Impact of Entry Point Activities (EPAs) on Changes of Socio-economic Conditions of Watershed community inthe Devipatnam Mandal ofEast Godavari District, Andhra Pradesh

ABSTRACT:

The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) watershed development program was implemented in the Devipatnam mandal of the west Godavari district of Andhra Pradesh.Introducing watershed development programs to the community through Entry Point Activities (EPAs) has always been recognized as an important activity. The Entry Point Activities (EPAs) were implemented to establish togetherness with the community, strengthening and sustaining it throughout the program and beyond. The present study focused on the assessment of outcomes from Entry Point Activities and their impact on changes inthe socio-economic conditions of the watershed community. The study covered two PMKSY Projects covering four micro watersheds of batch-V sanctioned in Devipatanm mandal of East Godavari district in Andhra Pradesh. Stratified random sampling was adopted for this study covering 5% of households out of the total households in the study area. Three types of EPAs (RO Plant, Tent houses and Solar street lights) were executed in PMKSY project areas which bring changes in the socio-economic conditions of the watershed community.

KEYWORDS: Entry Point Activities (EPAs), Gross household income, Migration, Watershed community, Family expenditure

1. INTRODUCTION:

India is predominantly a ruralbased agrarian country where agriculture alone employs more than 50% of the total population. Agriculture and allied sectors such as horticulture, livestock, forestry, and fisheries together contribute 17.8% of the country's Gross Value Added for the year 2019-20 [1]. Therefore it is understood that for the economy of the country to thrive and remain healthy, agriculture must be duly taken care of. For sustainable agricultural production of the country irrigation through a permanent water source or rainfall needs to be available. As per the Indian Statistics, 53% of the net sown area in the country is rainfed [2]. Therefore it implies that all efforts need to be aimed to address the problems of the rain-fed areas. Despite India ranking first in rainfed agriculture globally in terms of area and production, productivity is among the lowest in the world. This is due to issues like the reduction of natural resources, rainwater runoff, soil erosion, and poor quality of soils and water. To address these issues an Integrated Watershed Management approach is found to be an appropriate solution worldwide. It is one of the most effective interventions used to stabilize rainfed agriculture by providing sources of water for small-scale irrigations. It is one of the flagship programs of the Government with substantial budget allocation for poverty alleviation of the rain-fed farmer. The Integrated Watershed Management Programme (IWMP) after approval of PMKSY (Pradhan Mantri Krishi Sinchaee Yojana) is subsumed as one of its components and IWMP is now implemented as WDC-PMKSY w.e.f. 01.07.2015. Department of Land Resources (DOLR) under the Ministry of Rural

Development (MoRD) has been implementing the PMKSY-Watershed Programme since 2009. In Andhra Pradesh, the Department of Panchayat Raj and Rural Development through the State Level Nodal Agency (SLNA) is implementing 372 watershed projects covering an extent of 15.83 lakh hectares in five batches from 2009-10 to 2013-14.

The main objective of the PMKSY-Watersheds is to improve water conservation, irrigation facility and land use pattern which would lead to an improved biophysical and socio-economic environment through increased agriculture productivity in rainfed areas. The benefits due to watershed development activities include improved crop yields, employment generation and augmentation of income of the project area's inhabitants. In the project areas, there is an increased focus on the sustainable use of water and other natural resources[3-4].

The main objectives of the present study are to analyze the outcome of EPAs and the impact of Entry Point Activities (EPAs) of watershed projects on changes insocio-economic conditions of the watershed community in Choppakonda and Pamugandiof Devipatnam mandal in West Godavari district, Andhra Pradesh. The socio-economic indicators viz. drinking water supply, gross household income, family expenditure, community participation,and migration from rural to urban areas were studied for impact assessment of watershed interventions. The main reason for selecting the watersheds of Batch-V (2013-14) in East Godavari district is the projects that have been completed and the project period of treatment with various interventions.

