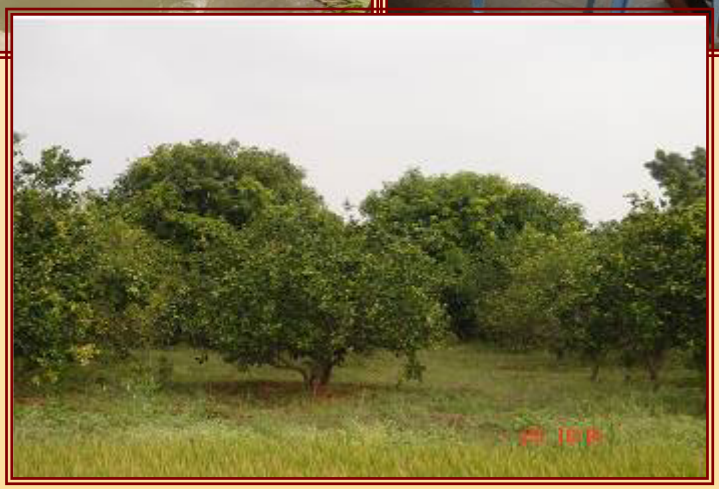
Impact Assessment Report

Drought Prone Area Project

(DPAP-BATCH I)

Nalgonda District, Andhra Pradesh



ICRISAT
Science with a human face

International Crops Research Institute
for the Semi-Arid Tropics

November 2010

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By

Global Theme on Agroecosystems

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International Crops Research Institute
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Patancheru 502 324, Andhra Pradesh, India

November 2010

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MULTI-DISCIPLINARY IMPACT ASSESSMENT TEAM

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We greatly acknowledge to the Commissioner, Department of Rural Development, the Government of Andhra Pradesh for providing co-ordination with Project Director, District Water Management Agency (DWMA), Nalgonda; to guide us in selecting watersheds for complete representation of variability of watersheds for the impact assessment study of DPAP Batch I watersheds in Nalgonda.

We are thankful for the support and guidance of Mr. Srinivas Babu, Project Director, DWMA and Mr. Janardhan Reddy, Additional Project Director, DWMA for providing all support from their project staff besides their active participation. We record our profound thanks to all Assistant Project Director (APD's) of all mandals s for their untiring support and help touring along with us every day and organizing *gram sabhas* and field visits in all watersheds, which was most crucial in our efforts.

Our team acknowledges the useful information shared by President, Chairmen, Secretaries, members SHG's women group members of DPAP project beneficiaries during focused group discussions (FGD) and field visits.

We profusely thank Dr. William D. Dar, Director General of ICRISAT for his approval to undertake this study and encouragement for a good analysis of the study.

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ABBREVIATIONS

APD:	Assistant Project Director
CJFS:	Co-operative Joint Farming Societies
DRDA:	District Rural Development Agency
DPAP:	Drought Prone Area Programme
DWMA:	District Water Management Agency
EAS:	Employment Assurance Scheme
DLR:	Department of Land Resources
DCBC:	District Capacity Building Center
FGD:	Focused Group Discussions
MDT:	Mandal Development Team
NGO:	Non-governmental Organization
PD:	Project Director
PIA:	Project Implementing Agency
PRA:	Participatory Rural Appraisal
CPR's	Common Property Resources
PT:	Percolation Tank
MIT's	Minor Irrigation Tanks
RFDs:	Rock Filled Dams
SF:	Social Forestry
SPW:	Silt Protection Wall
SHGs:	Self Help Groups
SMC:	Soil moisture conservation
UGs:	User Groups
WA:	Watershed Association
WS:	Watershed
WC:	Watershed Committee
WDF:	Watershed Development Fund
WDT:	Watershed Development Team

EXECUTIVE SUMMARY OF IMPACT ASSESSMENT

1. In Nalgonda district, there was shortage of drinking water for human and cattle's during summer months. Due to different watershed structure's constructed across the watersheds there was an improvement in water level in open wells and new bore wells have come up in the watershed area have improved the water level. On an average in the range of 0.6 to 2.5 m ground water level increased in wells and bore wells. There is no problem of drinking water now through out the year as mentioned by farmers during meetings.
2. Area under irrigation for double growing increased 25-30% due to increased water availability in open wells and new bore wells dugged due to various interventions through CD's, PT's structure's across the watershed for irrigation to paddy, sugarcane crop and horticulture plantations specially check dams and percolations tanks controlling free flowing runoff water.
3. Water flows as seepage slowly from hilly to plain cultivable areas in the watershed due to CCT's. Ground water level in many farm ponds and PT's. Diversion drains from hillocks helped in checking hillock runoff and diverting to percolation tank or MI tanks. Minor irrigation channel approaches were cleaned to improve inflow to tanks for higher water storage.
4. Due to improved water availability double cropping with one or two supplemental irrigations for second crop between Decembers to February is done to grow many crops like pigeon pea and, cotton. Most of the area where paddy is grown for 2 seasons with support of wells and bore wells. Farmers felt this impact and area increased for irrigation and this is very good benefit for them.
5. The area is bunded for soil moisture conservation and 20% of the budget was spent on this activity. The time when this work was done 10-12 years ago have benefited lot and improved crop yields from 50-100%. The bunds are maintained by indusial farmer are still getting the benefit.

6. Appropriate and more trainings on productivity enhancement technology to WC members and farmers, and establishment of linkages to technology centers through farmers' visits in this project would have benefitted farmers and rural poor and created more impact on their incomes, as there were no new cropping technologies or new livelihood activities significantly adopted by farmers and rural poor. Over all training component target was not achieved.
7. The plantation of common property lands 590ha with Pongamiya, Teak, Sisu, Rita, Bamboo, and Subabul and on road side plantations were not survived due to moisture stress and only 26% plants survival is seen.
8. Horticulture plantation of citrus crop in 300ha helped farmer in getting higher economic benefit with improved income from 100-300%. The water support from wells and bore wells helped a lot for proper establishment of crop and getting good yield of crop. Many farmers adopted drip irrigation for cultivation. The area is expanded under fruit crop with drip irrigation facility.
9. The women utilized the revolving fund effectively and also grown themselves from initial no to many new groups as active micro finance groups .SHG's utilized the revolving funds in various micro enterprise activities like purchasing the milch animals, tailoring shop, Kirana shops and also supporting to buy a agricultural inputs through h bank linkages helped to improve economically.
10. The women farmers with support of revolving fund and bank loans purchased buffalo and improved milk production and their income improved 100% due to milk collection center supported them with proper price and timely payment.
11. Variability exists in reported increase in crop productivity across watersheds from as low as 20% to more than 40% in main crop season as well as second crop season in some watersheds. Farmers grown paddy, cotton and sugarcane and horticulture crops.

12. Employment increased and migration reduced completely up to 70-80% due to various activities in the village like double cropping in agriculture, dairy and horticulture works.
13. The drought proofing to the extent of one crop season was established due to additional water availability and also through dairy and horticulture activity. Supported by micro finance and bank linkages farmers can survive a crop season.
14. WDF funds collected were in the order of Rs.28.91 lakhs plus interest on principle in 49 watersheds under DPAP-I. If these funds were made available for repair and maintenance of soil and water conservation structures their impact would have been felt better by the beneficiaries in the watershed.
15. The immediate requirement of repair of structure (CD's and PT's) will help in functioning effectively to help recharge ground water. The LBS, RFD's were needed to be repaired and further spending money on this type of structure can be reduced in future projects.
16. The most of the check dams (>50%) and percolation tanks are silted up the flow of water is also some time diverted. The period is very long as 10-12 years lapsed after the construction and all these years lot of accumulation of silt in these old structure's need to be repaired and desilted for proper functioning for effective ground water recharge. This is very essential and to be taken up immediately.
17. Our analysis of Focused group discussions with village communities indicate that only 70% of the watershed villages sounded that they are not vulnerable to one year of drought as they expressed confidence of growing one crop, as well dairy activity and also horticulture plantation as their SHG's linkage for credit with banks can help tide over the financial and food insecurity due to crop failures.

BACKGROUND

Department of land resources(DLR) under the Ministry of Rural Development(MoRD), Government of India, sanctioned the Drought Prone Area Project (DPAP) - Phase I for Nalgonda district of Andhra Pradesh. The project encompassed treatment of 22,355 ha area in 49 watersheds of 21 mandals of Nalgonda district. The objectives of this project were 1. Integrated land and water management of cultivable, un- cultivable and common land with suitable treatment for soil, water conservation and water harvesting activities into the village micro-watershed plans (Approx-500ha).

