

PARTICIPATORY PARADIGM OF WATERSHED DEVELOPMENT PROJECTS IN SEMI-ARID TROPICS OF ANDHRA PRADESH: AN ASSESSMENT

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ABSTRACT

Watershed is a geohydrological unit for land and water resources development in rural areas which mainly emphasized on technology aspects rather than management of processes or its' stakeholders. This paper presents the relative performance among the watersheds implemented by government organizations and non-government organizations (NGOs) through emphasizing people's involvement in different phases of implementation. The results indicated that the watershed development team which is responsible for technical precisions of structures are better organized in government organization, but stakeholder institutions were weak in contrast to the watershed project developed and managed by NGOs. Overall, the government organization and NGO managed watersheds were able to fulfill about 55% and 67% of the possible components of participatory paradigm that indicated the need of further refinement and inclusion of participatory aspects while implementing the watershed programmes for better acceptability and sustainability of the programmes.

INTRODUCTION

In India, watershed development projects are one of the massive and effective rural development programmes to conserve natural resources i.e. rainwater and top fertile soil and increase the productivity especially in rainfed areas on sustainable basis (Grewal *et al.*, 1995; Ratna Reddy, 2000, Ratna Reddy *et al.*, 2006 and Sudhishri and Kumar, 2011). Initially, the greater emphasis on the watershed management was concentrated on techno-economic aspects rather than its implementation process. The Watershed Development Guidelines of 1994 (MoRD, 1994) and the subsequent revised Guidelines of 2001 (MoRD, 2001) envisaged a high degree of participation and local autonomy in designing and implementation of watershed projects. The degree of people's participation in watershed programmes is a major determinant of their success or failure, and literature indicated that many projects around the world have not performed well because of poor community participation (Johnson *et al.*, 2001) and there is ample evidence that the success of an eco-development or watershed development plan depends upon the involvement of local community (Jhariya, 2012; Mondal *et al.*, 2013). However, in India, there is dearth of information about the intensity of people's involvement, various dimensions of people's participation and their interactions in implementing the projects. Further, the roles and responsibilities, management and withdrawal system, etc. by the implementers belong to different institutional arrangements

also varied. Keeping the above in view, this study concentrated on the evaluation of relative performance of watershed development projects under different institutional structures in Semi-Arid Tropics of India.

MATERIALS AND METHODS

Locale and respondent

The study was carried out in semi-arid tropical region of India and a multistage stratified random sampling was employed for selection of watersheds for the study. At the first stage, the Andhra Pradesh state was selected purposefully as major portion of this state comes under hot, semi-arid eco-region. As watershed programmes are carried out by both government organizations as well as non-government organizations (NGO) as project implementing agency following their respective guidelines, one watershed each namely Mangampalli, developed and managed by District Water Management Agency (DWMA) and Mallapuram, developed by Rural Development trust (RDT), an NGO were chosen for primary data collection at the second stage. Watersheds institution's executives namely Chairman of the Watershed Association/Committee, Watershed Secretary, members of the watershed development team (WDT), self-help groups (SHGs), User Groups (UGs) as well as randomly selected stakeholders, beneficiaries as well as non-beneficiaries of the projects, as representatives of the village communities inhabiting in the

selected watersheds were chosen as respondents of the study.

Data and analytical tools

A list of 80 identified components covering nearly every aspect of participatory watershed development as developed by Dogra *et al.*, (2005) was used for preparation of questionnaire. Personal interviews were conducted for collection of primary data. The responses to the questions were valued with a 3-point scale. Physical verification of the documents (action plans, by-laws, proceedings register, bank pass books etc.) and field verification of executed works was also carried out for checking the authenticity of their responses.

A team of about 15 experts involved in implementing watershed activities in India from ICAR Institutes, SAUs, NGOs, State Departments and Funding Agencies including NABARD officials were asked to assign weights for all the 80 components used to measure various participatory aspects of watershed implementation. The 80 components were further consolidated into 10 groups of components for assessing the performance of a watershed development projects. The average weights (assigned by the experts) of these components grouped to form a major components and were summed up to estimate the weight of the particular major component in Mallapuram and Mangampalli watersheds (Tables 1 and 2). Based on their weights, these 10 components were ranked from I to X. The higher rank was assigned a weight of 10 and the lower rank was assigned a weight of 1 in a descending order.

Based on the response of the internal and external stakeholders of a particular watershed development project to the questionnaire, a score for each of the 10 major components was estimated by summing up the response values (2, 1 or 0) of the individual component which the major component constituted. The score was weighed by the weight assigned (1 to 10) to the particular major component. A maximum weighted score was also estimated for each of 10 major components by summing up of maximum possible score of each question multiplied by weight. The Participation Paradigm Index (PPDI) was estimated for each major component as (Dogra *et al.*, 2005):

$$\text{Participation paradigm index (PPDI)} = \frac{\text{Weighted score}}{\text{Maximum weighted score}} \times 100$$