1.A STUDY AREA:

Devipatnam is a Town and Mandal in the East Godavari District of Andhra Pradesh. According to census 2011 information, the total area of devipatnam mandal is 342 square kilometers. Devipatnam mandal has a total population of 28,178. Out of which 13,669 are males while 14,509 are females. According to the 2011 Census, a total of 8,711 families were residing in Devipatnam Mandal. The average sex ratio of Devipatnam mandal is 1,061.Devipatnam mandal has a population density of 82.33 inhabitants per square kilometer. When it comes to literacy, 53.52% population of Devipatnam mandal is literate, out of which 57.94% of males and 49.36% of females are literate. There are about 46 villages in Devipatnam mandal.

The Choppakonda and Pamugandimega watershed projects of PMKSY sanctioned for 2013-14 were implemented by the Government of Andhra Pradesh in Devipatnam mandal of East Godavari district with a sanctioned area of 4866 hectares encompassing 4 Micro Watersheds with a fund allocation of 729.90 lakhs. The projects are completed after 7 years of implementation in 3 (preparatory, work and consolidation) phases. The total geographical area of the two mega watersheds is 6551 hectares. The Choppakonda mega watershed project is located between latitude 81°42'31" and longitude 17°23'21" at ridge point and between latitude 81°42'36" and longitude 17°23'18" at valley point, Pamugandi mega watershed project is located between latitude 81°43'55" and longitude 17°24'21" at ridge point and between latitude 81°43'65" and longitude 17°24'18" at valley point.

1.B. Entry point activities of watersheds implemented by the PMKSY project:

Out of the total budget allocated to IWMP projects, 28.71 lakhs (4%) earmarked for the EPA component is allocated to 2 IWMP projects (Batch-V), covering 4 Micro Watersheds (MWS). Against this, the estimate was prepared and sanctioned accorded for 21 no. of EPAs with an amount of 25.14 lakhs. All 21 EPAs sanctioned are completed by incurring a total expenditure of 24.96(99.28%) lakhs

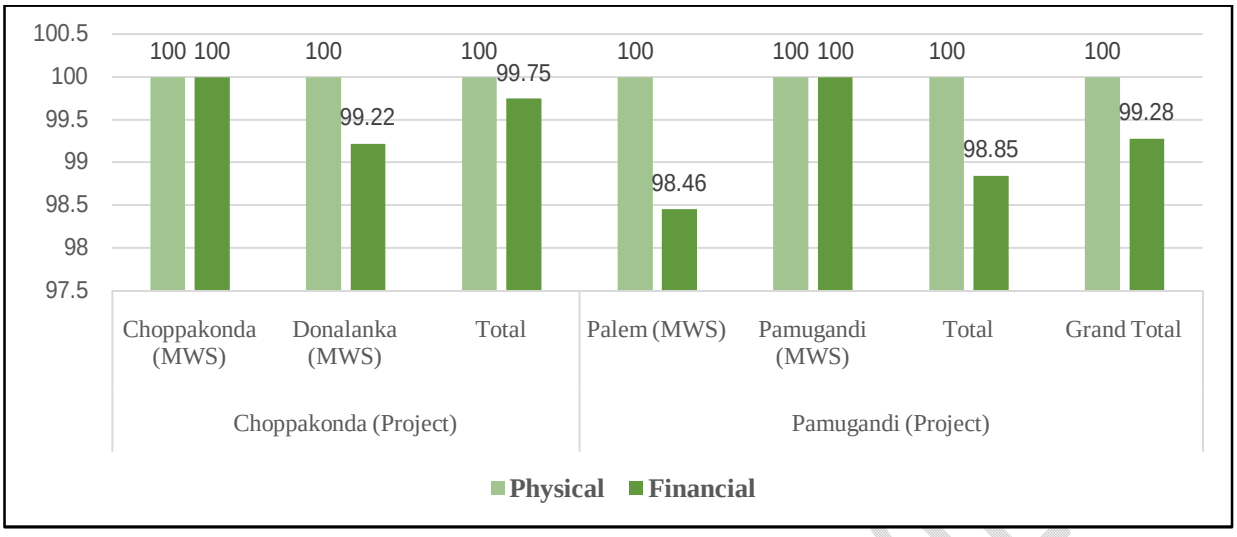
Under the component of EPAs, three types of activities namely R.O Plant, Tent Houses and Solar street lights were executed in study watershed projects. The activity-wise abstract of physical and financial targets and achievements are given in Table-1 and Fig-1. In terms of expenditure, a maximum amount of 24.96 (99.28%) lakhs were incurred on the RO Plant, Tent houses and solar street lights in the Choppakonda and Pamugandi Project areas.

