GRAMA SEVA SANGAM

Since 1988

An Empowered Rural Community

EVALUATION REPORT ON IMPACT OF WATERSHED DEVELOPMENT PROJECT BY GRAMA SEVA SANGAM IN PUDUKKOTTAI DISTRICT OF TAMIL NADU, INDIA

EVALUATION AGENCY

CENTRE FOR RESEARCH IN ENVIRONMENT AND AGRICULTURE (CREA),

TRICHY - 620 009, TAMIL NADU, INDIA.

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PRELUDE

The Climate change is one of the foremost challenges of our time. Climate change is affecting farming by interfering with the efficiency of crop production. The Climate is the most important determinant of crop productivity, particularly in country like India, where about 2/3rd of the cultivated area is rainfed. In India, climate change is perceptible through a rise in all India mean temperature and increased frequency of extreme rainfall events in the last three decades. This causes fluctuation in production of major crops in different years.

Based on the vulnerability assessment of Indian Agriculture to climate change analysis by Indian Council of Agricultural Research (ICAR), 109 districts out of 573 rural districts (19% of total districts) are 'very high-risk' districts, while 201 districts are in risk zone category. For sustainable farming, conservation of resources and mitigation strategies is the need of the hour. For achieving this twin goals, Watershed Management Approach, is a right strategy for climate adaptation and mitigation.

A watershed is a geographical area that drains to a common point, which makes it an attractive unit for technical efforts to conserve soil and maximize the utilization of surface water and subsurface water for crop production. The Watershed activities include soil and moisture conservation measures in agricultural lands (contour/field bunding and summer ploughing), drainage line treatment measures (loose boulder check dam, minor check dam, major check dam, and retaining walls), water resources development management (percolation pond, farm pond, and drip and sprinkler irrigation), crop demonstration, horticulture plantation and afforestation as well community development activities.

In this context, Centre for Research in Environment and Agriculture CREA , Trichy involved in Social science research and environmental outreach activities explored the impact of watershed management activities by GRAMA SEVA SANGAM, Kilikkudi in Puthukottai district of Tamil Nadu. The study was conducted in four locations namely Amburpatti, Avvaiyarpatti, Alangudi and Kilikkudi villages of Pudukkottai district of Tamil Nadu state. The sample size was120 farmers @ 30watershed users from each of the watershed areas.

All the responses were documented by in depth interview and group discussions among the community. The vast majority of the respondents (65 %) felt that employment was generated by the watershed creation. The users also witnessed increase in ground water level and decrease in soil erosion adjoining the water bodies. The vast majority of the users (71 %) had favourableattitude towardswatershed activities. The majority of the respondents (74 %) perceived that there was decrease in crop failures whereas there was increase in crop yield and family income. The lack of credit linkage mechanism, lack of convergence among the rural development institutions and lack of feedback mechanism were the constraints felt by the users of watershed in the Puthukottai district.

Thus the impact assessment studies conducted by the team of experts from Centre for Research in Environment and Agriculture (CREA), across the watersheds over a period of time implies that watershed development activities by Grama Seva Sangham have generated highly significant and positive impacts in the line of Bio physical, Environmental and Socio-economical domains.

GENERAL DESCRIPTION OF PUDUKKOTTAI DISTRICT

Pudukkottai district as one of the princely states of Tamil Nadu, holds rich cultural heritage and was one of the homes of pre-historic man. The district lies between 78° 25' and 79° 15' east longitude and between 9° 50' and 10° 40' of the north latitude. The district has an area of 4,663 km² with a coastline of 42 km . Pudukkottai district is well endowed with natural resources of land and sea bounded by the marine hedge of Bay of Bengal in the east conjoined by the southern districts viz, Trichy, Sivaganga, Ramanathapuram and ThanjavurThe district is composed of three Revenue Divisions, namely, Pudukkottai ,Aranthangi and Illuppur and twelve Taluks, namely, Kulathur, Illuppur, Alangudi, Pudukkottai, Gandarvakottai, Thirumayam, Aranthangi, Avudaiyrakoil , Manamelkudi, Ponnamaravathi, Karambakkudi and Viralimalai.

