

# COMMUNITY PARTICIPATION IN WATERSHED MANAGEMENT PROGRAMME

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## **Abstract**

Rural development is a way of improving the quality of life and economic well-being of people living in rural area. In rural areas, livelihood and natural resources such as land, water vegetation and livestock are inter-linked. In India, about 65 per cent of total net sown area comes under rain fed lands. In rain fed regions, crop production exclusively relies on rainfall for water. Hence, watershed development and management programme are more relevant, particularly in rain fed regions of the country. In India, Drought Prone Areas Programme (DPAP), Desert Development Programme (DDP), and Integrated Wastelands Development Programme (IWDP) of the Department of Land Resources were integrated and modified to a single adaptive comprehensive programme known as Integrated Watershed Management Programme (IWMP) with effect from 26-2-2009. The basic objective of the programme is sustainable socio-economic development of rural economy. Community participation is the corner stone of IWMP. The success of programme mainly depends on extend of community participation in the programme. This paper evaluates extend of community participation in various phase of the programme, and whether any difference in participation in the programme with respect to age and occupation of beneficiaries.

## **Key Words**

Biota, Biomass, Watershed, Watershed management, Integrated Watershed management, Community participation, Participatory rural appraisal, Sustainable Development

## Introduction

Watershed is a drainage area with well-defined natural boundaries. It is a geo hydrological unit draining at a common point by a system of streams. All land everywhere is part of some watershed. It is a topographical delineated area draining into a single channel. No two watersheds are exactly same. A small watershed of a hectares draining into a small stream may form part of larger watershed, which in turn may form part of a still larger watershed. All the combined watersheds may become a major river basin draining millions of square kilometre. Each and every water and land area is a part of one watershed or other. The people and animals are part of the watershed community (Maitra, 1995).

Watershed development is basically perceived as a strategy for enhancing livelihoods of the community inhabiting the fragile eco systems experiencing soil erosion and moisture stress (Rao, 2000). Watershed development programme are required to focus on generating full employment and livelihood to the rural people otherwise they did not give much attention to conservation measures and strategies (Sonowal& Satapathy, 2013). Watershed development programmes have been conceived as a strategy for protecting the livelihood of people inhabiting in the fragile ecosystem experiencing soil erosion, water scarcity, and forest degradation. It is seen as a panacea for overall economic development and improvement of socio-economic conditions of the resource poor sections of people inhabiting the programme areas through natural resource enhancement (GoI-2001).

Watershed management is an ever-evolving practice involving the management of land, water, biota, and other resources in a defined area for ecological, social and economic purposes. Watershed management brings the best possible balance between ecosystem and human system. The aim of watershed management is to ensure the availability of drinking water, fuel, wood, fodder, and raise income and employment opportunities of farmers and landless labourers through improvement in agricultural production and productivity (Rao, 2000). Scientific watershed management approach is a panacea for watershed issues and it is the only way to develop watershed(Lakshmikanthamma, 1997).

In India, Integrated Watershed Management Programme was launched in 2008. The programme is implemented under the Common Guidelines of Watershed Development, 2008. The IWMP is under the Ministry of Land Resources, Department of Rural Development, and Government of India. The Programme consists of three stages such as preparatory phase, watershed Works Phase, and Consolidation and Withdrawal Phase. In all the three phases,

community participation is assured in various means. In an integrated management perspective, the programme addresses various issues of the community such as food, soil erosion, droughts, low water quality, poor agricultural production, unemployment, migration of labour, poor livestock production and so on. IWMP not only helps in land, water, and biomass management for degraded areas but also conserve the biodiversity and genetic resources for future generations (Raghu, 2018). The projects under IWMP undertake a cluster of micro-watersheds of area about 5000 ha in rain fed/ degraded areas having no assured irrigation. The project cost is shared between centre and state in the ratio of 60:40.

### **Major Components of Integrated watershed Management Programme**

The programme primarily consists of three components such as: Natural Resource Management works (NRM works), Livelihood Assistance to Landless/Asset less Poor, and Production System and Micro Enterprise.