The number of EPAs targeted and undertaken along with details of estimated cost and expenditure in each IWMP project are shown in Table-1. In the two projects, 100 % of the physical target is achieved. The expenditure incurred in all the projects is lower than the estimated amount. In the Choppakonda project, an amount of 12.08 (99.75%) Lakhs was incurred against an estimated cost of 12.11 lakhs; while in the Pamugandiproject, an amount of 12.88 (98.85%) Lakhs was incurred against an estimated cost of 13.03 lakhs. In two projects, an amount of 24.96 (99.28%) Lakhs was incurred against the estimated cost of 25.14 lakhs.

Table 1. Micro Watershed wise physical and financial progress of Entry Point Activities

S.No	Projects	Micro Watersheds	Name of EPAs	Target		Achievement	
				Physical (Number)	Financial (Lakhs)	Physical (Number)	Financial (Lakhs)
1	Choppakonda	Choppakonda	Solar Street Light	5	2.91	5	2.91
			Tent House	2	5.34	2	5.34
			Sub-Total	**7**	**8.25**	**7**	**8.25**
		Donalanka	Solar Street Light	2	1.46	2	1.46
			Tent House	1	2.4	1	2.37
			Sub-Total	**3**	**3.86**	**3**	**3.83**
			Total	**10**	**12.11**	**10**	**12.08**
2	Pamugandi	Palem	RO Plant	1	2.92	1	2.77
			Solar Street Light	7	6.8	7	6.8
			Sub-Total	**8**	**9.72**	**8**	**9.57**
		Pamugandi	Solar Street Light	2	0.97	2	0.97
			Tent House	1	2.34	1	2.34
			Sub-Total	**3**	**3.31**	**3**	**3.31**
			Total	**11**	**13.03**	**11**	**12.88**
Grand-Total				**21**	**25.14**	**21**	**24.96**

Figure 1. Physical and financial progress of Entry Point Activities (%)



2. MATERIAL AND METHODS

Sample selection:

Stratified random sampling was adopted for this study. Sample households were randomly selected from the watershed community including OC, BC, SC, ST, and minorities, women-headed households, landless households, marginal, small and big farmers representing all hamlets/villages in each micro watershed [5-7].

Sample size:

In two mega project areas, five percent of households were selected fromthe total households. Out of 826 households in two projects, a total of 41 households (5%) were selected.

Table 2. Distribution of Sample households according to Micro Watersheds

Sl. No.	Name of IWMP	Name of the MWS covered	No. of Households evaluated during the pre-project period	5% of households randomly assessed during the post-project period
1	Choppakonda	Choppakonda	269	13
		Donalanka	154	8
		Total	**423**	**21**
2	Pamugandi	Palem	200	10
		Pamugandi	203	10
		Total	**403**	**20**
Grand Total			**826**	**41**

Data collection:

The survey-based approach was adopted in the present study. Two participatory methods used in the data collection were survey and focused group discussions. Primary data was collected from five (5) percent sample households from the families in Detailed Project Report (DPR) for both pre and post-project periods. Secondary information was collected from the unpublished records of WCCs, the web portal of PMKSY projects of the Government of Andhra Pradesh and journals. Focused group discussions (FGDs) were conducted in all 4 micro watersheds of two watershed projects with the support provided by the staff of respective micro watersheds. The participants in the discussion were Sarpanches, Members of Gram Panchayat, the Watershed Committee, User Groups, Village organizations and watershed assistants.

Analytical Techniques and Methods:

The present study used to average and percentage techniques to study the impact of EPAs of watersheds on socio-economic indicators viz. drinking water supply, gross household income, family expenditure, community participation and migration from rural to urban areas were studied for impact assessment of EPAs of watersheds.

3. RESULTS AND DISCUSSIONS:

The present study is focused mainly on the outcomes of EPAs and changes inthe socio-economic conditions of the watershed community in the study area. The impacts of EPAs wereassessed and the results are presented below under different categories for discussion to arrive at valid conclusions.