2. Integrating forestry, horticulture and Animal husbandry components for enhancing the income of community. 3. To enhance people's participation in the Drought Prone Area Program at all stages.4. To encourage participation of women in micro finance and micro enterprise activity. This project was sanctioned for implementation with a project budget outlay of Rs. 980 lakhs (Table 1), and to accomplish over a period of 4 years from 1995-96 to 1998-1999.

Table 1. Component-wise approved targets and financial allocation in the project.

Details of activities	**Total target/allocation**	
	Financial (Rs. lakhs)	**% of Total cost**
Community organizations	49	5
Training	49	5
Works	784	80
Administrative costs	98	10
Total	**980**	**100**

Drought Prone Area Program (DPAP) Nalgonda, now designated as District Water Management Agency (DWMA) was assigned the responsibility of providing infrastructure for implementation, management of the project through project implementing agency and financial supervision of the project. DPAP Nalgonda selected the various NGO's and Government departments for undertaking project implementation during 1995-96 to 1999-2000. The list of 49 selected watersheds in respective mandals and **PIA** for undertaking project activity was given in table 2 below. The project implementation started in the year 1995-96 and works were

implemented in 49 watersheds as per approval. However project was implemented in 49 watersheds each of 500ha in villages (fig 1) as a cluster selected based on 1. Acute shortage of drinking water 2. Forming part of the area of watershed draining to a river/stream/local tank. The project execution over run due to delay executing works and non-compliance of guidelines in the stipulated period of four years and was extended up to 31-12-2000 which was completed in 6 years.

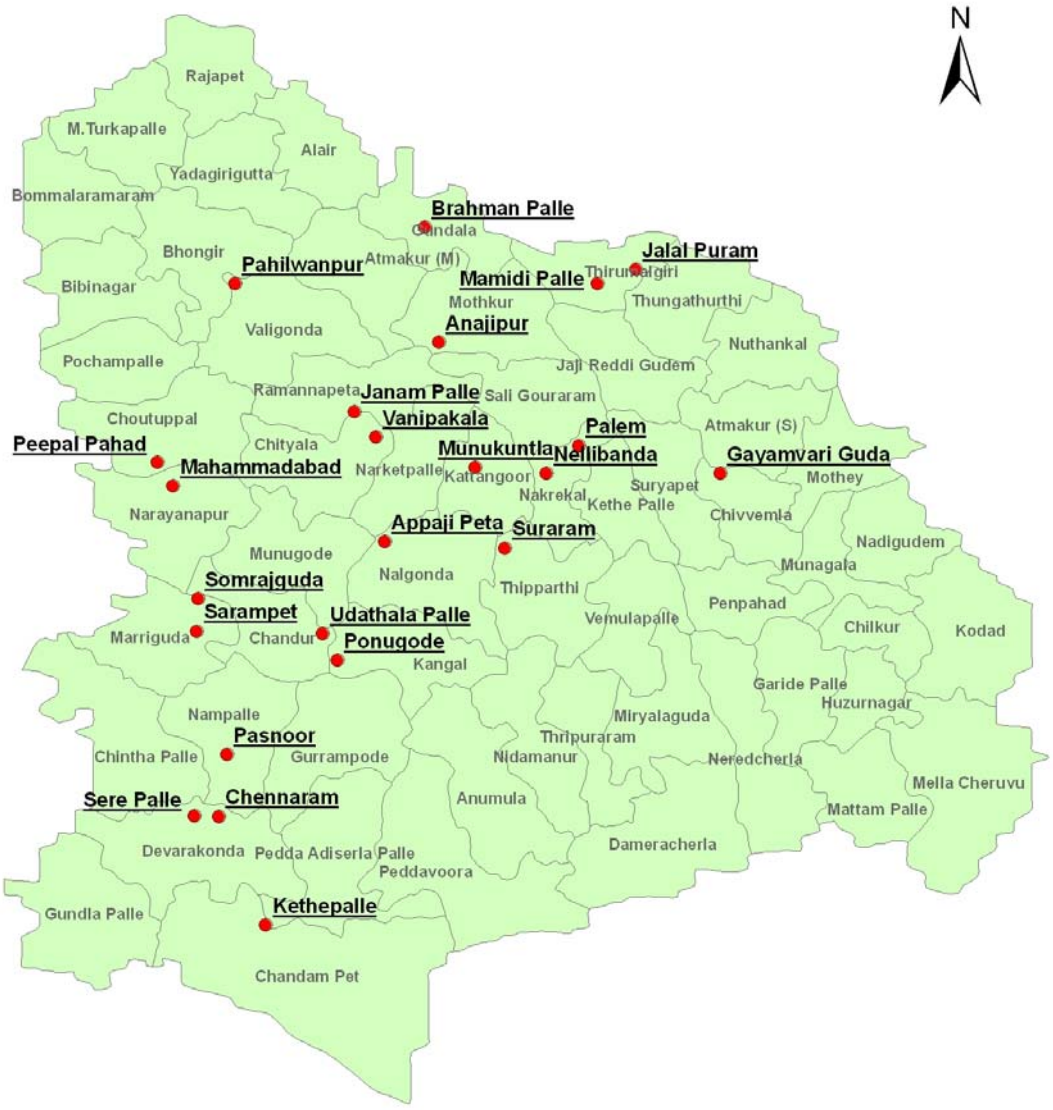


Figure 1. Location of villages where watersheds activities were taken up under DPAP-I project in Nalgonda district during 1995-2000

Table 2. Details of 49 watershed covered by DPAP-I project and Name of PIA in these watersheds.

S No.	Name of the watershed	Villages in watershed	Mandal	Name of PIA
1	Varuna	Vonipakala	Chityala	SISS,Munugode
2	Gummala	Vonipakala	Chityala	SISS,Munugode
3	Reddymallaihkunta	Peepal Pahad	Choutuppal	MPDO,Choutuppal
4	Dabbikunta	Munukuntla	Kattangur	Birds&Pilupu, Kattangur
5	Komitikunta	Munukuntla	Kattangur	Birds&Pilupu, Kattangur
6	Akkalaigudam	Munukuntla	Kattangur	Birds&Pilupu, Kattangur
7	Boinkunta	Appajipet	Nalgonda	ADA (SC), Nalgonda
8	Chitalkunta	Appajipet	Nalgonda	ADA (SC), Nalgonda
9	Kakicheravu	Appajipet	Nalgonda	ADA (SC), Nalgonda
10	Gurrappacheravu	Appajipet	Nalgonda	ADA (SC) ,Nalgonda
11	Peddasuraram-I	Peddasuraram	Thipparthy	MPDO, Thipparthy
12	Peddasuraram-II	Peddasuraram	Thipparthy	MPDO, Thipparthy
13	Chinnasuraram	Chinnasuraram	Thipparthy	MPDO,Thipparthy
14	Kamadenu	Kethepally	Chandampet	ADA (SC), Deverakonda
15	Kalpavruksham	Kethepally	Chandampet	ADA (SC), Deverakonda
16	Udhalapally	Udhalapally	Chandur	Sathantha Haritha, Chandur
17	Sherepally	Sherepally	Deverakonda	DASM, K Mallepally
18	Peddathanda	Peddathanda	Deverakonda	DASM, K Mallepally
19	Chennaram	Chennaram	Deverakonda	DASM, K Mallepally
20	Ambothuthanda	Chennaram	Deverakonda	DASM, K Mallepally
21	Ganyanaikathanda	Chennaram	Deverakonda	DASM, K Mallepally
22	Laxmamma	Sarampet	Marriguda	DFO(TR) Nalgonda
23	Muthyalamma	Sarampet	Marriguda	DFO(TR) Nalgonda
24	Gangamma	Somarajguda	Marriguda	DFO(TR) Nalgonda
25	Ailamma	Somarajguda	Marriguda	DFO(TR) Nalgonda

