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Impact of the PMKSY – Watershed Development Project on Dairy Enterprises Batch IV (2012-13) Projects in YSR Kadapa District, India

P. V. R. M. Reddy^{1*}, B. Janardhan Reddy¹, B. V. Ramana Kumar¹ and R. Jhansi Rani²

¹Watersheds, State Level Nodal Agency, Andhra Pradesh, India

²Remote Sensing Instruments, Hyderabad, India

**Corresponding author*

ABSTRACT

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Before proceeding to analyze the impact of PMKSY watershed projects pertaining to Batch IV in YSR kadapa district, it would be worthwhile to have an idea of the genesis of IWMP, objectives, mode of operandi at state level, etc which forms the basis for clear understanding of the research paper. Watershed based integrated development programme is the basic means for drought mitigation and control of desertification. The concept of integrated land and water management on watershed basis through active involvement of the people which alone could improve the environment and productivity of resources was focused. As per guidelines of DPAP and DDP, micro-watershed should be the management unit and in each selected block the micro-watersheds may be classified into high, medium and low priority areas according to their vulnerability to droughts. Developmental programs stress more on restoration of ecological balance through optimum utilization of natural resources which may disturb the optimum land-man-livestock ratio.

Introduction

At the state level, Commission rate of Panchayath Raj and Rural Development are responsible for implementing the program and District Water Management Agency (DWMA) at district level to implement the program. The watershed consists of micro-watersheds. Watershed Committees are formed for each micro-watershed to prepare developmental plans involving local stakeholders for conserving resources and promoting their efficient

use by adopting appropriate technologies and strategies. The action plans thus developed are approved by DWMA and finally by State Level Nodal Agency (SLNA). The programs thus approved are implemented by the Watershed Committees (WC) in partnership with User Groups (UGs) and Self Help Groups facilitated by Watershed Development Team /Project Implementing Agency. The activities implemented during the project period by State Level Nodal Agency (SLNA) at state level, District Watershed

Management Authority (DWMA) at district level and Watershed Computer Centres (WCC) at mandal level included under Natural Resource Management (NRM) activities which generated various employment opportunities, especially for the rural youth both in farm and non- farm sectors in the study area.

Integrated Watershed Management Program in Andhra Pradesh

The PMKSY-Watershed project is launched with an aim to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water and create sustainable livelihoods for asset less.

The Department of Rural Development implemented watersheds through different programmes viz. Integrated Wastelands Development Programmes, Drought Prone Areas Programme and Desert Development programme. Based on the recommendations of Technical Committee under the Chairmanship of Prof. C. H. Hanumantha Rao, Department of Land resources, Government of India launched new integrated program on watershed development called Integrated Watershed Management Programme (PMKSY-Watershed project) in 2008.

The key features of this Approach

States are empowered to sanction and oversee implementation of watersheds

Identifying dedicated institutions at national, district level for project implementation

Supporting funds are provided for the implementing organizations

Total period of implementation is 4-7 years with different phases

Productivity enhancement and entrepreneurship under livelihood program are given importance

Cluster approach is followed and each cluster would consists of 1000 to 5000 hectares

Remote sensing data is used for scientific planning

Stakeholders and functionaries are provided with capacity building and training

Ridge to valley concept is followed

Study Area

The PMKSY-Watershed project is in operation in all the districts of AP except in Krishna and Nellore districts. The present report deals with the impact evaluation of 7 projects under Batch-IV in YSR Kadapa district which was initiated during 2012-13 and completed in 2019-20. The YSR Kadapa district lies, in the southern part of the state of Andhra Pradesh, between latitude 13°43'N to 15°14'N and longitudes 77°55'E to 79°29'E at an average altitude of 136m above MSL. The district is divided into 51 mandals. Watershed Development under Batch-IV projects is undertaken in 7 mandals through 7 projects. The micro-watersheds are spread over 73 revenue villages comprising of 174 habitations.

The watersheds are developed duly following the guidelines issued by the National Rainfed Area Authority (NRAA) under the Ministry of Rural Development, GOI.

Materials and Methods

Data Collection and Impact Evaluation of the Project

Impact evaluation has been conducted to determine the changes in socio- economic conditions of the stake-holders, agricultural production, livestock production, status of the natural resources, changes in crops and household income as a result of the implementation of the program. To assess the above impacts, all micro-watersheds under each project are covered for the study. Secondary information related to the project is collected from project office and

Watershed Computer Centers (WCC), concerned DPRs and other relevant records using a well designed open-ended format for detecting changes.