DEMOGRAPHIC DETAILS OF THE DISTRICT

According to the 2011 census places total population of this districts 16,18,345 females being numerically superior with 8,15,157 as against 8,03,188 males. The rural population is about 13,01,991 and the urban population is about 3,16,354. The total literates number 11,10,545 with 6,08,776 males and 5,01,769 females. The Literacy rate is 77.19 percent with male literacy being 85.56 percent and femaleliteracy being 69.00 percent. The sex-ratio is 1015 females per thousand males.Scheduled Castes andScheduledTribesaccountfor 17.60 percent and 0.08 percentrespectively.

AGRO-CLIMATIC CONDITION OF THE DISTRICT

Climate

High temperature prevails throughout the year. Generally a dry and hot climate prevails in this District.

Rainfall

The actual annual rainfall was put at 716.3 mm during 2017-18 against the normal rainfall of 887.4 mm for the district. The annual precipitation is lesser than normal rainfall by 171.1 mm. About 407.3 mm is received in South West Monsoon, 207.5 mm, is received in North East Monsoon, 7.3mm rainfall is recorded for winter and 94.2 mm is received in Hot Weather Period.

River

In Pudukkottai District, four major rivers namely, Vellar, Agniyar, Pambar and Kundar are flowing. Besides the District has 17 small tributaries. It is to be noted that the four major rivers specified above, have the capacity to irrigate annually, an ayacut area of 51,448 hectares. The Cauvery-Mettur project (CMP) from Cauvery is flowing through Aranthangi, Karambakudi, Manamelkudi taluks of this district

Soil type

Black soil, Red loamy, Sandy coastal Alluvium, Red sandy soil are predominantly found in this district.

Temperature

The temperature ranges from a maximum of 40.10 to minimum of 18.60. Hot weather is experienced from April to June and November to January are the coldest months.

Cropping Pattern

Pudukkottai District is predominantely an agricultural district. Paddy, groundnut, sugarcane, maize and cashewnuts are the major crops grown in this district. Gross area sown and gross area irrigated under food and non-food crops stood at 1,08,497.970 Hectares and 92,461.185 Hectares respectively during 2019-20. About 15 percentage of the gross area sownwas rain fed.

Cropping Intensity

Net area sown decreased from 1,16,938 Hectares during 2018-19 to 91,014. 91Hectares during 2019-20 thus registering a decrease of 22 percent. Area sown more than once increased by 49.86 percent. Gross area sown decreased by 2 percent during this period.

Agricultural Holdings

According to 10th Agricultural census 2015-16 total number of farmers stood at 2,59,397 having total operational holding of 1,79,460 hectares. Farmers having size as low as 0.59 hectare, is uneconomical to cultivate. Out of 2,59,397 farmers, marginal farmers accrued for 81.21 percent, followed by small farmers 12.66 percent, small medium farmers 4.68 percent, medium farmers 1.26 percent and large farmers 0.2 percent.

Main Occupation

Majority of the people depend on Agriculture and allied activities. In the urban areas, the livelihood is earned through organized and unorganizedsectors. According to 2011 census, the district has a total of 3,87,679 households. There are a total of 7,61,693 workers comprising of 1,92,462cultivators, 2,34,344 agricultural labourers, 10,170 household industries, 2,03,272 other workers and 1, 21,445 marginal workers.

District Income

The Net District Domestic Product for Pudukkottai District for the year 2015-16 is estimated as Rs.15,13,080 lakhs at current prices and Rs.11,73,879 lakhs at constant (2011-12) prices.The percapita income is estimated as Rs.97189/- at current prices and Rs.70858/- at constant (2004-05) prices during 2014-15 in this district.

INTERVENTIONS IN PUDUKKOTTAI DISTRICT

The Watershed Development Program has been aimed at to ensure the availability of drinking water, fuelwood and fodder and raise income of, and employment opportunities for, farmers and landless laborers through improvement in agricultural production and productivity. The watershed development has become the main intervention for the natural resource management. Watershed development programs not only protect and conserve the environment but also contribute to livelihood security. In Pudukkottai District Integrated Watershed Management Programme are being implemented through District Watershed Development Agency in 97 Watersheds areas of 7 blocks like Gandaravakottai, Pudukkottai, Thiruvarankulam, Karambakudi, Arimalam, Annavasal and Kunnandarkovil.