For evaluation in terms of all the 10 major components, a Participatory Watershed Development Index (PWDI) was estimated as (Dogra *et al.*, 2005):

$$\text{Participatory watershed development index (PWDI)} = \frac{\sum_{i=1}^{10} \text{Weighted score}}{\sum_{i=1}^{10} \text{Maximum weighted score}} \times 100$$

where, $i = 1, 2, 3, \dots, 10^{\text{th}}$ major component

The Participatory Watershed Development Index (PWDI) was finally categorized into five major categories based on the PWDI value of a watershed namely "Excellent" (PWDI value: >90), "Very Good" (PWDI value: 80–90), "Good" (PWDI value: 50–80), "Fair" (PWDI value: 20–50), "Poor" (PWDI value: < 20) (Dogra *et al.*, 2005). If the PWDI for any watershed is greater than 90 then that watershed was perfectly

implemented with greater involvement of the beneficiaries with well-trained PIA's implementing in different subjects/aspects of the watershed and the success of such a watershed is excellent. If the PWDI for any watershed is less than 20 then that watershed was poorly implemented without much involvement of the beneficiaries with non-trained PIA's implementing in different subjects/aspects of the watershed and the success of such a watershed is poor.

RESULTS AND DISCUSSION

Analysis of the collected data indicated that the Participation Paradigm Index (PPDI) for watershed plan preparation was higher (75%) for Mallapuram watershed (Table 3). This clearly shows that the particular NGO (Rural Development Trust) concentrated very well on watershed plan preparation aiming it's' easiness during implementation phase which is essential for the success/sustainability of the project/watershed. The next higher values of PPDI in Mallapuram watershed were participation (73%) and transparency (72%). In earlier study by Dogra *et al.* (2005), it was observed that higher participation in Karot Nala watershed in Himachal Pradesh and with greater transparency in Aganpur-Bhagwasi watersheds in Punjab resulted better implementation. The higher level of participation by the beneficiaries in general led to greater success at Mallapuram as compared to Mangampalli watershed implemented by Andhra Pradesh State Agricultural Department. The Rural Development Trust (RDT) being a good NGO in the region, gave greater importance to the transparency for better success of the watershed project as compared to the other watershed projects implemented in the vicinity by other NGO's and Government organizations. Hence, RDT with higher participation and greater transparency in the implementation of the watershed has really lead to the successful implementation of the Mallapuram watershed. The common property resources (CPR) management for Mallapuram watershed was slightly higher (44%) as compared to the Mangampalli watershed (39%), however, in both the watersheds, these can be categorized as 'fair', i.e. below 'good' (Mondal *et al.*, 2015a). In Mangampalli watershed, the watershed development team was better and consisted of skilled subject matter specialists and the PPDI value for PIA's was higher (70%). The transparency of the watershed activities and accounts to the beneficiaries was also good (65%) in Mangampalli watershed. However, the Watershed Stakeholder Institutions were weak in Mangampalli Watershed (31%), developed by government department which is a concern from the sustainability point of view (Rao *et al.*, 2004 and Mondal *et al.*, 2015b). The participation, watershed meetings and accounts and records, WDT and equity were normal and the PPDI values for these components ranged from 50% to 60%. The Participatory Watershed Development Index (PWDI) for Mallapuram and Mangampalli watersheds were able to perform/fulfil 67% and 55% in the region which indicates that there were scopes to include many other aspects of participatory processes during development of watersheds starting from plan preparation to evaluation. Also a concerted and holistic approach to integrate all the stakeholder groups during various stages of the programmes from programme planning to post-withdrawal stages is required to enhance participation of people

Table 1: Grouping of individual components into 10 major components with their weights in Mallapuram watershed

Major Component	Number of component	Summed average weight*	Rank	New weight
Participation	15.0	70.8	I	10
Watershed plan preparation	7.0	70.1	II	9
Transparency	15.0	67.3	III	8
Watershed meetings & accounts records	10.0	66.4	IV	7
Watershed development team	3.0	54.2	V	6
Project implementing agency	2.0	53.8	VI	5
Equity	4.0	52.8	VII	4
Watershed stakeholders institutions	9.0	51.4	VIII	3
Common property resource management	9.0	48.9	IX	2
Monitoring and withdrawal strategy	6.0	47.8	X	1

Table 2: Grouping of individual components into 10 major components with their weights in Mangampalli watershed

Major Component	Number of component	Summed average weight*	Rank	New weight
Watershed development team	3.0	83.3	I	10
Project implementing agency	2.0	76.9	II	9
Watershed plan preparation	7.0	61.0	III	8
Transparency	15.0	59.7	IV	7
Participation	15.0	59.1	V	6
Watershed meetings & accounts records	10.0	56.0	VI	5
Equity	4.0	55.4	VII	4
Monitoring and withdrawal strategy	6.0	55.4	VIII	3
Common property resource management	9.0	42.0	IX	2
Watershed stakeholders institutions	9.0	34.0	X	1

Table 3: Participation and other paradigms in watershed programme in Andhra Pradesh

Particulars	Andhra Pradesh Watersheds	
	Mallapuram	Mangampalli
Participation paradigm index (PPDI)		
Participation	73.3	58.3
Transparency	71.7	65.0
Watershed plan preparation	75.4	60.7
Watershed stakeholders institutions	61.1	30.6
Watershed meetings & accounts records	67.5	56.3
Monitoring and withdrawal strategy	50.0	50.0
Common property resource management	44.4	38.9
Project implementing agency	50.0	70.0
Watershed development team	58.3	58.3
Equity	50.0	54.2
Participatory watershed development index (PWDI)	67.3	55.2

which will ensure the success and sustainability of watershed programmes.

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