3. Outcomes of EPAs:

R.O. Plant: R.O. plant was installed at Palem Micro Watershed in the Pamugandi project to provide safe drinking water to the watershed community[5-7].

Image 1: RO Plant at Palem Micro Watershed

Image 2: Tent House at Choppakonda Micro Watershed

Tent House: It is noted as a viable and sustainable activity for rendering service to thewatershed community and earning net income by the group beneficiary, more particularly the vulnerable groups for their livelihoods as well. The tent house services covered many local events like wedding functions, folk festivals, family functions and other local community-based events.

These events had direct and indirect impacts on communities. They provided opportunities for participation, volunteering, social, and cultural development. The benefits from all these community activities are extensive. They contributed to the quality of life by strengthening communities, helping in building awareness of diverse cultures and identities, and acting as a source of community pride[5-7].

Solar Street Lights: The solar street lights were taken up as an EPA in two watershedvillages in Devipatnam mandal. Solar lighting is one of the core EPA activities in watershed villages. Solar street lighting provided several important benefits to the community by way of increasing the quality of life by artificially extending the hours in which it is light so that activity can take place. Street lighting also improved safety for tractor drivers, two-wheel riders, and pedestrians, since power cuts from conventional sources of energy are a general phenomenon till recently. Improved street lighting helped the community, as it is a deterrent for any possible theft or crime. Solar street lights are environment-friendly and are safer for community children and animals than conventional street lights[5-7].

5.B. SOCIO-ECONOMIC IMPACT:

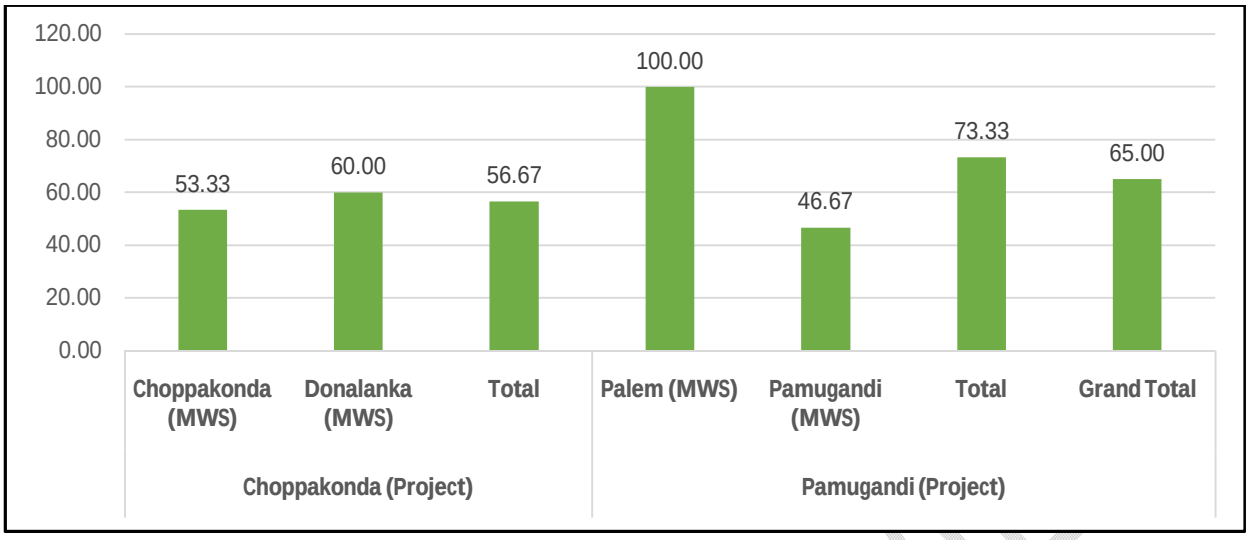
Drinking water:

Table.3 shows the availability of drinking water by sample households of the project areas after the project period. The availability of safe and clean drinking water is necessary for a healthy life. An attempt was made to study the availability of clean drinking water to the beneficiaries. The drinking water supplies improved by 56.67% in the post-project period from 315 to 491 ltr/day in the Choppakonda project and improved by 73.33% in the post-project period from 300 to 520 ltr/day in the Pamugandi project respectively. In all, the drinking water supplies improved by 65.00% in the post-project period from 615 to 1011 ltr/day due to watershed interventions which are adequate to meet the requirement of the population. Especially, increased (100%) drinking water availability in Palem Micro Watershed due to the new R.O. Plant installation. Community in watershed areas perceived increased access to safe and purified drinking water, reduced risks of water-borne infectious diseasesand improved general health.