In Puthukottai district, GRAMA SEVA SANGAM , as the Project Facilitating Agency(PFA), has undertaken and implemented Amburpatti, Avvayarpatti, Alangudi and KilikkudiWatershed Development Programme by involving the entire cross sections of the watershed communities viz, farmers, landless labourers

and women. The voluntary involvement of the communities in community development activities such as renovation of ponds, deepening of tanks and strengthening the bunds etc. were ensured for sustainability of the project.

SITUATION ANALYSIS

The situation analysis was done for identification of the prevailing problems. After the in-depth discussion with community by GSS members, it was identified that uncertain water availability is the prime issue. During the failure of the monsoon, the migration of the community to nearby town and cities was at higher trend. Even the farmers in the irrigated area were used to cultivate high yielding crop varieties with the intensive application of chemical fertilizers and pesticides, after which in some years the land becomes unsustainable for the crop plants, which affects the yield and productivity of the crop plants.

PLANNING

The project plan was prepared by GSS based on the rigorous discussion with the community and PRA exercises and the felts needs of the community was documented. The land development activities such as drainage treatment and as per the plan all the works – farm bunds, farm ponds, check dams and check weirs, agro-forestry and horticulture development works have been completed successfully by VWC and the watershed communities.The watershed development programs also aimed at enhancing the productivity and production of crops, changes in land use and cropping pattern, adoption of modern technologies and increase in milk production, etc.,

Group Discussion

PRA Exercise

ACTIVITIES

ENTRY POINT ACTIVITIES (EPA)

EPA activities were taken up under watershed projects to build a rapport with the village community at the beginning of the project. Generally, certain important works which are in urgent demand of the local community as well as which revive the common natural resources were taken up. A group Discussion was conducted with watershed Development Committee regarding the EPA activity before commencement. As entry point activities Borewell with Mini Power pump, OHT with pipeline connection, Thrashing floor, Retaining wall, Culvert and Bathing steps are implemented.

Retaining wall

Gully Plugs

INFORMATION, EDUCATION & COMMUNICATION (IEC) ACTIVITIES

For better understanding of the concept and ensuring active participation of the community, many Information, Education & Communication (IEC) activities were taken up in the project area such as Street plays ,Video shows, Puppet shows and Rallieswere conducted. The literatures on conservation of water resources such as leaflets, Pamphlets/ handouts were distributed and banners were installed at public places. Many capacity strengthening program were conducted for all the stakeholders of the project viz., Community, Project Implement Agency, Watershed Development Committee, Functional groups and Self Help Groups including exposure visit for Watershed President and Secretaries to model watershed of other districts are the other works being implemented.

Exposure Visit

LIVELIHOOD SUPPORT SERVICES

As Livelihood Support Services, distribution of Revolving fund for Self Help Groups in Watershed areas and provision of accessories for entrepreneurship were also done.

Strengthening SHG

WATERSHED PROJECT IMPLEMENTATION

Along with the land and water resources restoration, planting activities were also carried out for generating additional income.

Planting trees

RESEARCH METHODOLOGY

The study was an ex-post facto research study, which was carried out in four locations of Pudukkottai district. The respondents of the study were users of watershed areas.The user respondents were selected using stratified random sampling technique. The total number of respondents considered for the study was 120. A semi-structured and pre-tested interview schedule was used for data collection.The impact of the watersheds was assessed by examining the benefits that each watershed offered to the sample respondents, people participation in watershed programmes at different stages, budget utilization and target achieved. The data collected were analysed using appropriate statistical tools of percentage analysis, mean and standard deviation were used to categorize the respondents.

IMPACT EVALUATION

Impact evaluation assesses program effectiveness in achieving its ultimate goals.The main objective of this evaluation is to find the impacts of watershed implementation on certain key indicators on biophysical aspects, production related components and socio- economic issues.

BIOPHYSICAL IMPACT

The watershed activities involved the best natural resource management practices in the watershed area. The land and water resources development works such as farm pond, checkdam, new Village pond, supply channel, deepening of Kanmoi and Ooranies, sunken pond, cattle Pond, recharge Shaft, rejuvenation of Abandoned well, summer ploughing and compartmental bunding were implemented in watershed areas.