#### **I Natural Resource Management (NRM)**

In Watershed development works, various activities for Natural Resource Management (NRM) works are planned and executed. Natural resources are used by all living organisms for their survival. Natural resource base include soil, air, water, sun light, bio mass and so on. The major activities proposed under NRM works include construction and maintenance of contour bunds, staggered trenching, bench terracing, farm ponds, loose boulder check dams, water harvesting structures, planting of horticulture seedlings, live fencing, etc. Fifty six per cent of project fund is exclusively set apart for NRM works.

#### **II. Livelihood Assistance to Landless/Asset less Poor**

The IWMP project assisted in such a way that marginal and oppressed section of the village community like landless, small and marginal farmers, and women to gain maximum benefit from the project. The project offers opportunities for income generation by providing more employment opportunities to the watershed community. The programme aims at empowerment of women and offering them access to resources and decision-making forums. The implementation of non-land based livelihood support activities will be implemented through SHGs and User Groups (UGs) representing the marginalized sections of the community and women. Under the programme, seed money assistance is given to SHGs by reconstituting them as Joint Liability Groups (JLGs) for invest their money for earning

livelihood. Nine per cent of the budget component of the project set apart for livelihood assistance under the programme.

### **III. Production System and Micro Enterprise**

Individual financial assistance is given to farmers for enhancing production. In plain area Rs.24000 and in hilly area Rs.30000 is provided to individual farmers for enhancing production. Major activities proposed under PSM&ME are vegetable cultivation, banana cultivation, fodder grass cultivation, paddy cultivation, and pineapple cultivation. Ten per cent of fund of IWMP is set apart exclusively for PSM&ME.

### **General Features of Ranni IWMP Project Area**

In Kerala, the programme has launched in all the 14 districts. In Pathanamthitta district, four projects were implemented under IWMP viz, Ranni, Pulikeezhu, Mallappally and Koippuram. Among four projects, Ranni was selected for the present study as the project has highest fund allocation and utilisation in the southern region of the state. In Ranni, the Programme Implementing Agency (PIA) of the project was Ranni Block Panchayat. The project area for Ranni Block Panchayat consists of five micro watersheds viz, Seethathodu, Mamoodu, KavummoolaThodu, and Madathumoozhi, and Mulamkunnilpadi. Project has a total area of 6784 Ha which is considered as land under agricultural use. The present study evaluates extent of community participation in IWMP implemented by the Ranni Block Panchayat.

### **Problems Identified in the Watershed Region**

Problems identified in the watershed area can be classified as soil related issues, water related issues, agricultural related issues and animal husbandry related issues. They are briefly explained below.

#### **(a) Soil related Issues**

Soil erosion and soil moisture stress, lack of protection to streams and ponds, poor water storage capacity of the soil and heavy runoff, lack of soil conservation measures, increasing plastic waste disposal in the soil, decreasing fertility of the soil, levelling of hill and hillocks, and uncontrolled mining were the main soil related issues identified in the project area.

**(b) Water related Issues**

Water scarcity especially in upper reaches of the watershed, stream pollution due to waste disposal, lack of proper conservation measures, poor protection of natural water bodies and decreasing water table are the major water related issues recognised in the project area.

**(c) Agricultural related Issues**

Agriculture related major problems were diminishing agricultural production, Spreading of Rubber plantations, water scarcity, lack of marketing facilities, instability in prices of agriculture produces, lack of processing and product diversification, shortage farm labour, high incidences of pest and diseases, crop damage by wild animals, and fragmentation of land.

**(d) Animal Husbandry related Issues**

Elimination of local breeds of cattle, increase in cost of management, lack of convenient credit facilities, poor animal husbandry practices among the farmers, non-availability of dry and green fodder, and unavailability of good variety of animals at affordable prices are major issues related to animal husbandry.

**Participatory Rural Appraisal (PRA) of the Programme**

Community participation is ensured from the pre-project period to post project period of the programme. At the project level, various community organisations are motivated and developed in the form of watershed committee, User groups (UGs), Self Help Groups (SHGs), and Joint Liability Groups (JLGs). In the preparatory phase, the people participation is ensured in preparation of detailed plan about the project, selection of watershed for intervention, demarcation of boundaries etc.