26	Srujana	Pasnoor	Nampally	GRDS, K.M.Pally
27	Pragathi	Pasnoor	Nampally	GRDS, K.M.Pally
28	Spandana	Pasnoor	Nampally	GRDS, K.M.Pally
29	Jagruthi	Pasnoor	Nampally	GRDS, K.M.Pally
30	Teja	Pasnoor	Nampally	GRDS, K.M.Pally
31	Palem-1	Palem	Nakrekal	PROGRESS, Nakrekal
32	Palem-2	Palem	Nakrekal	PROGRESS, Nakrekal
33	Neelibanda	Neelibanda	Nakrekal	PROGRESS, Nakrekal
34	Adivemla-1	Neelibanda	Arvapally	DFO(SF), Nalgonda
35	Adivemla-2	Neelibanda	Arvapally	DFO(SF), Nalgonda
36	Gayamvarigundem	Gayamvarigundem	Chivvemla	DFO(SF), Nalgonda
37	Balaji	Mamidipally	Thirumalgiri	SHARP,SPRING
38	Someshwara	Jalapur	Thirumalgiri	SHARP,SPRING
39	Kisan	Jalapur	Thirumalgiri	SHARP,SPRING
40	Vankarai	Mahamadabad	Narayanpur	PEACE
41	Venkambai Thanda	Mahamadabad	Narayanpur	PEACE
42	Mahamadabad	Mahamadabad	Narayanpur	PEACE
43	Kakicheravu	Ponugodu	Kanagal	ADA(SC), Nalgonda
44	Anantha	Anjapur	Mothkur	SEERD
45	Bramha	Pahilvanpur	Valigonda	NEED
46	Pahilvanpur	Pahilvanpur	Valigonda	NEED
47	Janampally	Janampally	Ramannapet	NEED
48	Devunigutta	Bramhanpally	Gundala	APD(E) MDT IV
49	Bangarumaisamma	Bramhanpally	Gundala	APD(E) MDT IV

Geography of Nalgonda district

Nalgonda is located in Andhra Pradesh state and its global location is between 16-25' and 17-50' of the Northern Latitude and 78-40' and 80-05' of Eastern longitude. N algonda has an average elevation of 421 meters (1381 ft. The District is bordered by Medak and Warangal districts in the North, Guntur and Mahabubnagar districts in the South, Khammam and Krishna districts in the East while the districts of Mahabubnagar and Rangareddy lie in the West. The total population of Nalgonda is

34.5 lakhs and the density of population is 227 per Sq. Km (2001 census). Males constitute 51% of the population and females 49%. Nalgonda has an average literacy rate of 78%, higher than the national average of 59.5%: male literacy is 84%, and female literacy is 72%.The Geographical area of the district is 14,217 Sq. Km accounting to 5.18% of the total area of the state of A.P.

Soils and Land use pattern

Much of the soil is of red yellow type. Many areas have deep red soil (locally referred to as "erra mannu") comprising loamy sands, sandy loams and sandy clay loams derived from the decomposition of the granite base rock. In the areas of flat topography and alongside of riverside tracts and its tributaries have alluvial soil where paddy is grown and also black cotton soil is found. Due to the semiarid climate, poor soil and lack of adequate irrigation, dry land farming is widely prevalent. Out of a total of 14, 23,423 hectares of land utilization in the district, more than 50% is cultivable land. The main crops grown in the district are Paddy, Jowar, Bajra, Ground Nut, Red gram, Green gram, Castor and sugarcane. . Horticulture is also practiced; there are a number of citrus and mango plantations.

Climate and Rainfall

The average rainfall in the district is 731 mm. 81% of the annual rainfall is received by the district during south west monsoon (i.e. June to September). September is the rainiest month. The variation in the annual rainfall in the district from year to year is large. The region experiences a hot and dry summer throughout the year except during the South West Monsoon season. The year may broadly be divided into four seasons. It experiences cold season from December to Mid February, summer season from Mid February to first week of June. South West monsoon season from June to September and retreating monsoon or the past monsoon season during October to November. Cold season, extending from December to February, is followed by summer when both day and night temperatures increase sharply. May being the hottest month, the summer temperatures, during the months of March to May, are quite high with the temperature often crossing 40 degrees Celsius. The relative humidity during these months is also quite low although the dry monotony is broken occasionally by thunderstorms on the evenings of hot days. Lighting strikes and hails storms during these thunderstorms sometimes kill farmers and cause damage to crops, especially mangoes. Much of the rainfall though is concentrated in

the summer months of June to August, transforming the brown and bleak landscape into lush green. Winters are pleasant with mild temperatures, crisp sunshine, clear blue skies and cool breeze.

Table 3. Annual rainfall (mm) during 1995 to 2000 in 18 Mandals of Nalgonda district

Year wise rainfall (mm) of Nalgonda District

Mandal's	1995	1996	1997	1998	1999	2000
Arvapally	1004	938	811	597	150	659
Chandur	881	1012	642	730	600	653
Chityal				939	392	646
Chivemela	961	769	648	807	447	526
Choutuppal	885	851	716	692	373	442
Deverakonda	829	722	442	864	554	617
Gundala		758	624	492	415	648
Kattangur		857	678	847	378	378
Marriguda	1016	508	299	748	286	404
Mothkur	1020	732	517	782	546	717
Nakrekal	1012	1027	762	1001	683	672
Nalgonda	1078	570	559	1393	222	616
Nampally	951	573	417	737	414	431
Naraynapur	467		738	652	213	345
Ramannapet	774	993	712	721	332	676
Thipparthy			556	652	452	420
Tirumalgiri			845	958	672	684
Valigonda	808	782	623	787	329	839

Yearly rainfall in the district from the year 1995 until 2000 during the watershed implementation period is presented in table 3. Rainfall has been normal in all the mandals of the district except few mandals for the year 1995, 1996 and 1997 and rainfall in 1999 and 2000 season was deficient in all mandals. Hence many farmers in the focused group discussions mentioned about good rainfall made use of effectively in the initial years of project that lead to good impact due to check dams, percolation tanks, LBS, GC's, RFD's, CCT's, Diversion drains and field bunding works in watershed interventions/development in terms of improved ground water availability in open wells and bore-wells for crop production.

METHOD OF IMPACT ASSESSMENT

Multi-disciplinary impact assessment team

Dr. S. P. Wani, Principal Scientist (watersheds), Regional Theme Co-ordinator (Asia), Global Theme- Agroecosystems

Mr. L. S. Jangawad, Sr. Scientific officer, Agricultural Engineering

Mr. Ch. Srinivasa Rao, Sr. Scientific officer, Soil Science

Mr. V. Nageswarar Rao, Lead Scientific officer, Agronomy

ICRISAT's Global Theme on Agrocecosystems, which was responsible for the impact evaluation of the DPAP watershed projects in Nalgonda, consists of scientists from various professional backgrounds: soil science, hydrology and agricultural engineering, and agronomy. To undertake the impact assessment of watershed projects, multi-disciplinary team was formed that consisted of (at least) three researchers with different areas of expertise and (at least) one scientific officer who was responsible for the technical inspection and evaluation of the constructed structures in the watershed. To assess the different aspects of watershed development projects, the scientists in each team had scientific expertise in Agronomy and soil science/hydrology, engineering/technical aspects and social aspects/institutions.

As a first step, ICRISAT's Global Theme Agrocecosystems discussed the "terms of references" from the Government of India and shared the experiences from previous impact and midterm assessments. The division of tasks was undertaken in a participatory manner depending on the professional expertise and the local knowledge of the scientists and scientific officers. We had divided tasks of the impact assessment in two parts. 1. Focused Group discussions, with participation of the local population, a crucial factor of a successful impact assessment. 2. Field visits, to ensure verification of watershed structures, their maintenance and assess their use.

DISCUSSIONS WITH DWMA OFFICIALS

ICRISAT undertook the assessment with an open and participatory approach with the staff of the DWMA and village level staff. The involvement of the program staff of the respective watershed projects at various stages of the assessment aimed at enhancing the ownership of the results among the extension personnel. Impact assessments in Nalgonda started with a meeting of the ICRISAT team with Additional

Table 4. List of selected DPAP I watersheds, and concerned PIA's for impact Assessment

S. No	Name of the watershed	Village	Mandal	Name of the PIA
1	Ailamma	Somarajguda	Marriguda	DFO(TR) Nalgonda
2	Anantha	Anjapur	Mothkur	SEERD
3	Boinkunta	Appajipet	Nalgonda	ADA (SC), Nalgonda
4	Chinnasuraram	Chinnasuraram	Thipparthy	MPDO,Thipparthy
5	Dabbikunta	Munukuntla	Kattangur	Birds&Pilupu, Kattangur
6	Devunigutta	Bramhanpally	Gundala	APD(E) MDT IV
7	Ganyanaikathanda	Chennaram	Deverakonda	DASM, K Mallepally
8	Gayamvarigundem	Gayamvarigundem	Chivvemla	DFO(SF), Nalgonda
9	Janampally	Janampally	Ramannapet	NEED
10	Kalpavruksham	Kethepally	Chandampet	ADA (SC), Deverakonda
11	Laxmamma	Sarampet	Marriguda	DFO(TR) Nalgonda
12	Nellibanda	Neelibanda	Nakrekal	PROGRESS,Nakrekal
13	Pahilvanpur	Pahilvanpur	Valigonda	NEED
14	Palem-1	Palem	Nakrekal	PROGRESS,Nakrekal
15	Peddathanda	Peddathanda	Deverakonda	DASM, K Mallepally
16	Peddasuraram-I	Peddasuraram	Thipparthy	MPDO, Thipparthy
17	Pragathi	Pasnoor	Nampally	GRDS, K.M.Pally
18	Sherepally	Sherepally	Deverakonda	DASM, K Mallepally
19	Varuna	Vonipakala	Chityala	SISS, Munugode
20	Vankarai	Mahamadabad	Narayanpur	PEACE

Project Director and all of the Assistant Project Directors (APD) of DWMA and their staff under the instruction of Project Director of the District Water Management Agency, Nalgonda. Meeting with project staff helped us to finalize the list of watershed villages (Table 4.) evenly spread across 16 mandals in Nalgonda district (Fig 1) for impact assessment and scheduled our visit. We also ensured accompanying and participation of concerned APDs at FGD in watersheds in their respective mandals, and their presence was quite helpful in mobilizing farmers, committee members and field visits to watershed structures.