Table 1 : Grading of WS according to Quality of water harvesting structures (%)

Watershed Name	Grading of WS according to Quality of water harvesting structures (%)				Total n=120
	Poor	Satisfactory	Good	Very good	
Kilikkudi	0	25 (21)	76(63)	19(16)	120
Alangudi	4 (3)	24(20)	77(64)	15(13)	120
Amburpatti	4 (3)	31(26)	75 (63)	10(8)	120
Avvayarpatti	2 (2)	14 (12)	88(73)	16(13)	120

From table 1, it was evident that in vast majority of the respondents felt that the quality of water harvesting structures in all the four watershed areas were good and functional. For instance, out of 120 respondents 64 per cent and 73 per cent respondents from Alangudi and Avvayarpatti watersheds felt the water shed area works were good and functional respectively.

Before Watershed Programme **After Watershed Programme**

Disc Ploughing

Waste Wear **Checkdam**

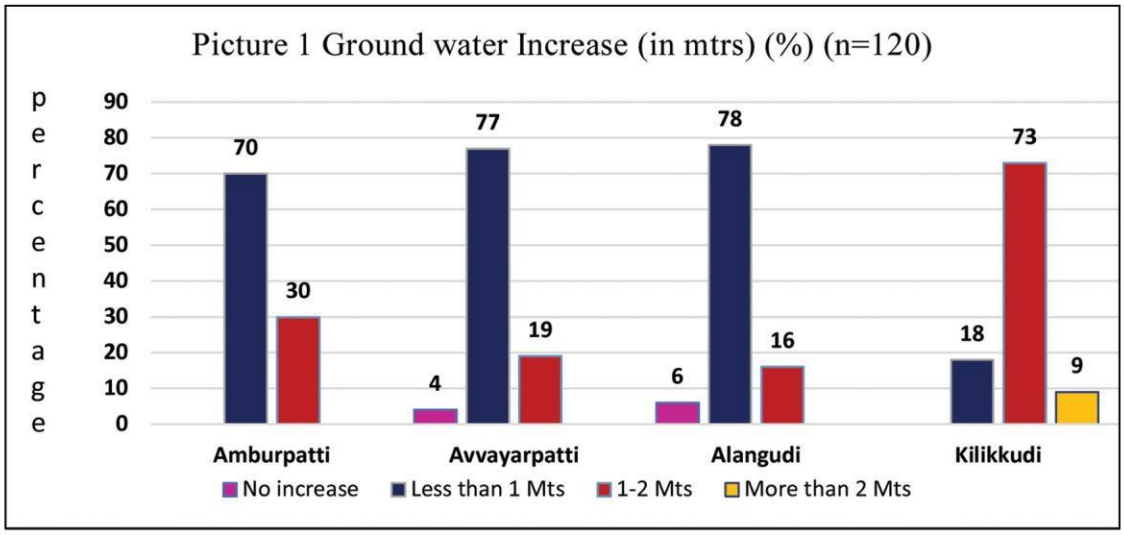
Field Bund

ENVIRONMENTAL IMPACT

The environmental indicators includes water level in the wells, changes in irrigated area, duration of water availability, water table of wells, surface water storage capacity, differences in number of wells, number of wells recharged/defunct and differences in irrigation intensity were documented. The rainwater harvesting structures constructed in the watershed help enhance the surface water storage capacity. Structures like minor and major check dams, percolation and farm ponds, and renovation of irrigation tanks help in a big way to enhance the surface water storage capacity. Evidence shows that, on average, nearly about 90 ha.cm increase in ground water level was created and varying from 64 ha. cm to 125 ha. Cm in all the 4 watersheds. In addition to the fixed capacity, repeated storage will be available for different fillings once already stored water is percolated. Impacts on the land and agriculture development activities have been significantly improved with preventing soil erosion through soil and water conservation measures implemented by VWC and farmers, there by increasing the groundwater level in the watershed villages.