In the watershed works phase, the important activities are Natural Resource Management Works, group financial assistance to Self Help Groups (SHGs) for finding out their livelihood activities, and individual assistance under production system and micro enterprises. The beneficiaries of each watershed interventions under NRM works are members of User groups. From UGs, a committee is constituted for implementing NRM works. Some others in the project region participated by contributing land, labour or animals for NRM works. The programme gives more attention to the participation of weaker sections

of the society such as landless/asset less people, poor peoples of SC/ST communities, people belonging to BPL categories especially women headed family etc. They were provided Rs.25000 as seed money for meeting their immediate financial needs for investing productive based activities or starting micro enterprises. The seed money is given to SHGs by reconstituting them as Joint Liability Groups (JLGs) consists of five members, and the seed money have to be repaid with in eighteen equal instalments. For enhancing production, the individual financial assistance is given to farmers under the programme.

In the consolidation and withdrawal phase, people participation is in the form of propagation of successful activities, participation of watershed Grama Sabha for evaluation etc. Further, for ensuring the sustainability of the programme, people participation is essential during the post project period in the form of proper maintenance of community assets created under the programme. To be sum up that community participation is the foundation of IWMP.

### **Literature Review**

(Singh, 1999) observed that participatory watershed approach not only protect and conserve environment but also contribute to rural livelihood security. Participative and collective actions are basic ingredient of watershed management programmes. Participatory watershed projects enhanced soil moisture content, productivity and cropping intensity, control on soil erosion, increased water storage capacity and increasing the ground water recharge. Due to enhance of rural employment, migration rate was reduced significantly. The role of community organisations has a decisive role in determining the extent of participation of the community.

(Wani, 2005) identified that conventional watershed approach focused only on soil and water conservation measures so that there was no significant impact on production and on the socio-economic status of rural community. Watershed management with community participation would have significant scope for bringing favourable changes in dry lands and rain fed regions. The study concluded that holistic systems with participatory approach through integrated watershed management could enhance productivity and improve livelihoods of the rural poor.

(Nagaraja et al 2015) made a critical analyse of Integrated Watershed management programme in India. The study found that participatory approach of Integrated Watershed

Management Programme in India had a positive impact on agro-economy and socio-capacity building feature of the rural people in India. The study suggested that the state Government could require being more efficient in utilizing the fund released for strengthening the administrative-implementation chain.

### **Methodology and Sampling**

The study was designed as descriptive and analytical in nature. Data for the study was collected from primary and secondary sources. The primary data for the study was conducted with help of well-structured interview schedule. The questionnaire was designed by following Likert's five point scale. Data for the study was collected from a randomly selected sample of 150 respondents from Ranni block panchayat, Pathanamthitta district. The respondents consist of 88 female and 62 male.

The secondary data was collected from various published sources such as journals, periodicals, annual report etc.

### **Objective of the Study**

The study aims at analysing the level of community participation in various activities of IWMP. The level of community participation in the preparatory phase, watershed works phases and consolidation and withdrawal phases has measured using Likert Five point scale. In the subsequent section, an assessment is carried about whether any significant difference in participation of beneficiaries among different age groups and occupations. The specific objective of the study is:

- To evaluate the community participation in various phases of IWMP.

The following hypotheses were formulated for evaluating the frequency of community participation in the preparatory phase, watershed works phase and consolidation and withdrawal phase of the programme

#### **Hypothesis 1**

**H0:** There is no significant difference between sample mean score and average mean with regard to community participation in IWMP

**H1:** There is significant difference between sample mean score and average mean score of with regard to community participation in IWMP

For evaluating the community participation in various phases of the programme, the respondent's response was measured in Likert five point scales. As the frequency of participation was measured, the scale was ranged from five for Always to One for Never.

**One sample t-test** was used to evaluate the level of participation of beneficiaries. Since the responses were measured in 5-point scale, its mean value is 3.00. Therefore, **3.00 were taken as test value.**The Table 1 shows community participation in various phases of IWMP.