FOCUSSED GROUP DISCUSSIONS

The focus-group-discussions were held with members of the watershed development team, the watershed committee, farmers/beneficiaries and whenever possible with the Gram Panchyat president even. Focus-group-discussions enabled us to elicit valuable information in short time and to include the community in the process. It is important to check, however, the participation of a representative sample of the local population in order to extract meaningful information that helps to draw conclusions of the whole picture. We standardized a comprehensive version of focused group discussion format which is used for this assessment. ICRISAT ensured the participation of majority local language speakers in the multidisciplinary team and structured the focus-group-discussions according to the guidelines and the specific local context. The meetings focused on the community's knowledge of the watershed program, their personal benefits as well as their assessment of the impacts for the whole community. In villages where women Self-Help-Groups (SHG's) were formed under the watershed project, a special focus was laid on discussions with the SHG members and the impacts upon women's lives of the watershed project.

The meetings also served as an opportunity to verify the records of the watershed development team where ever available and to discuss aspects such as maintenance of the structures, sustainability and other schemes implemented in the village.

FIELD VISITS

While the focus-group-discussions were held in the village, other member(s) of the team inspected a minimum of two structures considering them as samples of these physical structures such as check-dams, percolation tanks, CCTs, open wells and retaining walls, assessed their quality of construction and selection of location and measured structures on a random basis and assess their potential impacts for number beneficiaries, and extent area and on the community well-being. Individual farmers were interviewed for their gains by watershed interventions when they were spotted in the fields nearby the structures wherever possible. Sweet orange orchards and plantation of forest plants in common lands for assessment were visited.

After completing the field visits, the observations were openly shared with the participating program staff. Their comments and feedback were also included in the assessment of the watersheds.

PERIOD OF EVALUATION

Impact assessment of watersheds in Nalgonda was done 1st and 2nd weeks of December 2009, and the actual field visits took place for a week in Nalgonda district with the help of project staff of DWMA, Nalgonda.

WATERSHED-WISE IMPACT ASSESSMENT

The details of focused group discussions, assessment of watershed interventions including our observations of soil and water conservation structures (pictures) and watershed-wise impacts on watershed communities were provided here under in the suggested format for all 20 watersheds assessed during December 2009.

Impact Assessment Report
(1)Ailamma Watershed, DPAP – I batch,
Marriguda-Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch year of start 1995-96
ii. Name of the watershed:	Ailamma
iii. Names of villages in the Watershed:	Somarajguda (Anthammapet)
iv. Villages/Mandal/District:	Somarajiguda/Marriguda/Nalgonda
v. Name and Address of PIA:	DFO (TR) Nalgonda-Govt. PIA
vi. Total area of the watershed: (Treated area) ha	1039 ha of which 496 Ha treated

2. Ownership pattern of land:

i. Arable land (ha)	496 ha
ii. Non-arable land (ha)	543 ha
iii. Government/ Community land (ha)	543 ha
iv. Private land (ha)	-
v. Treated arable (ha)	478 ha
vi. Treated non-arable (ha)	18 ha

3. Verification financial and other Records

i. Total cost:		Spent: Rs 25.96 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes-CCT-22 Km , PTs- 8 No , CDs-3 No, 185- RFD, 115-LBS and Farm pond-8 No,Bunding-208ha,Afforstation-15ha, Horticulture-2ha	
iv. Whether watershed committees (WC) exits	Yes-When visited available for consultation- W President-A Yellaiah W. Chairman- B Ramulu W. Secretary –Md Janimiya	
v. If exists, activities of the committees	Not functioning-as no work and no guidelines for use of WDF fund for repair works also	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

Bore and motor pump for drinking water facility EPA spending 80, 000/- Good participation of community- following activity were done-CCT-22 Km , PT- 8 No , CD-3 No, 185 RFD, 115-LBS and Sunken ponds-8No, Bunding-208ha, Afforstation-15ha, Horticulture-2ha.

5. Qualitative Parameters of Impacts

Functioning of village level institutions	Satisfactory-Watershed committee-10 members, User Groups-9, SHG's-4 later increased to 23 without any help from watershed.	
i. Records of meetings properly updated	Yes	
ii. Liaison with scientific institutions established	Not done	
iii. Watershed Development Fund (WDF) collected?, and its utilization	Yes. Rs 2.0 lakhs Union bank of India Shivannaguda Branch not used there is no guidelines available	
iv. Self Help Groups	Started with 4 and increased to 23 SHGs	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Purchase of dairy animals, Buffalo, Sheep's, and also for purchase of agriculture inputs etc…	
Bank linkages established:	With UBI Shivanna guda branch	
v. Planned CPRs sustainable & equitable development	Planted with kanuga , Rita, Amla, Sisu, Bamboo, 55000/- Survived-30,500/- -55%, 15ha is developed with fodder grass	
vi. Benefits to weaker sections (women, dalits and landless)	All watershed activities-labor work, Micro finance activity with SHG's	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Water level increased up to 3 m and 13 wells rejuvenated, 115 new bore wells dug.
ii. Additional area under cultivation/horticulture/affore station	189 ha additional area for cultivation with wells and bore wells paddy and sweet lime etc with 2 season cropping
iii. Changes in cropping pattern and intensity	More area with double cropping and paddy area (2 crops) increased
iv. Changes in agricultural productivity	
v. Changes in fodder & fuel wood availability	Increased 5 ha land developed for pasture cattle feeding in CPR
vi. Changes in size and character of livestock holdings	Increased no of milch animals 100 buffalo and increased 150 liter milk production due to increased crop fodder production
vii. Status of grazing land & their carrying capacity	Separately pasture developed to support fodder and also increased crop production supported the fodder requirement.
viii. Employment generated due to implementation of project	Sufficient labor work for villagers and to the extent of 32,000 man days of wages generated.
ix. Change in household category, total, & source-	158 families benefited 100% rest of household 50% increased family income. Living standards increased with family due to increased income –Agriculture, Dairy and Horticulture
x. Freedom from Debt and reduction in degree of dependence of money lenders	Reduced completely. Everybody depends on banks and SHG's

Crops	Yield (q/ha)	
	Before	After
Paddy	35-40	55-60
Cotton	6-8	15-16
Cow Pea/P.Pea	4-5	8-10

xi. Reduction in out-migration (case studies)	Reduced to 50% as employment is available in the village through agriculture, horticulture and dairy activity.
xii. Reduction in drought vulnerability of the watershed	One crop season protection and 50-60% due to increased availability of water for crop production, horticulture and dairy activity
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

Learning's and process documentation (how the program could be implemented better; constraints, improvements possible, Changes made etc.) Participation of community was excellent and needs more funds for horticulture plantation with drip irrigation.

- Repair of percolation tanks, check dams, loose boulder structure, and desilting of feeder channels and removal of shrubs around structure's
- Desilting of PTs and CDs for effective functioning and utilization of valuable silt for crops growing.
- Use of drip and sprinkler irrigation systems for crops and orchards will improve water use efficiency.
- WDF fund guidelines to be established and also NREGA activity to be linked to repair and maintenance of structure and to take up agriculture related activities.

Comments of evaluator

- Good ground water increased up to 3m, 13 old wells rejuvenated and 115 new bore wells have come up for irrigation to support crops and horticulture due to PT's and CD's
- Due to the more water availability cropping increased in 189 ha area and area of paddy other crop cultivation increased due to bunding of fields for conserving moisture.
- Horticulture plantation of sweet lime was done in 8 ha with 12 farmers due to improved water availability benefited with good income.
- Afforestation in common land is very good and needs 50% planting for missing plants and pasture supported animal feeding.
- CCT work helped in increasing ground water level.

