioeconomic progress (Joshi et al., 2005). As natural units, management teams use the resources to measure how their decisions influence the operational environment in watersheds. A watershed is made up of several smaller portions that make up one complete (Adams and Godwin, 1998). Soil conservation and rainwater collection were first organized in watershed management programs with the primary goal of improving productivity (Konduru et al., 2008). In the beginning of watershed management programs, contracts were handled in a top-down, compartmentalized manner. As a result, there was less openness and unfair benefits for members of the community. The people with much better financial conditions who can afford to invest in a bore well have taken advantage of enhanced water supply. Small and destitute landowners, who account for 85 to 90 % of the population, may not benefit properly from conservation efforts (Konduru et al., 2008).

As a result, the project's job prospects were reviewed, and people' engagement was inadequate. In the 1970s, India began investigating watershed development projects to improve land management, soil productivity and fertility (Yoganand and Gebremedhin, 2006). Despite the tremendous improvement in the latter half of the 1980s, things have become worse again since 1990. Beginning with water and soil conservation, watershed projects firstly focused on the areas of those two elements. It was only decades later that it was realized that just working on the technical and physical measures to meet the aim of watershed development could not succeed. Rural development has to take into consideration social, economic, and institutional issues as well.

To execute watershed initiatives, the Ministry of Rural Development (MoRD) released a series of recommendations in 1994, which called for utilizing available watershed assets to the greatest extent possible (Yoganand and Gebremedhin, 2006). This promotes excellent non-governmental organizations (NGO) and policy practice, including helping to raise awareness, being responsible for developing from the ground up, and working with NGOs. The main goal of this progressive program was to help the commoner. A watershed management strategy incorporates environmentally appropriate technologies and practices within the natural boundaries of the land, water, animals, and humans, to create optimal development while minimizing damage to the natural environment: conservation, regeneration, and wise use of all resources, especially land and water (Li et al., 2005).

The inevitable outcome is that India will have to constantly invest in water-management technologies to meet the severe drought and flood emergencies that follow from its residents' insatiable needs for water. Water use surpasses water availability, and tensions over water use rise (Dutta, 2007). One of the drought-prone areas' development initiatives launched by the Indian government in 1972-73 is the Drought Prone Area Programme (DPAP).

To deal with soil and water conservation issues of arable as well as non-arable areas, to develop and test technologies of water conservation, to enhance capacity through training, the Central Soil and Water Conservation Research and Training Institute (CSWCRTI) was established in April 1974 (Konduru et. al., 2008). The watershed dryland agricultural development project was begun in 1983. In this project, 47 watersheds in cooperation with the federal government were developed to conserve soil and water resources, better management of crops and implement land-use schemes. Amid the Eighth Five-Year plan of 1990-91 in concerned to the dreadful drought of 1987, the Government of India introduced the National Watershed Project for Rainfed Areas (NWDPRA). The Drought Prone Area Development Programme (DPAP), the Desert Development Programme (DDP), the River Valley Project (RVP), the National Watershed Development Programme for Rain fed Areas (NWDPRA), and the integrated wasteland development plan are among the programs and initiatives designed to implement watershed-development ideas (IWDP) (IWDP). They primarily relied on engineering to build percolation tanks, contour bunds, gully management systems, contour trenches, and other water-collecting projects (Konduru et al., 2008).

The creation of watershed models is being done so that stakeholders, such as the community, have the right road to empowerment, making programs that rely on supply be demand-based instead. Previous waterfront projects have demonstrated that using a one-size-fits-all method would not deliver the intended outcomes, and it is thus essential to apply community-driven approaches while including individual ones. Comprised of multi-disciplinary teams with complete technical knowledge, community problem-solving initiatives are prevalent-people in the community and women both gain from being granted equal opportunities.Watershed management is often based upon research conducted at smaller scales, despite limited evidence to indicate scalability to the watershed. Although there are examples of improving water quality due to sewage management (Boesch, 2019; Walve et al., 2021; Fisher et al., 2021), there are few examples of successful recovery resulting from agricultural management (Greening et al., 2011; Melland et al., 2018; Boesch, 2019).