In addition 5% of the total households under each micro-watershed are selected on a random basis and surveyed for socio-economic changes as well as changes in land use, crops grown, crop productivity and income. Present values are compared with base values to determine the impacts. In addition focus group discussions were held with stakeholders to capture qualitative information related to project implementation and its impacts and to triangulate the information obtained from secondary sources.

Results and Discussion

Entry Point Activities (EPA)

In all the projects, Entry Point Activities (EPAs) were organized to have a rapport with the community and to create awareness about implementing procedures of various activities under the project. The EPA works like animal health camps, trevices, water purification plants, solar street plants, cattle drinking troughs are taken up. Stakeholders in all the projects have positively responded to these activities.

Production Systems Improvement

The production systems improvement interventions are in agriculture, animal husbandry and allied sectors in convergence with concerned line departments.

The activities like the supply of primary and secondary tillage tractor drawn equipment like cultivators, M B ploughs, seed drills, rotovators, water carrying pipes, oil engines, inter culture equipment like weeders, plant protection equipments like sprayers, drip and sprinkler irrigation systems, tarpaulins, plastic crates are taken up under agriculture sector. Animal husbandry activities like fodder plots, chaff cutters, fertility camps, breeding rams are taken up under animal sector.

Observed Changes by the Completion of Project

The implementation of the program is effective in improving the productivity of the land, bringing additional area under agriculture as well as under irrigation, employment generation of beneficiaries living in the project area.

Numerous initiatives have enabled with watershed projects to protect the natural resources and their restoration. Greening of hillocks is an example of restoring the past glory of plants by contour trenches and drought-resistant plant species on barren hills.

It is observed that, general awareness about resource degradation, health and sanitation is created. This has created increased interest among the community regarding their civic and social responsibilities. In view of increased soil moisture availability more remunerative crops including vegetables are being cultivated as compared to those cultivated during the pre-project period. As a result of such developments in the agriculture sector noticed.

In general, the community feels that artificial insemination helped to increase the proportion of cross-bred animals by 10 to 15%. Animal Health Camps reduced disease occurrence by 15% and all this resulted in enhanced milk productivity. Milch animal population also increased by 41.7% at the end of the project. Green fodder availability increased. Milk production has creased by 32% to 42.6%.

Role of SHG in Watershed Development

Women's self-help groups (SHGs) were first formed in Andhra Pradesh in late eighties with the active initiative of the state government and voluntary development organizations. In the early years, small groups of women met together regularly to save money and to lend to one another. Initially, it was felt that when the group savings reached a significant level, matching grants would be given, and the group could rotate those, too, as credit, among members. As a result of the Indira Kranthi

Patham (IKP) (previously known as VELUGU) initiated by the government, the numbers of SHGs grew at a faster pace than had initially been anticipated, and the amount of savings, too, overtook too quickly the Rs 10,000 limit that was being allocated as matching grant per group. Meanwhile, SHGs also became actively involved with several non-financial interventions in their villages, and federations of SHGs began to be formed.

By 1992, it became clear that if members of SHGs intended to continue saving and accessing credit, then SHGs had to be helped to access credit from mainstream financial agencies. In 1996, the state government and NABARD worked closely together to establish policies and procedures to link mature SHGs with commercial, regional rural and cooperative banks.

A watershed is not only a geographical area, but also a living space. It is basically the area of survival of the community living within it and drawing its sustenance from it. There is a direct symbiotic relationship between the robustness and vitality of the local ecosystem and the quality of life of the people living therein, especially in resource fragile regions. Development is possible when primary stakeholders or beneficiaries are actively involved in the project. Such an approach also increases the “staying capacity” of crops and livestock in times of drought and strengthens the capacity of the community to adapt to local climatic variations.

People’s participation and ownership of the project at all the stages comprised as planning, implementation, monitoring, evaluation and maintenance for the success of watershed development interventions.

Self help groups are the organizations of people who belong to similar socio- economic conditions and willing to find new options of improving their living standards. They have a common goal to build their lives, their families and their societies through collective action. SHG's have emerged as the most

powerful mechanism in microfinance services in India and function as a collective guarantee framework. They provide the members with free loans at small interest prices. All the participants save their money and they can seek loans in return.