**Table 1**

**Community Participation in Various Phases of IWMP**

<b>Preparatory Phase</b>	<b>df</b>	<b>Mean</b>	<b>SD</b>	<b>t</b>	<b>Sig</b>
Participate by assisting officials in constituting NHGs, UGs and SHGs	149	3.95	1.070	17.340	0.000*
Participate in Focus Group Discussion for assisting officials to select watershed and watershed works during the preparation of DPR	149	3.77	0.764	19.170	0.000*
Participate in watershed Grama Sabha for selection and approval of watershed works and the selection of beneficiaries	149	3.89	0.971	17.654	0.000*
Participate in Entry Point Activities for assisting officials to make aware and ensure participation of watershed community	149	3.31	1.244	3.619	0.000*
<b>Watershed Works Phase</b>					
Participate in Natural Resource Management works	149	4.12	1.075	20.546	0.000*
Participate in SHG based or individual based livelihood or production enhanced activities	149	4.13	1.074	20.895	0.000*
Participate by contributing land, labour, money or animal	149	3.66	0.902	13.494	0.000*
Participate in review meeting during the interval of implementation stage	149	3.84	0.859	18.700	0.000*
<b>Consolidation and Withdrawal Phase</b>					
Participate in watershed Grama Sabha for evaluating the completed work	149	3.52	1.23	8.133	0.000*
Participate by assisting officials to prepare documentation of completed work	149	3.38	1.05	5.839	0.000*
Participate in maintenance of created asset by programme	149	2.76	0.873	-8.473	0.000*
Participate by assisting officials to propagate successful works and stories among public	149	2.61	0.537	-19.924	0.000*

*Source: Survey Data*

*\*Significant at 5 per cent level*

### Preparatory Phase

In preparatory phase, the community participation is evaluated in response of the respondents against four statements. In preparatory phase, the highest community participation is found in *Participate by assisting officials in constituting NHGs, UGs and SHGs* ( $\bar{X}=3.95$ ), *Participate in watershed Grama Sabha for selection and approval of watershed works and the selection of beneficiaries* ( $\bar{X}=3.89$ ), *Participate in Focus Group Discussion for assisting officials to select watershed and watershed works during the preparation of DPR* ( $\bar{X}=3.77$ ), and *Participate in Entry Point Activities for assisting officials to make aware and ensure participation of watershed community* ( $\bar{X}=3.31$ ). The result shows that majority of the beneficiaries were often participated in the programme as the entire four statements sample mean scores about community participation in the preparatory phase is greater than the average mean score 3.00. Further, the t value is observed significant at 5 per cent level ( $P<0.05$ ) (Table 1).

### Watershed Works Phase

In watershed works phase, the means of community participation is categorised into four statements. The highest mean score indicate more participation. The community participation in this phase is found higher in *Participate in SHG based or individual based livelihood or production enhanced activities* ( $\bar{X}=4.13$ ), followed by *Participate in Natural Resource Management works* ( $\bar{X}=4.12$ ), *Participate in review meeting during the interval of implementation stage* ( $\bar{X}=3.84$ ), and *Participate by contributing land, labour, money or animal* ( $\bar{X}=3.66$ ). The mean scores of four statement shows that there was active participation of community in this phase. The t value is found significant at five per cent level and all the four sample mean scores are higher than the average mean score ( $P<0.05$ ) (Table 1).

### Consolidation and Withdrawal Phase

The respondent's opinion about community participation in these phases recorded against four statements. The community participation is found higher in; *Participate in watershed Grama Sabha for evaluating the completed work* ( $\bar{X}=3.52$ ), followed by *Participate by assisting officials to prepare documentation of completed work* ( $\bar{X}=3.38$ ), and the mean score of these two statement is more than average mean score. Therefore, majority of the beneficiaries were often participated in the above activities and the t value is found significant at five per cent level ( $P<0.05$ ). While *Participate in maintenance of created*

*asset by programme* ( $\bar{X}=2.76$ ) and *Participate by assisting officials to propagate successful works and stories among public* ( $\bar{X}=2.61$ ), the sample mean scores of the two statements were lower than average mean, therefore, the beneficiaries were sometimes participated in that activities. The lower participation in this phase may due to ignorance of importance of maintenance of asset created during the project and or importance of propagation of successful stories among public. Further, the t value is found significant at five per cent level ( $P<0.05$ ) (Table 1).

It may conclude that the community participation is very high in watershed works phase or implementing phase, followed by preparatory phase. Meanwhile, community participation in the consolidation and withdrawal phase is comparatively lower than other two phases of the programme (Table 1).