Limitations of traditional Watershed management approaches

In the past, reliance on natural resources in rural regions was widespread. Before the biophysical water basin occupation, watershed management had been under development and utilized a top-down method (Rhoades and Elliot, 2000). Top-down techniques in the traditional system failed to accomplish project goals because local people were not regularly consulted. When users embrace the role of custodian of watershed resources, the effect of watershed programs and activities become more influential and sustainable (Johnson et al., 2001). A wide range of products on watershed management and study is possible for an engaged user base. The prior methodology provided limited opportunity for learning, and top-down design reinforced the natural biological processes to provide the right of way to watersheds. More often than not, traditional planning is focused on the amount of land a city has, rather than the needs and skills of the people who live there (Rhoades and Elliot, 2000). As a result, local stakeholders and project managers and outside watershed stakeholders (e.g., academics, planners, and politicians) were divided on this issue.

The assumption of technology transfers rather than technology development on people's land and surroundings was a fundamental obstacle in the conventional watershed management method. Another significant shortcoming was in training and research, with agricultural research organizations and agricultural universities bearing the majority of the duty for training. They are strong in watershed technical features but lacking in social science parts of the institutional structure and establishing relationships with nonfarm sectors to develop value-added goods from watersheds (SRISTI, 2005). A critical shortcoming overlooked the unique soil characteristics and circumstances in the local environment while devising and executing projects. For watershed programs designed and implemented jointly by the users, scientists, and other stakeholders, it is better to implement on-farm research trails. Farmer involvement in agricultural research enables scientists and farmers to determine trial procedures and implement emerging technologies together, essential for effective technology adoption. The majority of community members involved in the conventional model focus on project execution, with just a brief consideration of institutional development to be done for the long-term sustainability of the community resource (Joy et al., 2004).

Transformed perspective

Historically, federal and state governments have supported supply-driven watershed development. These top-down tactics prevented stakeholders from getting their input into program design. The expectations of stakeholders significantly differed from the efforts needed to accomplish watershed development. Watershed efforts that lack public involvement often fail to achieve their aims. Participatory watershed management has grown into a new watershed development paradigm in India. The hope was that a change in paradigms would bring about more decentralization of governance and empower the participation of local communities to improve their capabilities to address new challenges.

Participatory rural assessment methodology in watershed management

An in-depth participatory rural assessment technique with a watershed management focus to help community members learn and take action.The methods of PRA and PLA (Participatory Learning and Action) are also used by field workers. Since the inception of the new paradigm of watershed management, an entirely new approach to sustainable rural living has emerged. It has asserted a central role in rural development in fragile and semi-arid regions of the developing world. Watershed management concept multi-sectoral, cross-sectoral, and multidisciplinary (Rhoades and Elliot, 2000).

By definition, this kind of watershed management is "focused on building a self-sustaining system towards sustainability" (Wani et al., 2005). When watershed stakeholders work together to coordinate their goals, priorities, evaluate possibilities, and execute and monitor the results, it is known as participatory watershed management. This method was in widespread usage by the end of the 1980s. The system began to incorporate self-help organizations, watershed implementation committees, and Zila Parishad administrative divisions more thoroughly.

With increased financing for watershed development, many non-governmental organizations (NGOs) became more involved in carrying out watershed activities, a hitherto untapped resource. Since the PRA is constantly changing, no fixed definitions can be used and must be changed regularly. The many ways that researchers have defined and amended PRA are listed below: A expanding family of techniques and processes are known as a participatory rural appraisal (PRA) (Mascarenhas et al., 1991). The PRA is built on the successes of the many communities around the country that manage their resources sustainably (Cavestro, 2003).