Table. 3Distribution of availability of drinking water (Ltr/day) by sample households

Sl. No.	Name of Project	Name of MWS	Pre-Project	Post Project	Increased
			l/day	l/day	l/day
1	Choppakonda	Choppakonda	195	299	104
		Donalanka	120	192	72
		Sub-Total	**315**	**491**	**176**
2	Pamugandi	Palem	150	300	150
		Pamugandi	150	220	70
		Sub-Total	**300**	**520**	**220**
		Total	**615**	**1011**	**396**

Figure.2 Availability of drinking water (ltr/day)



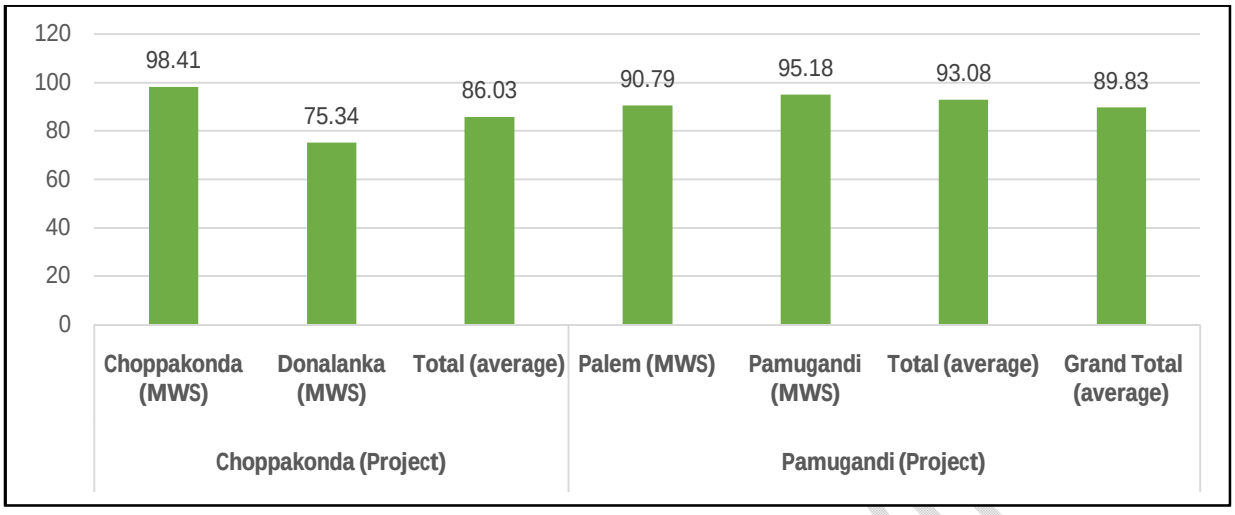
Gross Income of Households:

Table.4indicates the mean gross income of households in the project areas after the project period. The gross income of households was increased constituting Rs.0.59 lakhs (86.03%) in the Choppakonda project area. In the Pamugandi project area, the gross household income increased constituting Rs.0.74 lakhs (93.08%). The annual gross income of the Watershed Committees was also increased through RO Plant and Tent houses. The committees are collecting nominal money from the community by utilizing water from the R.O. plant and material from Tent houses for the committee's sustainability and maintenance [5-7].