### **Community Participation with respect to Age and Occupation**

The IWMP has been designed in such a way which encourages people's participation in all the three stages of the project. Since the programme intimately linked with people, their socio-economic background has a decisive role in determining the success of the programme. The community participation in the programme may vary with respect to age and occupation of beneficiaries. In this session, for analysing community participation in the three phases of the programme, beneficiaries are divided into two categories on the basis of their age and occupation.

For the present study, beneficiaries were classified into four age groups such as Below 30-39, 40-49, and 50 and Above age groups. In occupation wise, beneficiaries were classified in to five groups such as Agriculture (Plants), Animal Husbandry, MGNREGS worker/Agriculture Labour, Daily worker other than Agriculture Labour and MGNREGS, and those who have engaged in occupation other than the above are included in 'Others'.

As the dependent variables are taken together as a bundle in the three phases, MANOVA model is suitable here. To assess the statistical significance of age and occupation in the level of participation of programme, the following hypotheses may be formulated and statistically tested with MANOVA.

### **Hypotheses 2**

**H<sub>0</sub>:** There is no significant difference in the participation in various phases of IWMP among beneficiaries under different age group.

**H1:** There is significant difference in the participation in various phases of IWMP among beneficiaries under different age group.

### Hypotheses 3

**H0:** There is no significant difference in the participation in various phases of IWMP among beneficiaries under different occupations.

**H1:** There is significant difference in the participation in various phases of IWMP among beneficiaries under different occupations.

### Age wise Participation

The participation of beneficiaries in the programme may vary with respect to age of beneficiaries. The Table 2 displayed the estimated marginal means of age wise participation.

**Table 2**  
**Estimated Marginal Means for Age wise Participation**

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
PREPARATORY PHASE	BELOW 30	21.545	.593	20.079	23.011
	30-39	24.499	.529	23.852	25.145
	40-49	25.611	.384	25.051	26.171
	50 AND ABOVE	<b>27.694</b>	.525	26.816	28.572
WATERSHED WORKS PHASE	BELOW 30	54.540	2.273	49.876	59.205
	30-39	63.203	1.157	60.587	65.820
	40-49	<b>68.088</b>	1.274	66.287	69.890
	50 AND ABOVE	65.916	2.257	62.177	69.656
CONSOLIDATION AND WITHDRAWAL PHASE	BELOW 30	21.551	.670	20.930	22.172
	30-39	22.104	.383	21.354	22.854
	40-49	<b>23.537</b>	.517	22.518	24.555
	50 AND ABOVE	23.275	.330	22.625	23.925

Source: Survey Data

The community participation in the preparatory phase, watershed works phase and consolidation and withdrawal phase were percented and based on the highest mean score (27.694) response of the selected beneficiaries, it may be observed that those who have **50 and above** age group has more participation in the preparatory phase as compared to other age groups, in the watershed works phase and consolidation and withdrawal phase, more

participation was observed among **40-49 age group**, as the mean scores (68.088 and 23.537) of selected beneficiaries were higher than the other age group (Table 2).

### Occupation wise Participation

There may be difference in participation among different occupations in the programme. The table 3 exhibits the estimated marginal means of occupation wise participation.

**Table 3**  
**Estimated Marginal Means for Occupation wise Participation**

Dependent Variable	Occupation	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
PREPARATORY PHASE	Agriculture (plants)	<b>29.381</b>	.534	28.222	30.541
	Animal husbandry	27.105	.618	25.783	28.426
	MGNREGS worker	26.008	.551	23.622	28.394
	Self-employment/business	26.734	.550	24.680	28.799
	Daily worker other than agriculture labour and MGNREGS	25.979	.570	24.355	27.602
	Others	23.001	.534	22.947	25.162
WATERSHED WORKS PHASE	Agriculture (plants)	<b>68.445</b>	1.615	67.642	69.248
	Animal husbandry	64.423	2.217	61.459	67.386
	MGNREGS worker	62.023	2.178	58.744	65.302
	Self-employment/business	59.88	2.613	54.775	65.005
	Daily worker other than agriculture labour and MGNREGS	61.966	2.770	57.036	66.895
	Others	59.151	2.732	53.804	64.499
CONSOLIDATION AND WITHDRAWAL PHASE	Agriculture (plants)	<b>25.598</b>	.338	24.834	26.361
	Animal husbandry	22.345	.585	21.393	23.297
	MGNREGS worker	21.890	.623	21.362	22.417
	Self-employment/business	20.235	.624	19.351	21.119
	Daily worker other than agriculture labour and MGNREGS	19.680	.645	18.375	20.984
	Others	21.894	.652	20.859	22.929