The practice of knowing people, their assets, and their socioeconomic conditions while also examining their aspirations and potentials in partnership with them is known as a participatory rural appraisal (PRA). For effective watershed management, you absolutely must have PRA (Partnerships for the Recovery of Arid Lands) (Winnegge, 2005). It is a study where an integrated group of learners work together to learn something outside of the classroom while being supported by and getting help from community members (Theis and Grady, 1991). For instance, to help communities stay aware of the various changes happening around them, a rising family method has been referred to as an increasing home approach for enabling people to share, express, and assess their knowledge about life and situations so that they may strategies and act (Chambers, 1994). Participatory Techniques and Methods (PRA) is a family of practices that emphasizes local know-how and enable locals to formulate evaluations, analyses, and strategies (World Bank, 2009).

The participatory rural assessment methodology in watershed management

A step in the making of the 1980s is the decade during which many quick rural evaluations took place in rural development (RRA). According to this definition, an RRA is defined as an assessment conducted by a multidisciplinary team that has lasted at least four days but not more than three weeks; the evaluation is based on preliminary information, and a shift from an RRA to a participatory rural appraisal has occurred (Theis and Grady, 1991).

The move to employ rapid rural assessments (RRA) instead of conventional surveys was based on the belief that RRAs were not very participatory. The information contained in the surveys

was incorrect. Concurrently, a push to extend the participants' involvement in participatory rural assessments (PRA) took place. Placing emphasis on "passing the stick" (when participants drew map or transect) was a direct outcome of the focus on process control that PRA put (Chambers, 1994).

Rapid Rural Accounting was established in the 1970s and 1980s in response to problems outsiders had in getting a grip on or comprehending local people during development projects, as Li et al. (2005) described. PRA is a group that attempts to bring together government officials, development practitioners, and local citizens to devise locally relevant projects. Table 1 shows evolution of Soil and Water Conservation/Watershed Development Programmes in India

Table 1: Progress of Soil and Water Conservation/Watershed Development Programmes in India

Pre- Independence Period	
1928	Royal Commission of Agriculture was established on July 24 Soil erosion problem recognized in ravine area.
1939	Dry farming development scheme introduced with contour bunding as an integral part
1945	Famine Commission was appointed Soil and water conservation (SWC) recognized as an important relief measure
Till 1948	Except Bombay presidency, SWC work was undertaken only on distributed basis. This continued even in the post independence period
Post-Independence Period	
1950-60	Land development act enacted by different state legislatures, land development banks were made in a few states
1960-70	As a relief programme, SWC practices were initiated under special schemes for drought/desert prone areas
1967	National Scheme for Ravinous Watersheds made known
1974	Soil conservation in the river valley projects Scheme introduced
1982	To develop dry land agriculture, total 46 model watershed development projects were launched
1984	Watershed development projects in four states initiated by World Bank
1986	Ministry of Agriculture brought National Watershed Development Programme for Rainfed Areas (NWDPRA) in 16 states
1989	Integrated Watershed Development Project(IWDP) implemented by Department of Land Resources under Ministry of Rural Development/National Wasteland Development Board (NWDB) arranged
1991	World Bank started IWDP for plains in three states
1994	WSD by merging of various programmes under Drought Prone Area Programme, Desert Development Programme, Integrated Wasteland Development Programme, Jawahar Rojgar Yojana and Employment Assurance Scheme (Ministry of Rural Development)
2001	Panchayat Raj Institutions empowered by Hariyali Project in implementation of Watershed Development Programmes
2006	for setting up a National Authority for Sustainable Development of Rainfed Areas(NASDORA), Neeranchal Project was organized

India has a long history of non-governmental participatory watershed management and according to tradition, it was a small village in India's Maharashtra state titled Ralegan siddhi where the seeds of participatory watershed management were first sown. Several significant social changes took place in the village due to the efforts of village leader Anna Hazare, including soil and water conservation measures as along with other issues such as liquor prohibition, family planning, conservation of non-arable areas and volunteer labour for community welfare (Kerr et al., 2002). This brought about mass participation in watershed management, which resulted in a switch from a bottom-up approach that concentrated on social and institutional factors and biophysical attributes to a strategy that incorporated both social and environmental considerations. For many, understanding has now been reached that communities have a significant role in sustaining the production of natural resources in a sustainable way (Turton et al., 2009).