Table.4 Micro watershed-wise gross household income per anum (Rs.in Lakhs)

Sl. No.	Name of Project	Name of MWS	Pre-Project (Rs.in Lakhs)	Post Project (Rs.in Lakhs)	Increased (Rs.in Lakhs)
1	Choppakonda (Project)	Choppakonda	0.63	1.25	0.62
		Donalanka	0.73	1.28	0.55
		Total	**0.68**	**1.27**	**0.59**
2	Pamugandi (Project)	Palem	0.76	1.45	0.69
		Pamugandi	0.83	1.62	0.79
		Total	**0.80**	**1.54**	**0.74**
		Grand Total	**0.74**	**1.40**	**0.66**

Figure.3 Micro watershed wise gross household income increased per anum (%)



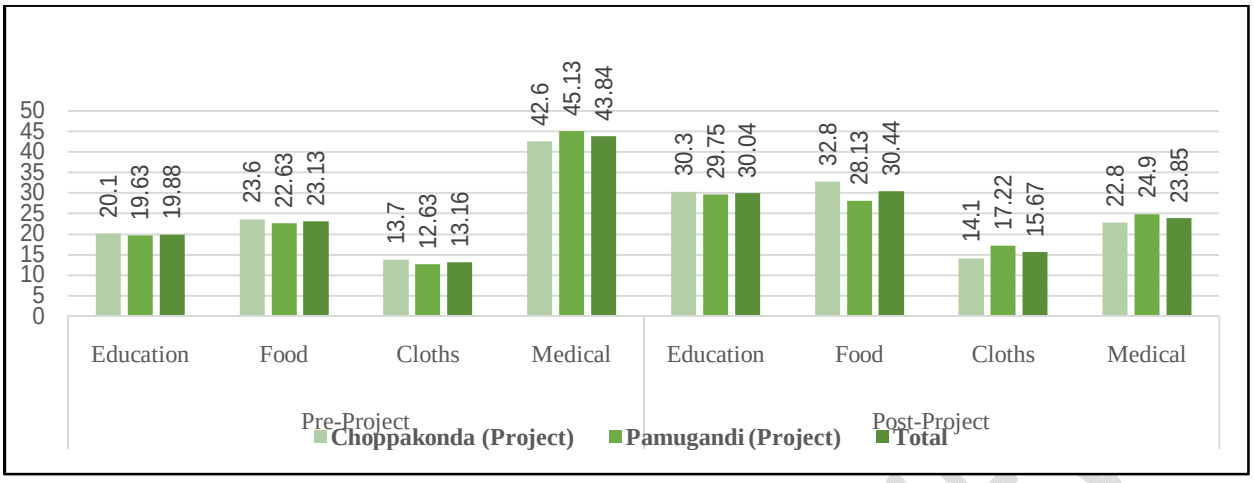
Family Expenditure:

Table.5 shows the family expenditure details of sample households in the project areas after the project period. Family consumption expenditure is also another important parameter that indicates the standard of living of an individual. Before the project period, respondents had given priority expenditure on medical (43.84%), food (23.13%), education (19.88%) and clothes (13.16%) respectively. After the project period, the percentage of expenditure on education (30.04%), food (30.44%) and clothes (15.67%) were raisedbecause of the increase in income and availability of safe drinking water which indicates the enhancement in the standard of living and improved the health conditions due to safe drinking water and quality nutrition.

Table.5 Family expenditure details (%)

Sl. No.	Name of Project	Name of MWS	Pre-Project				Post-Project			
			Education	Food	Cloths	Medical	Education	Food	Cloths	Medical
1	Choppakonda	Choppakonda	21.0	23.0	13.0	43.0	31.4	31.3	15.3	22.1
		Donalanka	19.3	24.3	14.4	42.1	29.3	34.3	13.0	23.5
		Total	**20.1**	**23.6**	**13.7**	**42.6**	**30.3**	**32.8**	**14.1**	**22.8**
2	Pamugandi	Palem	18.3	21.3	12.3	48.3	30.3	28.0	16.7	25.0
		Pamugandi	21.0	24.0	13.0	42.0	29.3	28.3	17.7	24.8
		Total	**19.63**	**22.63**	**12.63**	**45.13**	**29.75**	**28.13**	**17.22**	**24.90**
		Grand Total	**19.88**	**23.13**	**13.16**	**43.84**	**30.04**	**30.44**	**15.67**	**23.85**

Figure.4 Family expenditure details (%)