Government of India select micro finance is powerful tool to reduce poverty and improve the women empowerment. Micro finance is a very small amount, but it helps the poor people meet their needs and to raise their income levels and improve their living standards. Social and economical backward women have formed in to a group on the bases of “self-help” members voluntarily coming together to save small amount regularly, establishing linkage with banks for the delivery of financial services their members, delivery of credit to the needy members.

In India poverty reduction idea was initiated in the 1970s as income generation, skill building and several credit schemes with more focus on family head (male). Such initiations didn't support the welfare and empowerment of women. So they promoted women-focused programs and SHGs was one of them (Ramulu, 2006). The introduction of SHG also created opportunities for rural poor self-employment. In addition to the economic improvement of their families, this scheme has helped women earn additional monthly incomes. SHGs are usually designed for the vulnerable, and women in particular. The women are economically and socially empowered after joining the self-help group. This independence allows for having control over their lives. Empowerment for the weak, the oppressed, and the poor pose major challenge for the political powers. Empowerment can therefore be seen as necessary for any community who wishes to fight patriarchal structures that have curtailed their life opportunities (Scheyvens, 2009). Social mobilization and collective organization are the two imperative ways for empowering women. The team interaction carried out as part of SHGs has driven the women towards a healthier, happier, more successful, and more purposeful existence. Uma Narang (2012) explains the need of SHG to empower women in India. Women's involvement in

groups in the context of SHG is known as the most effective approach to address women who are deprived and weaker.

Impact of Watershed Development Programmes on Population of Livestock, Milk Production

In this part, findings on impact of PMKSY-Watershed project watershed development programmes on livestock's population, milk production and income have been discussed. The data from the sample households in the district showed increase in animal population from before project to the end of project period due to the availability of water resources and fodder.

It is found from Table-1 that a substantial increase of buffaloes was noticed in all the watershed projects compared to cows from before implementation to after the project period. Realizing the productivity of milk in the study area the beneficiaries have slowly replaced cows with buffaloes and now the district is covered mostly with buffaloes.

Changes in Milk Production

Due to promotion of livestock activities the total milk production across projects which was at 3,009.1 thousand liters increased to 5,849 thousand liters registering a growth of 94.4%.

Impact of Watershed Development Programmes on Agriculture and Fodder

The findings reveal that PMKSY-Watershed project watershed development programme had positive impact on cropping intensity of different crops in Kadapa district due to increased availability of water resources as a result of which area under crops increased in same size of landholdings.

Various other benefits such as reduced migration, women empowerment, etc. are noticed in many regions. But the benefits are not maximized without proper social mechanisms. Women participation in

community institutions is still limited. Landless communities and weaker sections are still left out of the land focused programmes.

Employment opportunities for the community members are increased with better wage earnings in construction work during pre watershed and engagement in the agricultural field during post watershed programmes.

But no specific formal mechanisms are developed to enhance the opportunities. It is acknowledged that without the wise and rational use of soil and water resources, the development of the semi-arid tropics would not be possible. Therefore, there is a need to transfer and spread the technology which helps to sustain as well as increase agricultural production in dry-land areas. The watershed based technology reduces erosion, increases the water table and given stability to production.

The main objectives of the analysis is to estimate the impact of the watershed development project on productivity and cost of production of different crop and dairy enterprises, to assess the change in land use pattern in the project area and to evaluate the economic viability of the project. The land use-pattern revealed a decline in the area under wasteland and increase in the area under irrigated agriculture, fodder, forestry and horticulture.

Rainfed areas mainly rely on mean precipitation and soil organic matter, nutrient amount and moisture holding capacity. Ground water and surface water resources help to maintain soil moisture while crop rotation, mixing animal waste in crop systems improves soil productivity.

As productivity in agriculture and farm income increase, this would generate additional growth in the economy. Lower expenditure on organic fertilizers and constant water supply also helped to improve cultivable land. Support services such as agricultural machinery and irrigation techniques also improved crop production and participation of labor in the study area.

Economic Support through SHG

Bank Savings

The ability to save periodically and have access to their money is one of the primary benefits of investing in an SHG. SHG has a strong effect on members in saving their hard earned money. The impoverished can be driven out of poverty traps by education, developing skills and creating new economic opportunities. Women's SHGs have made great strides in circumventing patriarchal influence over financial and political decision-making.