India's political and other institutional structure

India has a population of about 1.38 billion people, it ranks second in the globe (US census bureau, 2021). There are 29 states and nine union territories in India that are managed by federal government. Registration is done at each state's own registration assembly. The states have total authority over the natural resources in their own ranges. Founded on common sense, the water law in India is based on the belief that landowner rights are equal to those of other riparian owners and that water should be received by them without diminishing the flow, volume and quality (International Environmental Law Research Centre, 2007).

In addition to their main role, the federal government was in control of national legislation and had taken on the task of correcting water resource imbalance in one state, such transferring water from one river basin to another. In sectors like as water system, irrigation, canals, draining, and embankments, water storage, hydroelectric, and fisheries, groundwater is regulated and managed by the state. The state government determines how groundwater is allocated throughout the state. The new water management strategy now encourages community members to take part in it (International Environmental Law Research Centre, 2007).

According to MoRD guidelnes of 1995, a watershed development advisory committee is entrusted with managing the initiative at the district level even by district rural development agency (DRDA). Project Implementing Agencies (PIAs) would've been chosen from among the departments, NGOs, and companies interested in carrying out the initiatives by this committee. Each PIA is responsible for 10 to 12 watersheds, and an interdisciplinary watershed development team (WDT) is required to be established (Konduru et al., 2008).

Each watershed implementation is performed by the Watershed Executive Committee (WEC). Watershed development association (WDA) chosen a committee which contain representative members of user groups (UGs), self-help groups (SHGs), and panchayats. All persons whose livelihoods are linked to the watershed region and WEC members who advocate for the interests of these people are all members of the WDA. Once the Village Implementing Organization

(VIO) receives the fund, it gets linked to Village Watershed Association (VWA) through an organizational structure.

The VWA is made up of local SHGs and other community groups. WDA committee helps DRDA make decisions on where to set up new villages, provides training to those who are setting up new villages, and is responsible for monitoring. At the implementation level , the WDA undertakes watershed projects with the WDT consisting of PIAs. TheVWA and WEC take over the administration and maintenance of the assets when the watershed project is finished through a Watershed Development Fund (WDF) created with contributions from UGs and SHGs, (Konduru et al., 2008).

PRA's principles and components

PRA Fundamentals

According to Cavestro (2003), regardless of the objective or situation, the five building blocks of each PRA strategy may be defined as follows: As a means of allowing locals to participate in data collection and assessment, PRA is highly reliant on community participation.

Flexibility – Every development situation will include fe variables viz. size of the PRA team and also its skill mix, available time and resources, subject and area of the work etc. that impact the overall strategy to the development.

Teamwork - In general, a PRA should be implemented by a team made up of several people who know the local language, including women and representatives from many sectors and social scientists. PRA work is all about collecting only enough information to provide practical recommendations while also helping to save time and money. Due to the more qualitative nature of PRA-generated data, new approaches for confirming the validity and reliability of the conclusions have been created. This encompasses sampling and cross-checking, both of which employ diverse techniques to investigate several points of view on some subject.

Constituents of PRA

Constituents of PRAare mainly composed bymechanism, action and attitudes, and sharing (Mascarenhas, 1991). First of all, it is necessary to recognize that people in rural areas needed participatory ways to foster their analysis. Methods have given a professionally approved entrance point for distributing PRA (Chambers 1994). Community-level solutions currently include several different techniques for watershed management. This list includes approaches such as:

- **Interviewing in a semi-structured manner**

A semi-structural interview utilizes open-ended questions to facilitate conversation between the people. You may learn a lot by talking to locals about subjects that interest them. Some tiny groups of villagers-key informants, interest groups, and so on-will all profit from SSI (Cavestro,

2003). The interviewer communicates reveals background of the study and policies of interview group thoughout the method of semi-structural interview.

The respondents are offered a predetermined but open-ended series of questions, allowing them to discuss and express their ideas and opinions. While the questions are often basic, they can sometimes be difficult for the other person to answer with a precise sequence to assist the conversation. Be sure to test the interview questions before conducting interviews. The key to teaching interviewers how to conduct semi-structural interviews is training, and it is necessary to hone interviewing skills to be an effective interviewer. During training, teamwork preparation, interview setting, sensitive listening, sensitive questioning, and evaluating answers should all be done.