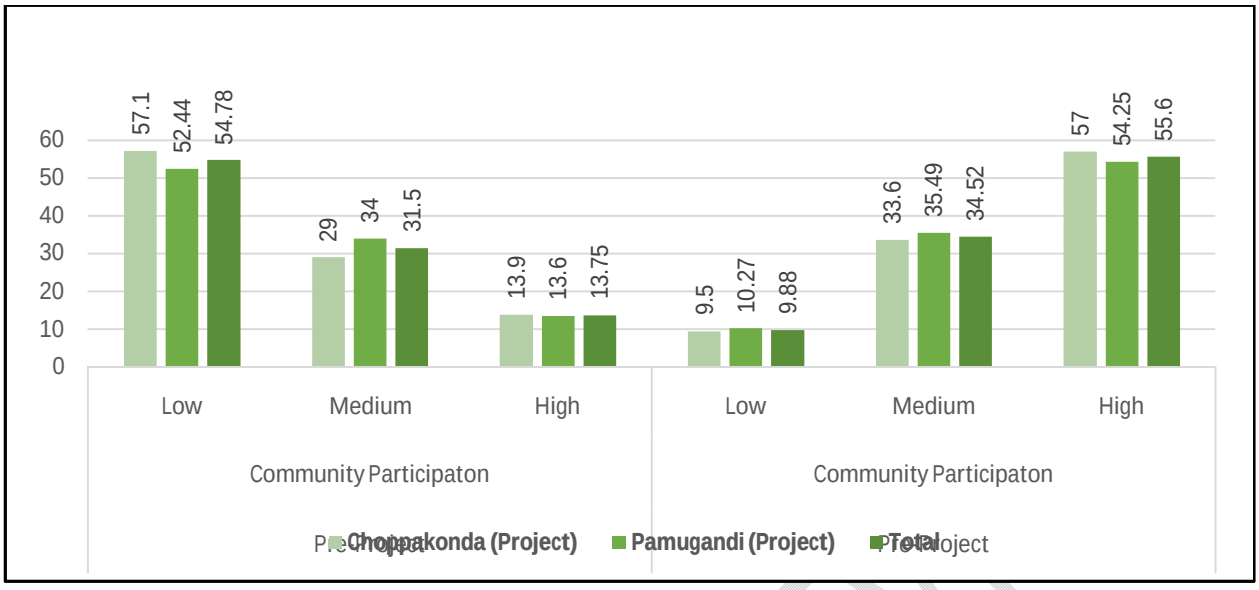
Community participation:

Table.6 shows the level of community participation in the operation and maintenance of the common properties. Like all other development programs, watershed development also banks heavily on the participatory approach. Though the watershed development program envisages an integrated and comprehensive plan of action for rural areas, peoples' participation at all levels of its implementation is very important. As the issue of sustainable natural resource management becomes more and more crucial, it has also become clear that sustainability is closely linked to the participation of the communities who are living in close association with these natural resources.Community participation can be judged in terms of giving time to the project and contribution in cash/or kind towards works, both on the development and management of private and common property resources. Before the project period, the community had given low priority 54.78 percent, medium priority 31.50 and high priority 13.75 percent to the operation and maintenance of the common property resources. After the project period, the community contributed low priority 9.20 percent, medium priority 34.52 and high priority 55.60 percent to the operation and maintenance of the common properties like RO Plant, Tent houses and Solar street lights due to awareness and strengthening the community by PMKSY project.

Table.6 Community participation in Watershed management

Sl. No.	Name of Project	Name of MWS	Pre-Project			Post-Project		
			O&M			O&M		
			Low	Medium	High	Low	Medium	High
1	Choppakonda (Project)	Choppakonda	59.0	29.0	12.0	10.0	31.0	59.0
		Donalanka	55.2	29.0	15.8	9.0	36.1	54.9
		Total	**57.1**	**29.0**	**13.9**	**9.5**	**33.6**	**57.0**
2	Pamugandi (Project)	Palem	49.6	37.3	14.2	11.3	39.2	49.5
		Pamugandi	56.0	31.0	13.0	9.2	31.8	59.0
		Total	**52.44**	**34.00**	**13.60**	**10.27**	**35.49**	**54.25**
		Grand Total	**54.78**	**31.50**	**13.75**	**9.88**	**34.52**	**55.60**