Success stories

Mr. Shankaraiah benefited with his new bore well due to CD and Percolation tank constructed around his area helped to get more water and double cropping area has been increased from 2 to 3.5ha with support of irrigation gave him a good benefit and his income has increased 1.5-2.0 fold. His family members are very happy with the watershed works.

Mr. Ramulu cultivated 1 ha of sweet lime and got on hand 2, 00,000/- due to harvest of sweet lime and his income increased 3 times. The benefit from the horticulture crop was continuous and good yields fetching him more money and all the loans were cleared by him and living happily with his family and says it is due to watershed works.

Good crop of sweet lime at Ailamma watershed

Check dams needs repair and cleaning and desilting for better

Impact Assessment Report
(2)Anantha Watershed, DPAP – I batch,
Mothkur Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Anantha
iii. Names of villages in the Watershed:	Anjapur
iv. Villages/Mandal/District:	Anjapur/Mothkur/Nalgonda
v. Name and Address of PIA:	SEERD
vi. Total area of the watershed: (Treated area) ha	522 ha----350 ha treated

2. Ownership pattern of land:

vii. Arable land (ha)	80ha
viii. Non-arable land (ha)	442 ha
ix. Government/ Community land (ha)	100 ha
x. Private land (ha)	342 ha
xi. Treated arable (ha)	80ha
xii. Treated non-arable (ha)	270ha

3. Verification financial and other Records

vi. Total cost:		Spent:
vii. Expenditure incurred as per guidelines	Yes	
viii. Works executed as per Records	Yes, LBS-50, RFD's -56 no, PT's 5 No , CD's-2no, feeder channel cleaning 1 no, roadside plantation 4000 no, Horticulture 40 ha	
ix. Whether watershed committees (WC) exits	No	
x. If exists, activities of the committees	Nil-no guidelines to use WDF fund	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

Milk collection center constructed with cost of 1, 00,000 lakh rupees

5. Qualitative Parameters of Impacts

Functioning of village level institutions	UG's-6, SHG,s-7 and increased to 25 later, Watershed committee with 12 members
vii. Records of meetings properly updated	Yes
viii. Liaison with scientific institutions established	No

ix. Watershed Development Fund (WDF) collected?, and its utilization	Yes- collected. Rs 1,00,000/- is deposited in NGB Mothkur	
x. Self Help Groups	Initially 7 SHG's and developed to 25 SHG's	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	For purchase of buffalo, sheep's and kirana shop, agric inputs purchase House hold needs, etc	
Bank linkages established:	Yes established with NGB Mothkur	
xi. Planned CPRs sustainable & equitable development	Not much—some trees were planted	
xii. Benefits to weaker sections (women, dalits and landless)	Labor activity during project, SHG's ,Dairy activity Horticulture work etc	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	1-2-1.5 m ground water level increased and 3 wells rejuvenated. 60 new bore wells came after the structure's built at different locations and increased water availability for crop production, horticulture activity and growing forage crops too.
ii. Additional area under cultivation/horticulture/affore station	Cultivation of irrigated double crop increased in 63 ha and 40 ha, horticulture area with sweet orange crop. Plantation of pongamia, teak, sisu and Rita in common land and road side.
iii. Changes in cropping pattern and intensity	Cotton, paddy, area increased -2 crops of paddy and other crops like cowpea, pigeon pea, chilies, maize etc
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	35-40	50-55
Cotton	5-8	10-12
P Pea	5-6	8-10

v. Changes in fodder & fuel wood availability	Fodder availability increased due to higher crop production of paddy and other crops
vi. Changes in size and character of livestock holdings	Increased due to additional 60 no of animals purchased with support of collection center increased milk production up to 120liter per day.
vii. Status of grazing land & their carrying capacity	Nil. Only plantation was done
viii. Employment generated due to implementation of project	Employment generated due to watershed activity and 20,000/- man days generated
ix. Change in household category, total, & source-	50% change in family living status due to additional income from Agric, dairy, horticulture and SHG's activity
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Reduced completely. No body goes to money lenders all are depending on SHG's and banks
xi. Reduction in out-migration (case studies)	Reduced 60-70% every body getting employment in the villages itself and also with NREGA's work,
xii. Reduction in drought vulnerability of the watershed	50-60 % reduction in vulnerable due to increased water availability for irrigation of crops and drinking water source ,horticulture activity, dairy activity,1-2 crop season protection

xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Participation of community was good but needs guidelines for repair works to undertake with support of NREG's and WDF fund required
- Repair of CD's PT's LBS, RFD etc for better performance
- Desilting of PT's and CD's to improve ground water recharge

Comments of evaluator

- Increased ground water level helped farmers to grow crops and get higher crop yields.
- Dairy activities is very good and increased milk production and income to farmer
- M. I. Tank repair -feeder channel cleaning helped for increasing water storage.
- PT's CD's CCT helped for ground water recharge RFD, LBS etc
- Plantation of tree's on road side 3.5 km length is very good
- SHG's helped farmer to buy agriculture inputs, dairy animals, Shops and tailoring activities with of SHG's helped activity.

Success Story

Mr. M. Somaiah: Improved income 2 times by growing 2 season paddy crops and cotton with irrigation after digging a new bore well supported by PT constructed near the field. This watershed intervention helped him for getting higher income

Fig: Percolation tank near Somaih's field

Mr. K Ramachandraiah: He has sweet lime planted in 2 ha area and he got good harvest many times and his income has gone up to 3 fold and he is very happy with watershed intervention which helped him in increasing water availability to grow sweet lime and establish the plantation too

Impact Assessment Report
(3)Boinakunta Watershed, DPAP – I batch,
Nalagonda Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	**Boinakunta**
iii. Names of villages in the Watershed:	Appajipet
iv. Villages/Mandal/District:	Appajipet / Nalgonda /Nalgonda
v. Name and Address of PIA:	ADA -SC Nalgonda
vi. Total area of the watershed: (Treated area) ha	278 ha -228 ha

2. Ownership pattern of land:

i. Arable land (ha)	178 ha
ii. Non-arable land (ha)	50 ha
iii. Government/ Community land (ha)	50ha
iv. Private land (ha)	178 ha
v. Treated arable (ha)	228 ha
vi. Treated non-arable (ha)	50 ha

3. Verification financial and other Records

i. Total cost:	20lakhs	Spent: 12.74 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes, CD's -4, PT's-3no, FP-2 and bunding of 8 ha plantation of horticulture plants 19 ha, Afforestations -2 ha	
iv. Whether watershed committees (WC) exits	Yes, WS President- Ms Rama devi; WS Chairman – Venkatreddy WS Secretary – Padma Reddy Available for consultancy	
v. If exists, activities of the committees	attending repair works as and when required with Community	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

Entry point activity was a construction of community wall with an expenditure of RS 50,000,
Besides the EPA the following works done.
CD's -4, PT-3, PP -2 and bunding of 8 ha plantation of horticulture plants 19 ha, Afforestations -2 ha

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	SHG's, UG's WA, WC-SHG's are still active mainly on Micro-finance activity
ii. Records of meetings properly updated	Yes
iii. Liaison with scientific institutions established	No – Not exposed or taken for visit on crop productivity activity

iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes, collected and deposited in Indian bank Nalgonda Rs 1 lakhs	
v. Self Help Groups	14 SHG's formed and presently 20 Groups are working	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Purchase of milch animals	
Bank linkages established:	SHG's have established bank linkage with IOB - Nalgonda	
vi. Planned CPRs sustainable & equitable development	2 ha planted with forest spices trees	
vii. Benefits to weaker sections (women, dalits and landless)	Engaged in labor work during watershed works- generated employment regularly, SHG's activity for women	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	increase in water level up to 1m and water availability increased for irrigating more area
ii. Additional area under cultivation/horticulture/affore station	19 ha under horticulture is developed 50 ha area was improved for irrigated crops 2 season and 30 ha area with one season irrigation
iii. Changes in cropping pattern and intensity	Crops maize, chilies, pigeon pea, green gram cultivated after watershed activities paddy cultivation area increased
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	35	50
Cotton	6-8	15-16
Green gram / Pigeon pea	3-4	6-8

v. Changes in fodder & fuel wood availability	Improved fodder due to higher production of paddy & Pigeon pea other crops
vi. Changes in size and character of livestock holdings	50 Milch animals added and milk yield improved to 100 liter/day
vii. Status of grazing land & their carrying capacity	Grazing lands improved common land treated, No change in fuel wood
viii. Employment generated due to implementation of project	Employment increased due to improved cropping with irrigation, and intensity double cropping and horticulture cropping
ix. Change in household category, total, & source-	House hold income increased to 50% due to agriculture, dairy and horticulture plantation
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Credit linkages of SHG's with banks established and dependency on money lender reduced to 80%
xi. Reduction in out-migration (case studies)	Migration decreased and lot of employment generated in the village itself –Now with NREG's scheme 80% reduced

xii. Reduction in drought vulnerability of the watershed	1-2 crop season protection, decreased by 50% with all the project activities, watershed structure improved water source, horticulture ,dairy and also with NREGA scheme
xiii. Detailed case studies of specific farmers impacted by the project	Horticulture plantation of many farmer's have increased the income to 200% Plant specially Sweet Orange Plantation
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Urgent need for repair of CD's and PT's –damaged structures
- Desilting of watershed structures for improving recharging of groundwater and utilization of slit as manure to crops
- Desliting of feeder channels for proper functioning of minor irrigation tanks.
- Guidelines for the use of WDF's fund