- **The use of social mapping**

Social mapping is a form of sketching or drawing of communal homes, including temple complexes, supermarkets, rice mills, schools, pharmacies, paths, highways, water pumps, irrigation, and recreational facilities. As most of these qualities are not clearly addressed in the community vision setting or village land use maps, these features are often overlooked. It serves to assist in the visualization and distribution of housing and other community amenities and infrastructure. It may be used to establish a plan for village development, assist in its execution, monitor, and judge its success (including the selection of village organizing strategy).

- **Transect walks**

The primary reason for transect walks was to provide information to area employees on the features of their neighborhoods. Transect walks are used to collect more information on a village's natural resources, such as their diversity and the problems they provide and develop a greater knowledge of the place. Various additional aspects, including topography, land usage, property ownership, soil characteristics, vegetation, crops, and other elements, are commonly considered. When it comes to planning land development initiatives, they are excellent at making sub-zones their focus. Changes can be monitored and assessed over the transect if it is implemented at the beginning, in the middle, and after the research period (within the same season).

The use of a transect walk can determine how the various players, such as local government officials, NGO team members, and citizens, are reacting to a particular situation. The results presented may prove to be quite valuable for verification and assessment purposes. Firstly, people travel on a route mapped out by key informants group from local community and understands the geography of area along the way. To ensure the walk includes all of the agro-ecological zones, the whole intervention region should be covered. It could also go from ridge to valley or straight over the hill, if interventions are at the same height. To raise awareness about the impacts of climate change on India's tribal people, a transect walk was undertaken throughout 14 tribal communities in the Nilgiri Highlands, a region located in Tamil Nadu (NGO Programme, 2005).

- **Spider web diagram**

It is an excellent method to view all of the steps involved in an intervention to see where progress has been made. Features are organized within the web frame to correlate to their importance, with values ranging from 1 to 10. Spider web diagram is also recognized as cobweb diagram, participation or evaluation wheel. It is a very visible method for determining how a project is progressing. This activity may help plan and assess future projects, but it is also excellent for measuring and evaluating such initiatives (NGO Programme, 2005). Each aspect is given a numerical score ranging from 1 to 10 and is represented by one arm of the web frame to receive a final grade. Individual rankings are also feasible for an organization's, community's, group's, or performer's while (measuring) or after the project has concluded (assessment). Using the spider web diagram, it is possible to produce an immediate sense of the comparison effect, and participants easily comprehend the result. Appraising quantitative estimates was a challenge, to begin with, and was made much more difficult by quantitative estimations.

- **Participatory resource mapping**

In participatory resource mapping, map of the town is prepared by a group of volunteers. The way in which area is displayed is notable. Normally, locations that are very important depicted more distinctly. A resource map is a tool that is useful for finding the resources available in a community. Relevance is the key to creating a local resource view, but not when creating an accurate map. Everyone should contribute to the map's material depending on their interests. A resource map has been created to collect information on villagers' impressions of the community's natural resources and how they are utilized (Cavestro, 2003).

- **Method of photographic comparison**

It is a simple method to provoke people to reflect on how different things have become in a particular area through time. Land-use and land-cover changes, land-molecule changes, and aquatic body alterations may all be discussed in the comparison. Due to their physical limitations, photographs are more helpful in documenting significant changes in nature, but are less helpful in recording changes in people and institutions, especially concerning attitudes and methodologies. To properly represent social change, complementary data such as group discussions is necessary (NGO, 2005).

- **Ranking of the matrix**

Matrix grading for crop kinds provides engaging, relevant knowledge and feedback supported by beautiful tables and figures. As demonstrated in matrix scoring, scientists and others who become more participatory in their approach could become more impressed by farmers' criteria, assessments, and skills. In matrices, row criteria are used for the rows, whereas columns use humans to fill in the boxes. Participants are provided with seeds to indicate the relative values of each item. Placement activities are helpful to both villagers as participants and development practitioners. For illiterate farmers, problems must be shown by pictures or tangible things. Agricultural issues were ranked, and their significance was established. During the workshop's preparation phase, the subjects were found through informal interviews (Cavestro, 2003).