Table 2 :Responses on Ground water Increase (in mtrs) in the watershed (n=120)

Name of the watershed	Ground water Increase (in mtrs) (%)				Total
	No increase	Less than 1 Mts	1-2 Mts	More than 2 Mts	
Kilikkudi	0 (0)	21 (18)	88 (73)	11 (9)	120
Alangudi	7 (6)	94 (78)	19 (16)	0 (0)	120
Amburpatti	0 (0)	84 (70)	36 (30)	0 (0)	120
Avvayarpatti	5 (4)	92 (77)	23 (19)	0 (0)	120



It is inferred from the table 2 Picture 1 that vast majority of 73 percent from Kilikkudi watershed area opined that there was increase of about 1-2 meter in the post monsoon period. The percolation and watershed structures recharged the ground water to the tune of 1-2 meters. As for as other watersheds, Amburpatty, Avvayarpatti and Alangudi watersheds were concerned, there increase a ground water level up to one meter after the completion of watershed works.

Farm Pond

FARM PRODUCTION SYSTEM

With the increase in ground water level, farmers own small open wells which now springs with water to sustain enough to promote horticultural crops like Mango, Sappota, Lemon, Guava either as with traditional irrigation methods or with the adaptation of drip irrigation for the horticulture by some farmers. The beneficiaries in Watershed Areas are provided with Agro forestry and Horticulture seedlings. In these horticulture plantations, intercropping with cereals and fodder crops are cultivated by the famers for the additional income to the farmers.

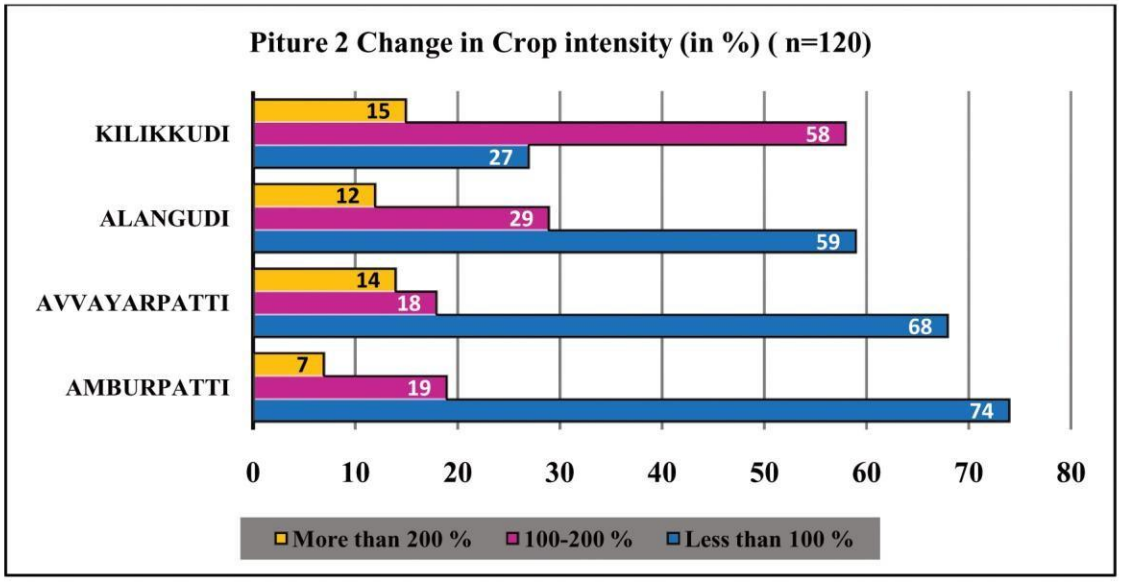
The Fodder development works, Distribution of Agriculture implements and equipments, Livestock Management works are implemented in watershed areas. The watershed development activities generate significant positive externalities which have a bearing on improving agricultural production and productivity.

With the results in increase in ground water access in open wells, now 68 hectares of lands are in cultivation under two or more crops a year. Ground water availability and assured water for irrigation are the reasons for the increased yield of crops cultivated. Inter cropping practices in the irrigated lands are common. The net sowing area observed were 65 hectares of cropping lands land prior to the implementation of the watershed development programmes. At the present situation, the net sowing area has increased to 93 hectares of cropping land with rain-fed crops like millets and cereals during the monsoon period.