Comments of evaluator

- 8 ha is bunded and needs some more area to be covered
- Planting of missing plants in afforestation field in common lands
- Good water level increase in the watershed area, utilize water by adapting sparkler and drip irrigation for horticulture plants and vegetables.
- Need repair of CD's PT's and LBS, RFD under NREGA guidelines needed
- Migration reduced due to various activity with horticulture and agriculture dairy activity

Case studies

Mr. Govinda Reddy - a farmer benefited by planting a sweet lime plantation of 2 ha and his income increased to 2-3 times after the implementation of watershed program

Mrs. .K. Laxmi - woman farmer improved with support of purchase of 2 buffalo with loan facility and improved milk production and family income doubled

Mr. Srinivas Reddy – Check Dam constructed near his field and new bore well was dug with increased water availability cultivation of paddy and cotton increased family income doubled with watershed activity

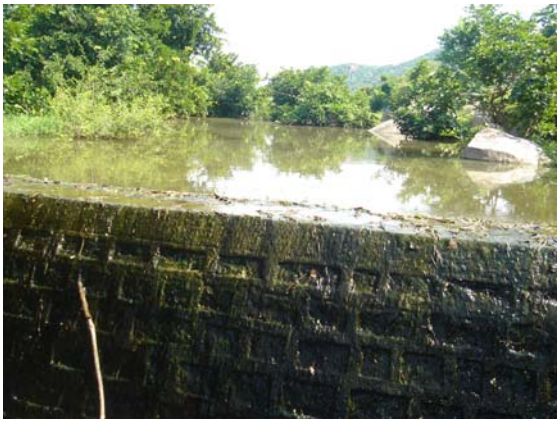


Fig: Check dam constructed near Srinivasreddy field

Impact Assessment Report
(4)Chinna Suraram Watershed, DPAP – I batch,
Thipparthy Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch Year 1996
ii. Name of the watershed:	Chinna Suraram
iii. Names of villages in the Watershed:	Suraram
iv. Villages/Mandal/District:	Suraram/Thipparthy/Nalgonda
v. Name and Address of PIA:	MPDO-Thipparthy
vi. Total area of the watershed: (Treated area) ha	514 ha (305 ha)

2. Ownership pattern of land:

i. Arable land (ha)	300 ha
ii. Non-arable land (ha)	214 ha
iii. Government/ Community land (ha)	20 ha
iv. Private land (ha)	194 ha
v. Treated arable (ha)	280 ha
vi. Treated non-arable (ha)	25 ha

3. Verification financial and other Records

i. Total cost:		Spent: 15-31 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes; RFD's - 65, FPonds -5, PT's – 3, CD's – 3, LBS – 25, Horticulture – 8 ha, Afforistation-12.5 ha, bunding – 267ha	
iv. Whether watershed committees (WC) exits	K Lingaiah - Vice-president,CH Veeraiah- Vice chairman D Narayana Reddy – Secretary. No-but available for consultancy	
v. If exists, activities of the committees	No activities – no guidelines for using WDF for repairs etc	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

No entry point activity in the watershed

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	10 user's group, WC, WA and SHG's – 8 and increased to 20 on their own. Only SHG's are active
ii. Records of meetings properly updated	YES
iii. Liaison with scientific institutions established	No – No such activity

iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes- collected RS 92,000/- balance was Rs 1,80,000/- with IOB - Nalgonda	
v. Self Help Groups	8 SHG's grown to 20 SHG's	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	loans utilized for shops, milk animals, agricultural inputs and family needs	
Bank linkages established:	Yes with IOB Nalgonda	
vi. Planned CPRs sustainable & equitable development	Afforestation -Plantation of tree's in12.5. Mainly, Pongamia, bamboo, sisu, Teak, Rita and sitapal -survival is 55%- gaps planting needed.	
vii. Benefits to weaker sections (women, dalits and landless)	Only as labor during the watershed works underway. Agriculture, Dairy and horticulture works and micro finance support for micro enterprise activity.	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Increased water level of 0.5 m and more time water availability. No problem for drinking water, 41 wells rejuvenated, 100 new Bore wells come up support agriculture, Horticulture and dairy
ii. Additional area under cultivation/horticulture/afforestation	Due to improved water availability increased Cultivation for agriculture with 2 crops in 60 ha, 10 ha horticulture, 12.5 ha afforestation
iii. Changes in cropping pattern and intensity	Improved crops cultivation of paddy, cotton, maize, chickpea green gram, pigeon pea
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Cotton	8-10	15-16
Paddy	30-35	45-50
Cowpea/pea	5-6	8-10

v. Changes in fodder & fuel wood availability	Improved fodder due to more crop production increased yields of crops.
vi. Changes in size and character of livestock holdings	Increased 60 animals and 100 liters milk production daily
vii. Status of grazing land & their carrying capacity	No change – through crop production
viii. Employment generated due to implementation of project	40% of migration reduced due to employment generated during crop period for agriculture and horticulture irrigated area expansion generated employment- 20000 man days of wages
ix. Change in household category, total, & source-	House hold income improved and 50% income about 480 families benefitted due to irrigated agricultural cultivation, horticulture fruit plantation, dairy activity and micro finance activity by SHG's
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Due to linkage of bank through SHG's Dependence reduced to 10% from money lenders.
xi. Reduction in out-migration (case studies)	Reduced 50% due to employment in village works
xii. Reduction in drought vulnerability of the watershed	50 – 60% reduced and additional area for 2 crops due to improved water availability in wells and bore wells for cultivation of crops horticulture and dairy activity.

xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

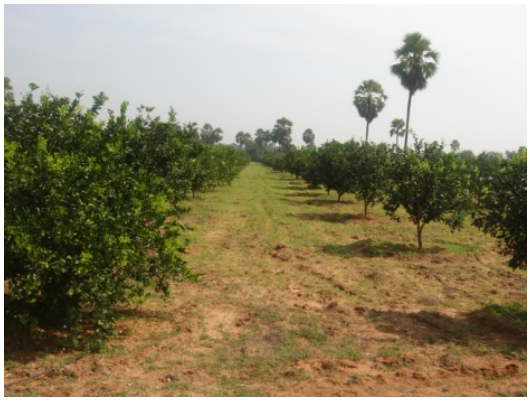
- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Repairs to be attended for RFD's , CD's PT's and LBS's
- Desilting of CD's, PT's and channels needed for proper functioning and improving ground water recharging.
- Proper guidelines needed for usage of WDF fund for repair of structures

Comments of evaluator

- Migration reduced and labor getting wages in the village
- Improved milk production in the village with increased animal population and fodder availability
- Horticulture production –sweet orange income increased the family status.
- Increased ground water up to 0.5m, wells rejuvenated and 60 new bore wells
- Bank linkage for SHG's helped villagers for easy loan facility for agriculture inputs etc
- Desiliting is required every 2 years for effective functioning of structure
- NREGA's works need to be used for repair of structure and agricultural.

Mr. Venkat Reddy: Irrigation area increased from 1.5ha to 3ha for growing two season crops with improved water availability in his well due to CD construction near his field. His income increased 2 times due to cultivation of paddy and cotton in 3 ha area and also with higher yields due to sufficient water availability.

Mr. Mallaih. Benefited due to cultivation of 1.5 ha sweet lime and income increased 3 times compared to earlier cultivation with paddy and cotton etc. His income increased helped him to improve his livelihood and feel very happy for the all support of watershed work to his family.