- **Time line (historical mapping)**

A creative way to better understand how changes occur over time and across cultures, using numerous documented details; community facilitators hold small-group discussions with villagers, explaining the most critical events in the community's past and helping build a historical timeline based on the information. To fully represent all facets of the community, it is necessary to seek out the differing viewpoints of different community organizations. The entire event's timeline can be used to schedule talks dedicated to helping organizers, participants, and attendees face particular challenges, such as technological and social advancements or activities in a community's history that have aided its members in overcoming difficult situations in the past.

- **H Form**

This rating system is utilized to assess and identify both the positive and negative components of a given situation. A neutral presentation of both viewpoints aids folks in concluding. This is a dedicated approach for program review and monitoring. It was developed in Somalia as a means of helping local communities to better monitor and evaluate environmental management in their locality. Using this technique may provide information to build indicators, carry out activities, conduct interviews and conversations for individuals or groups. This method should be used in conjunction with literate participants, as described below, but it can also be used when not literate people are involved.

- **Ranking of wealth**

For identifying the economic features of the village's households, wealth ranking is a PRA technique. It shows the monetary situation and quality of life of a town's households. The methodology can help evaluate the socioeconomic and social status of the residents of a city. As a result of this survey, the village can identify the households in the area who are most in need. It offers a foundation and allows designing a village development plan, put it into practice, monitor its effectiveness, and evaluate its results (Cavestro, 2003). the concept of ranking well-being is an extension of ranking wealth, which focuses on things like money, belongings and considers physical health, access to necessities, and indebtedness (Alur et al., 2005). In their article *"Measuring Socioeconomic Position in Mongolia: A Hidden Purpose?"* (1992), Mearns and the co-authors concluded that the wealth ranking of the population was serving a hidden goal by appearing to be a "hard statistical procedure" that academics and bureaucrats from around the world like their colleagues have been trained to use and are accustomed to. Five major approaches to innovation includes:

- misconduct predominant because it compels others to draw from it;
- involvement the best results;
- outsiders helping local individuals reach eight goals;
- updates on worthy findings;
- a project is always underway, diplomatic, and institutional.

- **Attitude and behaviour**

This PRA fundamental approaches how people in the outside world were behaving. Residents had to down from the pedestals, sit down, and hand over the stick, giving outsiders a seat to acquire and transmit information and analysis properly. It should be avoided because of how contrary this conduct is to formal professional training and self-esteem. Many people find it difficult to be quiet, abstain from interrupting, refrain from offering their opinions in the field, and avoid giving critiques. The discovery that change in how others act may be learned via field experience training prompted a shift in focus from classroom training to on-the-job training. *"Conduct and attitudes above all else"* is the phrase that Kumar, a senior trainer in the Indian government, stressed in his remarks. Kumar… found that international participants who had been presented with less knowledge about the methods had better facilitator results than those presented with more information. "Shoulder tapping" (Shah, 2001) was an innovative solution by Anil Shah, chief executive of the Aga Khan Rural Support Programme (India) to help improve field behavior. This is an agreement among community members to tap colleagues on the shoulder if they query, pose a leading question, or comment on the topic. Do-It-Youself (DIY) has sparked the most rapid and profound behavioral and attitudinal shifts , while outsiders are educated to perform different activities, likegrain winnowing, mud-a-walling, thatching, manure spreading, weeding, transplanting, washing clothing, cooking, or collecting wood or water, it is essential to hire locals to instruct to connect with the community. Outside individuals are captured on film, and then a replay is presented to both them and to other communities, as improved upon by Kamal Kar in India. For outsiders, who may or may not be native, this place will substantially affect individuals and establish rapport with natives.

- **Sharing**

Sharing was one of PRA's three fundamental principles and practices. A better approach and mechanism of dissemination for practitioners and trainees has been devised. It is two-dimensional: it deals with exchanging knowledge and having fun.
The three most common techniques to pass on information are: especially through group analysis and visual displays; locals will help each other out. It is important to mention that the expertise of locals benefits outsiders.