The organic farming methods minimizes the external input cost and increased productivity of the crop plants. The organic agriculture farming capacity strengthening communities resulted in adoption of chemical free farming practices slowly but steadily. The study shows that the yield of crops cultivated in the lands has increased due to conservation of soil and moisture, increased soil fertility through organic farming practices and increased biomass of the land with recycling of farmyard as well as cattle wastes that naturally add fertility to the soil and thus increased productivity. The lands that were productive of 850 quintals of Cereals are now yields 980 quintals.

Table 3 : Change in Crop intensity (in %) (n = 120)

Name of the watershed	Change in Crop intensity (in %)			Total (%)
	Less than 100 %	100-200 %	More than 200 %	
Kilikkudi	32 (27)	70 (58)	18(15)	120
Alangudi	71 (59)	35 (29)	14 (12)	120
Amburpatti	89 (74)	23(19)	8 (7)	120
Avvayarpatti	82 (68)	21 (18)	17 (14)	120



The change in the crop intensity reveals the number of crops per year and additional income generated. About 68 per cent of the respondents from Avvayarpatti and 74 per cent of the respondents from Amburpatti inferred that there was change in the crop intensity to the tune of less than 100 per cent. In Kilikkudi watershed area, more than half of the respondents (58 %) felt that there was change in the crop intensity to the tune of 100 – 200 percentage. (Table 3, Picture 2).

Application of Vermicompost

Inter Cropping

Drip Irrigation

Sprinkler Irrigation

SOCIOECONOMIC IMPACTS

The watershed development programs are designed to influence the biophysical and environmental aspects thereby bringing changes in the socioeconomic conditions of the community. The multi headed interventions such as waste lands brought under cultivation, increasing cultivation area, productivity, diversified crop cultivation practices reflected in the socio-economic conditions of the watershed communities. The socio-economic indicators like changes in household income, per capita income and consumption expenditure, differences in employment, changes in lives of persons migrated, peoples' participation, household assets and wage rate at the village level were considered for the impact assessment. The farmers who migrated earlier without employment opportunities and abandoning agricultural practices, had returned to their village due to availability of water and guaranteed employment opportunities. The watershed intervention helped the rural farm and nonfarm households to enhance their income level. Evidence from Table 4 shows thatin Amburpatti watershed village, vast majority of 70 % earned additional employment to the tune of more than 40 days. In Avvayarpatti and Alangudiareas, respondents employed for more than 40 labour dayswere 61 % and 54 % respectively. The rural labor households in Amburpatti watershedderive Rs 25,340 when compared to Rs 19,850 in neighbouring villages, which is 21.66% higher. Similarly, the per capita income is also relatively higher among households of watershed treated villages. The proportions of difference among households across villages worked out to 23.17% in the Avvayarpatti watershed and 32.14% in the Kilikkudi watershed areas. In kilikkudi watershed area, majority of the respondents earned additional employment for more than 40 days in a year.

Table 4 : Additional employment as labour days/year (n=120)

Name of the watershed	Additional employment as labour days/year				Total
	Nil	Less than 20	20-40	More than 40	
Kilikkudi	5 (4)	8 (7)	30 (25)	77 (64)	120
Alangudi	15 (13)	16 (13)	24 (20)	65 (54)	120
Amburpatti	4 (3)	20 (17)	12 (10)	84 (70)	120
Avvayarpatti	10 (8)	18 (15)	19 (16)	73 (61)	120

Women prior to watershed development programmes, spent much of their time in fetching water from faraway places, collecting fire woods, fodder for the cattle. They struggled to meet out their personal and family needs. The watershed activities resulted in recharging of borewell and open wells. Now the women can access water at their door steps. They also get much leisure time and can spend their time in productive activities. The women members of rural society had developed their skills and earning capacity through SHG formation. The village level trainings have enabled the womenfolk to take up several initiatives for the development of their lives and thereby entrepreneurial activities. They initiated income generation activities such as pickle making, millets value addition by means of SHG formation. The groups sought financial assistance from nationalised banks. The savings and internal lending among the women have to a great extend reduced borrowing money from private money lenders.