Source: Survey Data

The test result shows that those who have **agriculture** as the main occupation has participated more in the preparatory phase, watershed works phase and consolidation and withdrawal phase as the mean scores of agriculture is found to be very high in preparatory phase (29.381), watershed works phase (68.445) and consolidation and withdrawal phase (25.598) as compared to mean scores of other occupations (Table 3).

The table 4 exhibits Test of between-subjects effects of age and occupation wise community participation.

**Table 4**  
**Tests of Between-Subjects Effects of Community Participation**

Source	Dependent Variable	Type I Sum of Squares	df	Mean Square	F	Sig.
AGE	Preparatory phase	299.820	3	99.607	6.228	.000*
	Watershed works phase	9294.733	3	3097.578	8.643	.000*
	Consolidation and withdrawal phase	343.761	3	103.587	6.416	.001*
OCCUPATION	Preparatory phase	995.257	5	199.251	13.458	.000*
	Watershed works phase	4417.886	5	883.777	2.752	.018*
	Consolidation and withdrawal phase	594.084	5	118.417	5.385	.000*
Total	Preparatory phase	8124.643	141			
	Watershed works phase	164637.612	141			
	Consolidation and withdrawal phase	10791.816	141			

Source: Survey Data

\*Significant at 5 per cent Level

**Table 5**  
**General Linear Model Multivariate Tests for Community Participation**

Effect		Value	F	Hypothesis df	Error df	Sig.
AGE	Pillai's Trace	.093	4.970	9.000	1393.000	.000*
	Wilks' Lambda	.908	5.064	9.000	1125.537	.000*
	Hotelling's Trace	.100	5.123	9.000	1387.000	.000*
	Roy's Largest Root	.083	12.848 <sup>c</sup>	3.000	468.000	.000*
Occupation	Pillai's Trace	.156	5.074	15.000	1397.000	.000*
	Wilks' Lambda	.847	5.282	15.000	1273.780	.000*
	Hotelling's Trace	.179	5.481	15.000	1383.000	.000*
	Roy's Largest Root	.163	15.092 <sup>c</sup>	5.000	462.000	.000*

Source: Survey Data

\*Significant at 5 per cent level

From the multivariate test, the mean score variation of age group and occupation group were tested with MANOVA model and it was found that the value of F (4.970 and 5.074

respectively) characterised by Pillai's Trace were found to be significant at 5 per cent level ( $P < .05$  in both cases). Therefore, it may be inferred that there is significant difference in the participation of selected beneficiaries in the preparatory phase, watershed works phase and consolidation and withdrawal phase among different occupation and age category of beneficiaries (Table 5).

In 2015, the Integrated Watershed Management Programme amalgamated with Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), and IWMP shifted to a new platform known Watershed Development Component (WDC-PMKSY). Now all the activities under IWMP go on in the new platform, WDC-PMKSY (SLNA, 2015).

### **Conclusion**

Integrated Watershed Management Programme is a participatory watershed management programme launched in India in 2008-09 for the sustainable development of rural community. The community participation in IWMP implemented by Ranni Block Panchayat was selected for study and from the study it was finding out that, with regard to participation in the preparatory phase, majority of the beneficiaries participated in assisting officials in constitution of SHG, UGs; watershed Grama Sabha for selection and approval of watershed works, Entry Point Activities and Focused Group Discussion. In watershed works phase, the major participation were found in livelihood activities, production enhancement activities, NRM works, and participation in review meeting at the interval of implementation. In consolidation and withdrawal phase, the highest participation were found in evaluating the completed work, followed by assisting officials to prepare documentation of completed work. At the same time, level of participation was poor in maintenance of asset created under the programme, and propagation of successful watershed activities among public. The study found out that there were significant difference in participation in preparatory phase, watershed works phase and consolidation and withdrawal phase with respect to age and occupation of beneficiaries.

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