Fig; Sweet lime field of Mallaih given good return to him

Impact Assessment Report
(5)Dabbidikunta Watershed, DPAP – I batch,
Kattangur Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Dabbidikunta
iii. Names of villages in the Watershed:	Munikuntla
iv. Villages/Mandal/District:	Munikuntla/ Kattangur/ Nalgonda
v. Name and Address of PIA:	BIRDS & PILUPU, Kattangur
vi. Total area of the watershed:	ha (ha Treated area)

2. Ownership pattern of land:

i. Arable land (ha)	
ii. Non-arable land (ha)	
iii. Government/ Community land (ha)	
iv. Private land (ha)	
v. Treated arable (ha)	
vi. Treated non-arable (ha)	

3. Verification financial and other Records

i. Total cost:	Approved: Rs 20 Lakh ?	Spent: Rs 19.59 Lakh
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes PT (1), CD (5), Bunding (80 ha), afforestation (14 ha)	
iv. Whether watershed committees (WC) exits	Yes-; Mr. S Anandam was WA President, Mr G Shanker Reddy, was WC Chairman, Mr. K Lingaiah was WC Secretary. All these members were available for consultation.	
v. If exists, activities of the committees	Not functional due to no clear guidelines for utilizing WDF to repair and maintain structures.	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

A community hall was constructed as an entry point activity in the village to have common facility for having village meetings etc at the cost or Rs. 57,300/-; Besides EPA, construction of 5 check dams, 1 percolation tank and other conservation works were taken up with the participation of farmers from 5 user groups (UGs) and landless poor from the watershed village.

5. Qualitative Parameters of Impacts

6.

i. Functioning of village level institutions	Satisfactory during project and after as the SHGs increased from 7 to 30 without any financial help from watershed scheme.	
ii. Records of meetings properly updated	Yes	
iii. Liaison with scientific institutions established	No, farmers were not given any exposure to productivity enhancement	
iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes; collected Rs.1 50 200 according to guidelines and deposited in Nagarjuna Grameena Bank, Kattangur but unspent for maintenance works due to lack of clear guidelines	
v. Self Help Groups	SHGs increased from 7 to 30 after watershed interventions (no support from watershed program	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Loans were given to the members for purchase of buffaloes, inputs for agriculture and for establishment of shops	
Bank linkages established:	Farmers have linkage with Grameena Bank at Edulur for credit and other transactions	
vi. Planned CPRs sustainable & equitable development	14 ha of CPRs planted with *Pongamia*	
vii. Benefits to weaker sections (women, dalits and landless)	No specific initiatives; engaged for labor work during watershed works.	

7. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Impact of watershed project has clearly reflected in enhancing the groundwater levels (2 m increase) and duration of water availability in wells (doubled) for agricultural and other purposes in the watershed. Ten open wells and 300 bore wells exist in the village. Area under irrigation has been increased.
ii. Additional area under cultivation/horticulture/afforestation	32 ha additional area brought under cultivation; 14 ha common land with afforestation.
iii. Changes in cropping pattern and intensity	Before project castor, millets and paddy crops were grown; After watershed implementation, farmers shifted to cotton, pigeon pea, green gram and paddy.
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Cotton	10-12	15-18
Castor	10-12	14-16
Paddy	35-40	45-50

v. Changes in fodder & fuel wood availability	Increased water availability has improved fodder availability.
vi. Changes in size and character of livestock holdings	Number of milch cattle and milk production increased by 50 liters a day.
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	About 118 laborers had employment during project period; on implementation of project water availability enhanced additional cropping area and productivity.2600 man days labor
ix. Change in household category, total, & source-	Around 243 households improved their income through agriculture, dairying and livelihood activities.

x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Have good credit linkages with banks, micro finance of SHGs also helping and less dependence (about 40%) on private moneylenders.
xi. Reduction in out-migration (case studies)	Decreased by 50% during watershed project implementation and no migration now due to NRGES.
xii. Reduction in drought vulnerability of the watershed	Quantity and duration of groundwater availability has increased, supports early planting and groundwater will be available for about 6 months even in drought year.
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

8. **Learnings and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)

- Urgent need for repairing and maintenance of damaged water-harvesting structures.
- De-silting of water harvesting structures and removal of bushes is essential to get sustainable benefits.
- De-silting of feeder channels is urgently required.
- Guidelines are needed for using WDF.

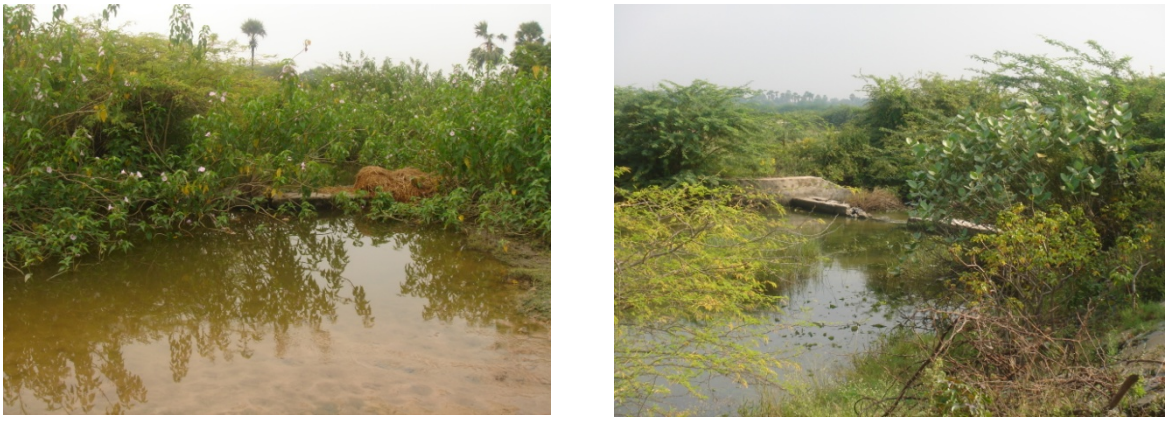


Figure 1. Masonry check dams at Dabbidikunta watershed, Munikuntla village

Comments of evaluator

- Almost all the water harvesting structures are damaged and serving no purpose. Check dams were constructed on feeder/irrigation channels and quality of construction and location of few structures is not satisfactory **(Fig. 1).**
- Water harvesting structures are filled with sediment, bushes and damaged resulting in reduced water storage hence the effectiveness of the watershed structures reduced **(Fig.2)**.

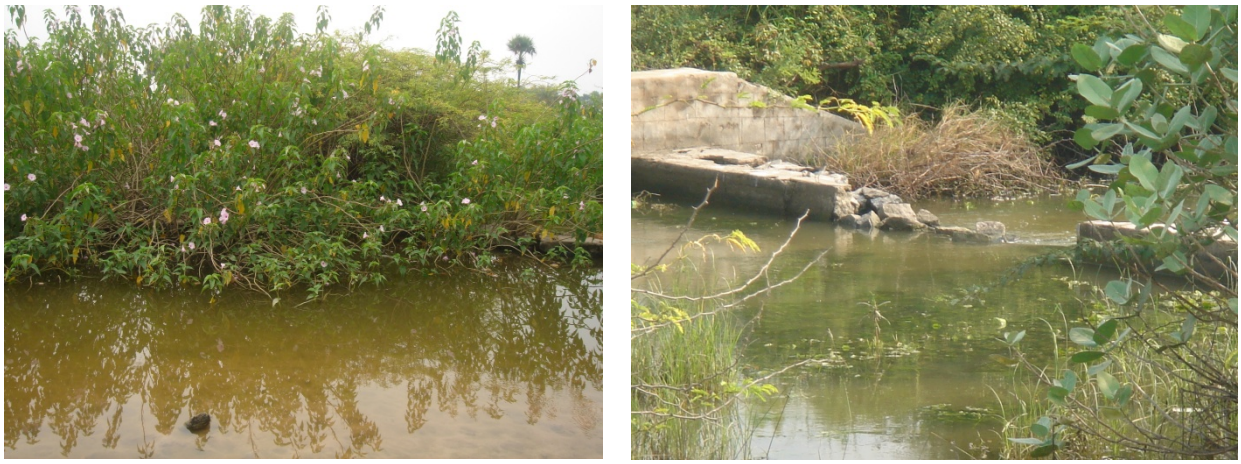


Figure 2. Check dams encroached by bushes (left) and damaged by people (right) at Dabbidikunta watershed

- Post-project maintenance was not clearly envisaged as an exit policy in the project, hence proper mechanism should be operationalized to repair and maintain the structures, and to ensure proper utilization of WDF/community contribution, clear guidelines should be in place. Otherwise watershed committee exists, but becomes defunct, as is the case with Dabbidikunta watershed.
- More area is under paddy cultivation with tank irrigation. Crop productivity enhancement and water use efficiency measures were not emphasized in the project to harness the full benefits of project activities.
- Technology Resource organizations like academic/research institutions involvement was absent.
- As admitted by farmers in the village, availability of drinking water round the year, supplemental irrigation water for second crop and ground water increase helping growth of agriculture are the visible qualitative and quantitative impacts due to watershed development.