Those outsides from the community of practice are asked to refrain from bringing their ideas and ways of thinking or imposing their own reality as a requirement for supporting this process, at least initially. The outsiders talk to each other and the locals about what they have learnt. Our company's approach has been adopted and applied by many organizations, corporations, governments, and continents worldwide. This came from several Indian NGOs, including Action Aid, Aga Khan Rural Support Programme (AKRSP), Mysore Resettlement and Development Agency (MYRADA), OUTREACH, Seva Bharati, and SPEECH, which have provided a system of support for volunteerism and established, developed, and disseminated a culture of giving. Anyone who is interested is invited to come to the village camps.

Training camps organized by nonprofit organizations commonly involve participants from other nonprofits, the government, and other local groups and those who run the organization. The exchanging experience was a component of the camp's day-to-day activity. Beyond people providing information and sharing it and strangers, the objective was to actively engage in everyday activities such as sharing meals and celebrations. South-South collaboration has been

about the same. 11 South Asian nations attended the first worldwide PRA workshop, organized by three Indian NGOs - Action Aid, AKRSP, and MYRADA.

Organizations practicing PRA for watershed management in India

In India, several organizations employ participatory techniques when working in the watershed. These five NGOs in India operate the following water-related projects: The Aga Khan Rural Support Program (AKRSP), the Indo-German Watershed Development Program (IGWDP), a Watershed Support Services and Activities Network (WASSAN), the Water Organization Trust (WORT), and the International Crop Research Institution for the Semiarid Tropics (ICRASAT). While the Government of India typically sponsors and partners with NGOs such as World Wide Fund for Nature (WWF), Greenpeace, and Greenpeace India, UN institutions such as United Nations Development Programme (UNDP) and United Nations Development Programme (UNEP), and foreign governments such as United States Agency for International Development (USAID), Department for International Development (DfID) from the United Kingdom, German Agency for echnical Cooperation (GTZ) from Germany, and the bi-lateral Indo-Canada Environmental Facility, these NGOs are sponsored and partnered with the Ministry of Rural Development (MoRD) headquarters of the Indian government, UN organizations such as UNDP and UNEP, and foreign governments such as USAID, DfID from the United Kingdom, GTZ from Germany, and the bi-lateral Indo-Canada Environmental Facility.

The AKRSP is well-known for publicizing its work. When employing the AKRSP PRA approaches, planning teams need to identify a goal for the project, pick a methodology for getting the job done, tell the villagers about the plan, assemble a transect map, conduct transect walks, look into equity issues, hold village meetings, and write up management plans for submission to the government (PLA Notes, n.d.).

Impact of PRA on watershed management

Watershed development has emerged as a critical component of rural development strategies in many developing nations. For example, India is making a significant effort to resolve dry and semi-arid regions, such as soil erosion, water table, especially drought-related rural unemployment and poverty, by supporting large-scale watershed development efforts. Because watershed projects are likely to improve farm profitability, boost agricultural production, and safeguard soil and water resources, it is safe to say that watershed projects may all be thought of as watershed management projects. In India's several agricultural eco-regions, watershed projects have begun. Such programs are assisted by both national governments and international organizations, among others.

Many development organizations and international funders were attracted to funding participatory watershed programs after the Earth Summit because of their popularity, according to Rhoades and Elliot (2000). The watershed development paradigm shift aims to help rural people live more sustainably and improve rural poverty levels.

It was most commonly done because: increasing the profitability of agriculture increasing the production of agriculture; conservation with soil and water; putting people to work in remote locations in rain-fed regions to minimize the risk of crop failure due to drought.

Several studies conducted by Turton et al., Kerr et al., Wani et al., Joshi et al., and Reddy et al. (2006) aim to gather the information on the importance of participatory watershed initiatives, and this information is provided in this article. Farm output was found to benefit from participation in watershed efforts in numerous studies. Higher agricultural productivity was due to more irrigated land below the watershed region (Shah, 2001). Rain-fed crops had better production gains, particularly concerning yield.