Bank linkages

Linking the SHG with the bank is an essential prerequisite for promoting financial inclusion. Unless SHGs access repeat doses of bank credit, the members will not be able to meet their consumption and production credit requirements at affordable interest rates. Apart from providing access to credit, bank linkage enables SHGs to utilize other services such as remittances of mission and other government funds such as interest subvention and insurance services. Bank linkage also promotes the financial literacy of the members and contributes to prudent utilization of funds.

Regular Repayments

Overall, many families were able to address their basic needs better than before. The repayment of loans by women was often better than that of men, and that women were likely to spend the income earned, on their families, leading to improved health and nutrition of the poor population and for improving the quality of their lives.

The main objectives of the analysis are to estimate the impact of the watershed development project on dairy enterprises and fodder, to evaluate the economic viability of the project. The land use-pattern revealed a decline in the area under

wasteland and increase in the area under irrigated agriculture, fodder, forestry and horticulture.

The total area under green fodder was found to be marginally higher due to availability of more water resources. Highest percent of farmers use own farm produced dry fodder in watershed area. Area available per animal under green fodder has been higher in Kadapa district. The income from animal husbandry sector was highest in successful project villages. Livestock population shows a positive change in number before and after project implementation.

The implementation of watershed development project has resulted in area expansion, increase in net cultivated area, increase in livestock population, improvement in crop productivity and employment days. The share of dairy income is also more in the irrigated villages. The results also revealed that the project activities executed for improving the economic environment in the project area worked well.

The SHG program's social impact is improved participation in decision-making, awareness of various programs and organizations that helped them believe about the SHG concept and empower women to take part in meetings. The collective development has brought out the hidden talent and competence among the participants. Networking SHGs expanded women's social networks and social capital, promote co-operation and collaborative growth, and provide more incentives for women's empowerment, not only to encourage their self-advocacy support but also transparency.

Micro-credit worked effectively in poverty reduction, particularly when borrowers were women. SHG with women has shown a great shift from below poverty line to above poverty line. SHGs enable women to grow their savings and to access the credit which banks are increasingly willing to lend.

Table.1 Change in Number of Animals Before and After the Project in YSR Kadapa District

Sl. No.	Name of the Project	Name of the Micro-watershed (MWS)	Before the project (cows)	After the project (cows)	Difference	% of change	Before the project (Buffaloes)	After the project (Buffaloes)	Difference	% of change
1	Animela	Animela	0	20	20	100	103	110	7	6
		Indukur	3	10	7	70	102	120	18	15
		Lingala	3	10	7	70	20	50	30	60
		Payasampalli	0	20	20	100	11	70	59	84
		Talapanur	5	12	7	58	70	90	20	22
2	Chinnamandem	Bonamala	95	120	25	21	2	20	18	90
		Chinnamandem	175	250	75	30	48	50	2	4
		Devagudipalli	255	320	65	20	10	20	10	50
		Kesavapuram	349	460	111	24	17	50	33	66
		C.Polimerapalli	153	250	97	39	10	30	20	67
3	Chinna Orampadu	Chinna Orampadu	52	100	48	48	241	285	44	15
		Gadela	11	15	4	27	108	150	42	28
		G.V.Puram	8	30	22	73	12	20	8	40
		Karlakunta	21	25	4	16	89	150	61	41
		Obulavaripalle	5	50	45	90	71	400	329	82
4	Gandapuram	Godlaveedu	4	20	16	80	253	280	27	10
		Gollapalli	6	30	24	80	105	125	20	16
		Maligudipadu	0	20	20	100	165	185	20	11
		T.Soudaravaripalli	4	20	16	80	406	350	-56	-16
		Yerrampalli	8	20	12	60	30	50	20	40
5	Kuppam	Gangarapuvandlapalli	138	150	12	8	206	250	44	18
		Kuppam	267	280	13	5	687	710	23	3
		Mahadevapalle	0	0	0	0	57	70	13	19
		Nerusupalle	8	20	12	60	26	30	4	13
6	Rangasamudram	Siddavaram	0	20	20	100	58	70	12	17
		Tekurpeta	23	25	2	8	623	650	27	4
7	Velidandla	Karnapapayapalle	4	12	8	67	131	171	40	23
		Kommanuthala	297	482	185	38	316	679	363	53
		Lopatnuthala	125	148	23	16	92	215	123	57
		Velidandla	54	83	29	35	121	157	36	23
Total			2073	3022	949	31	4190	5607	1417	25