Employment Creation

OVER ALL IMPACTS PERCEIVED FROM THE WATERSHED AREAS

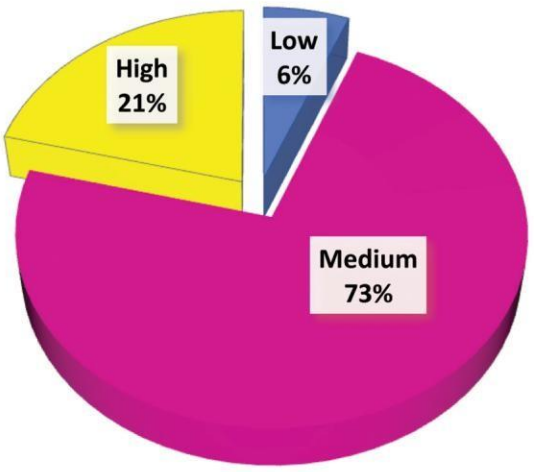
After the completion of the watershed projects, life standards of the people have been increased with the increased income from the land as well as from women developmental activities, tiled and concrete houses, two wheelers, and other household needs are fulfilled which reflects the changes in their life standards. The overall impacts of the WDP in terms of creating of local opportunities reduces moving of labour from villages as well as depleting of resources in urban areas.The overall impacts perceived after the completion of the Watershed projects at Amburpatti, Avvayarpatti, Alangudi and Kilikkudi ,were recharging of groundwater table, restoration of water bodies for human and animal consumption, sustainable cultivation and soil fertility resulting in bio diversity conservation and climate change mitigation.

Table 5 Over all impacts perceived from the Watershed Areas (n=120)

Sl.No	Overall impact category	No.	Per cent
1.	Low	7	6.00
2.	Medium	88	73.00
3.	High	25	21.00
	Total	120	100

It was concluded from the table 5 and Picture 3 that vast majority of 73 % respondents perceived that the over all impacts was at medium level where as very meagre (6 per cent) responded that there was low impact in the watershed areas. Almost 21 % of the respondents felt that there was high impact in the watershed areas.

Picture 3 Overall impact category (n=120)



KILIKKUDI

Form Bond - Fish Making

Exposure Visit

Seed Processing

Bio Gas Training

Rope Training

SHG Training

Vermi Compost

Veterinary Camp

ALANGUDI

Seed Processing Unit

SHG Training

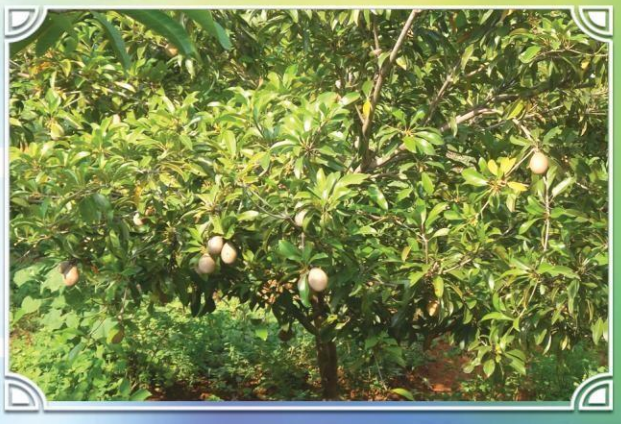
Field Visit

Field Fund

Construction of Sulice Visit

Farmer Training - Trupa Thirupathur

Coir Making



Plantation

AMBURPATTI

Cow Loan

JDA Visit

SRI Result

Saradha Plantation

AGM Programme

Exposure Visit

AGM - DGM Field Visit

AVVAIYARPATTI

Farm Bond

Plantation

SHG Training

Field Fund

Annapannai Training

Farmers Training

DGM Visit

KVK Vamban Meeting

FINANCIAL OUTLAY FOR WATERSHED PROJECTS

Financial discipline is all about getting one's numbers right and it requires setting clear goals, periodic measurement of performance, analysis of variances and taking corrective actions, and ultimately avoid future problems and prevent risks. Thus Grama Seva Sangam Puthukottai obtained funding from NABARD and DWDA District Watershed Development Agency,Tamil Nadu and completed the watershed projects in a most successful way without any ratification and modification in the projects. The fund allocation from NABARD and DWDA are as follows,