Crop yields from rain-fed crops increased by as much as 280% (Renfro, 2007). This research indicates that people's involvement in watershed management has helped boost agricultural profits and improve the financial security of the needy.

The watershed operations have helped increase the moisture in the soil by increasing the moisture of soil. Number of farmers in the zone of watershed development zone recorded an increment in moisture of soil (Shah, 2001). Improved soil moisture will allow diversification of farming activities in rain-fed regions. This increased cropping intensity is predicted to range from 13 - 25 % (Renfro, 2007).

In land-use planning projects, the adoption of techniques to reduce runoff and promote groundwater recharge allowed for increased water storage capacity and better local drinking water (Butterworth et al., 2001). Rural dwellers have a greater chance of landing a job if watershed development measures are implemented. The enhanced availability of water and a more diversified cropping pattern,which included agriculture, all contributed to this improvement.

Current challenges to PRA

The Indian government spent about $175 million on watershed control initiatives in 2001/2002. On the other hand, collaboration is difficult to achieve because of the paucity of funding, governmental bodies, and non-governmental organizations (NGOs) (Sharma, 2003). The fact that there is no policy-level communication between the many ministries concerned with watershed management is also a barrier to effective policy-level communication across the different levels of government.

Many departments are involved in watershed management, with varying objectives of policy running them (Wilson et al., 2003). The public will also be affected because many of the initiatives are in the program-style, and everyone will have an opportunity to get involved. When disparities already exist, superficial involvement is just adding to the problem. The rules even contain estimates for how much a hectare will cost. A person's right to groundwater access is linked to their land ownership. No work has been done to help landless farmers deal with all of these issues. As a result, participants have no sense of ownership, and the project's long-term survival is at risk (Sharma, 2003).

An additional issue is a failure to give appropriate attention to environmental water limits, a lack of understanding of ecological sustainability, and adequate monitoring and assessment of the effects (Gosain and Calder, 2003). Additionally, because check dams (which may cost up to half of the whole cost and assist only 15% of the families they are intended for) are commonly used, attention to these expensive technologies may account for half of the total cost. Low-cost and effective local infrastructure is completely overlooked, while indigenous wisdom is ignored (Sharma, 2003).

Innovation

Innovative methods based on geographic information systems (GIS-based) watershed management is currently being used. It is employed in both the planning and measuring stages as well as the subsequent assessment. The tracking and prioritization of water and sediment flow in a watershed has been done with this. In addition, watershed management activities are tracked and assessed.

Community members carry out a participatory three-dimensional mapping effort to generate a three-dimensional map of the watershed. The technological transfer is better because of this, leading to more empowerment. This information may be used in a GIS or the other way around (Gosain and Calder, 2003).

Similarly, Mc Call and Minang (2005) studied community-based natural resource management in Cameroon, including participatory GIS (PGIS) and participatory mapping applications, as part of participatory spatial planning. For the last time, integration of watershed management with all of the active community involvement has a proven track record of resulting in healthy development and management outcomes.

Advantages of PRA watershed interventions included better farm income, more excellent agricultural production, improved soil and water conservation, the creation of rural jobs, and a reduction in risk in rain-fed areas. Nongovernmental organizations (NGOs) and self-help groups (SHGs) are key players, as they need lower investment and have shown positive effects on the socio-economic well-being of rural or local people. While stakeholder’s cooperation and local people's lack of interest are necessary factors to implement the PRA strategy in watershed management, it must be said that stakeholders' lack of cooperation and local people's lack of interest are roadblocks to implementing the PRA strategy in watershed management.

This previous discussion made it evident that a more thorough and better-supported empirical evaluation of PRA strategies employed in watershed development efforts is needed in India. A project of this sort has to have baseline data, impact data, and participatory monitoring techniques used in it. Additionally, recent studies have found that organizations and communities with vested interests in watershed development partners, including the government, non-profit organizations, and communities, require a long-term support network to maintain programs. In principle, the ability to relocate landless and resource-poor persons should be improved by all of these approaches.

Competing Interests Disclaimer:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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