Table.2 Details of Cultivation of Perennial Fodder

Work ID	Completed	Expenditure	Survey No. / Farmer Name
116112304008020045	8/3/2015	4489	105 / R. Vishnuvardhana Reddy
116112304008020042	8/3/2015	4489	338 / Ravi Prasad Reddy
116112304008020046	8/3/2015	4489	105 / R. Gangamma
116112304008020079	1/5/2016	4080	333.334/1 / R.A.Gangi Reddy
116112304008020080	11/7/2015	3713	324 / D.V.Ramana
116112304008020081	9/2/2015	4009	369/1 / Varalaxmi

Fig.1 Milk Production Before and After Project Implementation

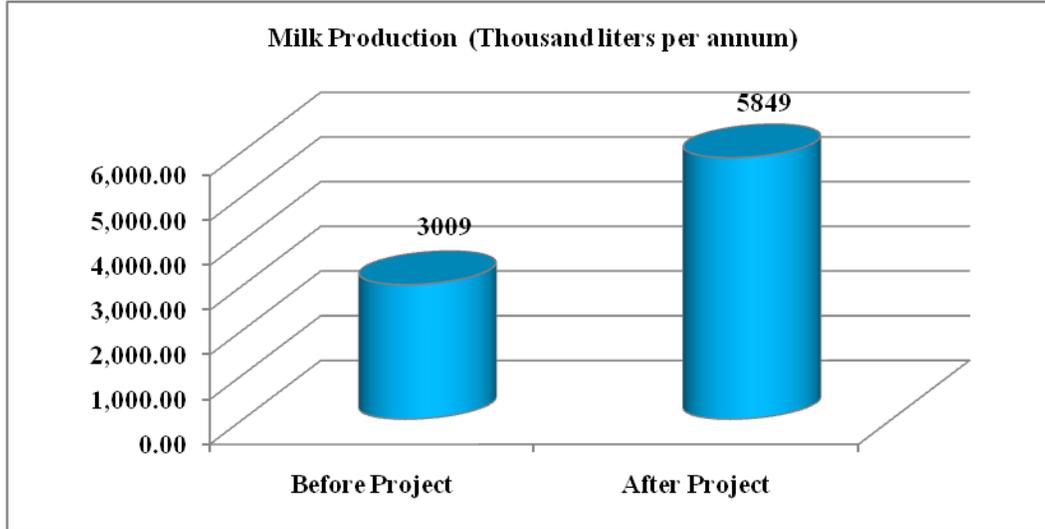


Fig.2 Fodder Cultivation



Case Study

The production of fodder aided the economic development of milk vendors in Payasampalle

Farmers in Payasampalle micro-watershed have benefited from the use of perennial fodder cultivation collectively through the Watershed Scheme. The farmer per family cultivates fodder from 0.10 acres to 0.50 acres. The farmers benefitted through the cultivation of fodder for 3 years.

The Watershed Scheme has been benefiting the farmers for 3 years and also for the cultivation of grass and so far 6 farmers have benefited. Another 11 farmers are ready to benefit. Funds were deposited regularly in the individual accounts of the

farmers every month. While there were only 173 buffaloes at the inception of the Payasampalle watershed program, the number has increased to 233 since the inception of the livestock development scheme. The entire village produces 460 liters of milk per day. Through this, farmers of 19 families are making a living by the livestock.

The watershed Scheme provided the opportunity to raise fodder, improve their living conditions and become financially viable under this scheme. The farmers are happy that the fodder scheme being implemented through the watershed scheme has greatly improved their living standards, creating an enable environment for them to increase their livestock, which will directly and indirectly meet their agricultural needs. One of the farmers stated

his case. He is Vishnuvardhan Reddy of Payasampalle village and he grown grass (fodder) in his 0.50 acres land under watershed program. This has enabled them to provide the green grass that the cattle need. This has led to an increase in milk yield in cattle. His living conditions have improved.

It is also reduced to depend on neighbouring villages for fodder. He is getting an amount of Rs. 3,000 by selling milk and he thanked the watershed initiation for fodder development. Totally 6 farmers benefited through the cultivation of perennial fodder under the watershed. The farmers detailed presented in below table.

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