Figure.5Community participation in Watershed management



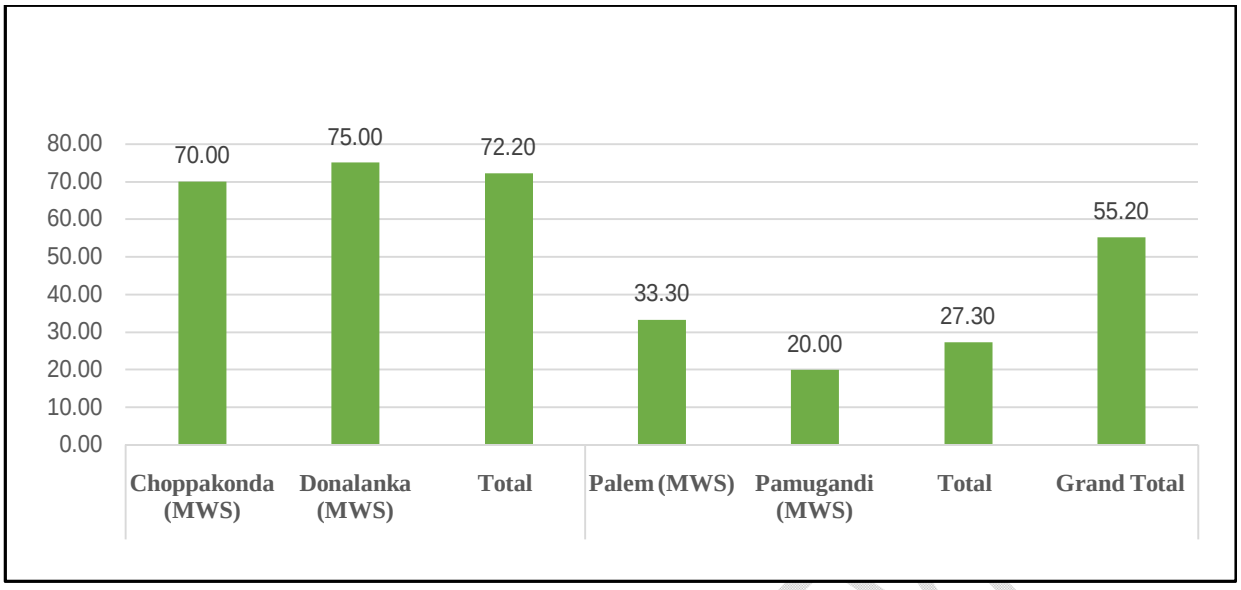
Impact on out-migration:

Table.7 indicates the reduction in migration details from rural to urban areas. The status of migration is one of the indicators of assessment of a rural development project. The decrease in migration indicates the success of the project in the project area. After the project period, reduced the migration from 18 to 5 persons with (72.20%) from rural to urban areas in the Chppakonda project area and 11 to 8 persons with (27.30%) in the Pamugandi project area. In all, reduced the migration from 29 to 13 (55.20%) from rural to urban areas.Earlier, the villagers used to go either to Hyderabad or Visakhapatnam in search of work and at present due to the creation of on-farm and off-farm employment in the project area people have slowly stopped migrating to other places [8-9].

Table.7Reduction in migration from Rural to Urban area

Sl. No.	Name of Project	Name of MWS	Pre-Project	Post-Project	Reduction
1	Choppakonda	Choppakonda	10	3	7
		Donalanka	8	2	6
		Total	**18**	**5**	**13**
2	Pamugandi	Palem	6	4	2
		Pamugandi	5	4	**1**
		Total	**11**	**8**	3
		Grand Total	**29**	**13**	**16**

Figure.6 Reduction in migration from Rural to Urban area



4. CONCLUSION

Entry Point Activities (EPA) are part of the community mobilization process taken up as short-term initiatives that benefited a larger target group at the village /watershed level to build rapport with the community as well as to ensure their willingness to involve themselves in the project implementation. The project team identified in consultation with the villagers, the most felt need or problems of the community to fulfill or resolve the same by identifying appropriate activities or creation of common assets for the benefit of the community at large. In general, community participationin project implementation has been a great success. The EPAs were executed 100% against the target. The communities have been participating actively in the operation and maintenance of the common properties of the RO plant, Tent houses and Solar street lights. The communities revealed that they are very much appreciative of this component of the project.

COMPETING INTERESTS:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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