S. NO	WATERSHED VILLAGE	COVERED VILLAGE	ha	POPULATION	SANCTION AMOUNT	FAMILIES
1	Kilikkudi	12	1352.5	2706	7453340	774
2	Alangudi	7	882.975	1350	6529480	600
3	Amburpatti	12	1432.37	3155	15060500	675
4	Avvaiyarpatti	5	1080	3451	8331770	703
5	Amburpatti Climate Proofing Project	12	1432.37	3155	5876700	675
6	Avvaiyarpatti Climate Proofing Project	5	1080	3451	5831870	703
Total		**53**	**7260.22**	**17268**	**49083660**	**4130**

CONSTRAINTS AS PERCEIVED BY THE COMMUNITY

The study shown that the watershed development programme have produced desired results at the same time there are differences in their impacts. Though positive changes were perceived by the users, the community participation in watershed activities was poor except in case of wage earners/subsidy beneficiaries. The lack of credit linkage mechanism, lack of convergence among the rural development institutions and lack of feedback mechanism were the constraints felt by the users of watershed in the Puthukottai district.

CONCLUSION AND SUGGESTIONS

Watershed development programmes serves as life line intervention of the natural resource management and rural development. The watershed not only protects and conserve the environment, but also contribute to livelihood security.

Hence, the watershed impact assessment should be accorded due importance in the future planning and development programmes. At the same time, being with large investment of financial resources in the watershed programme, it is important that the watershed development programme should meet the intended objectives and desired impacts. The impact assessment studies conducted by the team of experts from CREA, Trichy across the watersheds over a period of time imply that watershed development activities by Grama Seva Sangham have generated significant positive impacts in the line of Bio physical, Environmental and Socio-economical domains.

For a sustainable benefit of the watershed development programme, some of the suggestions derived are presented as follows,

(i) ***Engagement of sectoral expert from Agricultural domain:*** For regular and routine monitoring of environmental parameters, engagement of sectoral expert from Agricultural domain on full time basis was felt for the overall rural and agricultural development after the completion of the project for a minimum period of 2 years.

(ii) ***Rural development programme integration:*** The conjunction of various rural development programs in and around the watershed could be ensured to promote the holistic development of watersheds.

(iii) ***Credit linkage mechanism :*** The financial institutions support and credit linkage could be leveraged for watershed area on priority basis.

(iv) ***Stakeholders' convergence:*** The convergence and involvement of Panchayati Raj Institutions, local user groups and NGOs alongside institutional support from different levels, viz. the Union Government, the state, the district and block levels should be ensured to make the programme more participatory, interactive and cost-effective. The convergence could be accelerated by organising periodical meetings along with community. For effective project execution, the stakeholders should also be provided with trainings on different aspects of project management, resource administration, institution strengthening etc.

(v) ***Social media for Mechanism for community feedback:*** The feedback and grievance addressal mechanism could be designed so that interim project evaluation could be achieved. For getting feedback, social media tools could be effectively utilized by launching community run WhatsApp, Facebook groups. The follow up of watershed activities could also be easy and timely by using social media.

The watershed development works carried out by Grama Seva Sangham under the leadership of Chairman Shri Palanichamy have accomplished its classical functions in relation to soil and water conservation by decreasing erosion and increasing ground water level. At the same time, livelihood enhancement, production diversification and conservation of assets are the vital elements in successful watersheds. In the present study, there is a significant difference in people's participation with respect to different stages of project execution in different watersheds and also within each watershed. Therefore, community participation is much needed even after the completion of the projects. Along with the Peoples' participation, involvement of Panchayati Raj Institutions, local user groups and NGOs along side institutional support from different levels, viz. the Union Government, the state, the district and block levels should be ensured to make the programme more participatory, interactive and cost-effective. If some of these crucial issues are taken care, the watershed development would become a sustainable livelihood programme.

The livelihood of people dwelling in fragile ecosystem, the Project Implementing Agencies (PIAs) role is very much crucial for the effective execution and functioning of the watershed interventions. Our data revealed that the watershed projects carried out by Grama Seva Sangham, Puthukottai were executed in appreciable manner. It is worth to mention that the watershed works at were environmentally and financially viable and would serve for the betterment of the watershed communities in the long run.

Evaluation Report compiled by

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