Success story

- **Mr. B Gopal** is one of the beneficiaries of watershed activities. He has one bore well in his 0.8 ha land and growing two (irrigated) crops in a year. Before watershed interventions
- he used to grow irrigated crop during rainy season only. After watershed project implementation groundwater availability has increased and growing irrigated crops during two seasons.
- **Mr. N. Saidulu** owns 4 ha land and one of the beneficiaries from increased groundwater availability. He dug one bore well and growing irrigated crop in about 1 ha area during rainy season.

Impact Assessment Report
(6)Devunigutta Watershed, DPAP – I batch,
Gundal Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii Name of the watershed:	Devunigutta
iii Names of villages in the Watershed:	Brahmanpally
iv Villages/Mandal/District:	Devunigutta / Gundal / Nalgonda
v Name and Address of PIA:	APD (E) MDT IV
vi Total area of the watershed:	ha (ha Treated area) 563

2. Ownership pattern of land:

i Arable land (ha)	400
ii Non-arable land (ha)	163
iii Government/ Community land (ha)	58
Iv Private land (ha)	105
v Treated arable (ha)	295
vi Treated non-arable (ha)	105

3. Verification financial and other Records

i Total cost:	Approved: Rs 20 Lakh?	Spent: Rs 20.05 Lakh
ii Expenditure incurred as per guidelines	Yes	
iii Works executed as per Records	Yes PT (3), CD (15), farm Pond-3 Bunding (228 ha), afforestation (15 ha), Horticulture-3ha	
ivWhether watershed committees (WC) exits	Yes-; Mr. J.Narsaih was WA President, Mr. M.Somaih, was WC Chairman, Mr. Ramchandra was WC Secretary. All these members were available for consultation.	
v If exists, activities of the committees	Not functional due to no clear guidelines for utilizing WDF to repair and maintain structures.	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

A milk collection center constructed with Rs 1, 00,000 lakh cost as an entry point activity in the village to have common facility for milk Besides EPA, construction of 15 check dams, 3 percolation tank and 228ha bunding, 15 h Afforestation other conservation works were taken up with the participation of farmers from 5 user groups (UGs) and landless poor from the watershed village.

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	Satisfactory during project and after as the SHGs increased from 10 to 18 without any financial help from watershed scheme.
Ii .Records of meetings properly updated	Yes
iii .Liaison with scientific institutions established	No, farmers were not given any exposure to productivity enhancement

iv Watershed Development Fund (WDF) collected?, and its utilization	Yes; collected Rs.1 07 000 according to guidelines and deposited in Nagarjuna Grameena Bank, Mothkur but unspent for maintenance works due to lack of clear guidelines	
v Self Help Groups	SHGs increased from 10 to25 after watershed interventions (no support from watershed program	Revolving fund: Utilized fully
V.O functioning:		Savings:
Utilization of loans:	Loans were given to the members for purchase of buffaloes, inputs for agriculture and for establishment of shops	
Bank linkages established:	Farmers have linkage with Nagarjuna Grameena Bank at Mothkur for credit and other transactions	
vi Planned CPRs sustainable & equitable development	15 ha of CPRs planted with *Pongamia* 12,000 plants planted and 4km road side plantation	
vii Benefits to weaker sections (women, dalits and landless)	No specific initiatives; engaged for labor work during watershed works.	

6.Quantitative Parameters of Impacts

i Improvements in water table/water availability	Impact of watershed project has clearly reflected in enhancing the groundwater levels (1.5 m increase) and duration of water availability in wells (doubled) for agricultural and other purposes in the watershed. Ten open wells and 30 new bore wells dugged in the village. Area under irrigation has been increased.
ii Additional area under cultivation/horticulture/afforestation	58 ha additional area brought under cultivation; 14 ha common land with afforestation.
iii Changes in cropping pattern and intensity	Before project castor, millets and paddy crops were grown; After watershed implementation, farmers shifted to cotton, pigeon pea, green gram and paddy.
Iv Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Cotton	8-10	14-16
Castor	8-10	13-15
Paddy	35-40	45-50

v Changes in fodder & fuel wood availability	Increased water availability has improved fodder availability.
Vi Changes in size and character of livestock holdings	20 Number of milch cattle increased and milk production increased by 50 liters a day.
Vii Status of grazing land & their carrying capacity	No change
Viii Employment generated due to implementation of project	About 100 laborers had employment during project period; on implementation of project water availability enhanced additional cropping area and productivity.21800 man days labor
ix Change in household category, total, & source-	Around 211 households improved their income through agriculture, dairying and livelihood activities.
x Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Have good credit linkages with banks, micro finance of SHGs also helping and less dependence on private moneylenders.
xi Reduction in out-migration (case studies)	Decreased by 65% during watershed project implementation and no migration now due to NRGES.

xii Reduction in drought vulnerability of the watershed	Quantity and duration of groundwater availability has increased, supports early planting and groundwater will be available for about 6 months even in drought year.
xiii Detailed case studies of specific farmers impacted by the project	
xiv Photographs showing work + its impact	

Learning's and process documentation (how the program could be implemented better; constraints, improvements possible, Changes made etc.)

- Urgent need for repairing and maintenance of damaged water-harvesting structures.
- De-silting of water harvesting structures and removal of bushes is essential to get sustainable benefits.
- De-silting of feeder channels is urgently required.
- Guidelines are needed for using WDF.

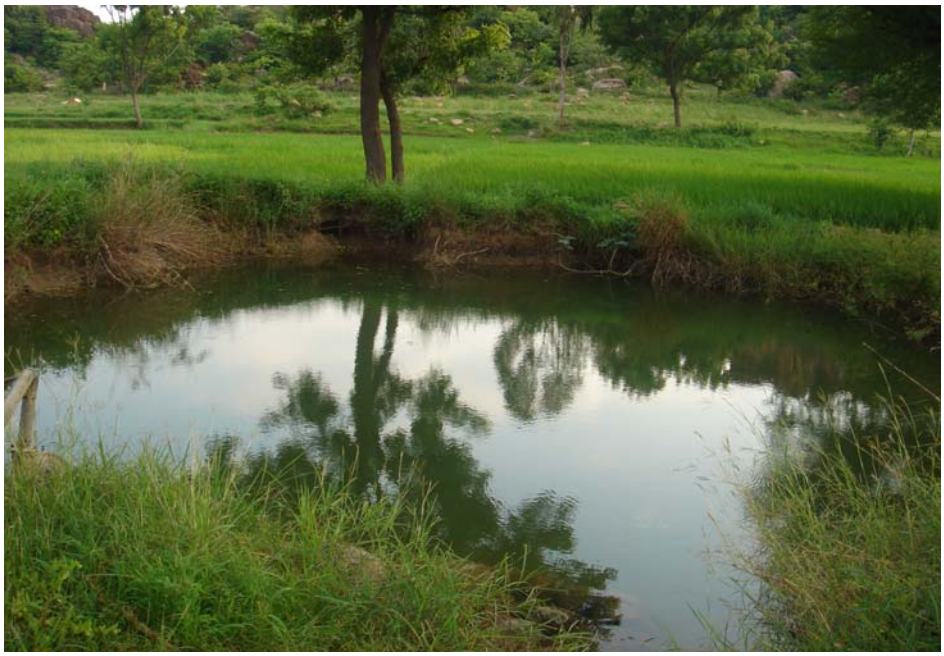
Comments of evaluator

- Many water harvesting structures are damaged and serving no purpose. Water harvesting structures are filled with sediment, bushes and damaged resulting in reduced water storage hence the effectiveness of the watershed structures reduced
- Post-project maintenance was not clearly envisaged as an exit policy in the project, hence proper mechanism should be operational zed to repair and maintain the structures.
- More area is under paddy cultivation with tank irrigation. Crop productivity enhancement and water use efficiency measures were not emphasized in the project to harness the full benefits of project activities.
- Technology Resource organizations like academic/research institutions involvement was absent.
- As admitted by farmers in the village, availability of drinking water round the year, supplemental irrigation water for second crop and ground water increase helping growth of agriculture are the visible qualitative and quantitative impacts due to watershed development.

Success story

- **Mr. M.Somaih** is one of the beneficiaries of watershed activities. He has one open well in his 1.5 ha land and growing two paddy crops in a year. Before watershed interventions he used to grow irrigated crop during rainy season only. After watershed project implementation groundwater availability has increased and growing irrigated crops during two seasons.

- **Mr. M.Swamy** owns 2 ha land and one of the beneficiaries from increased groundwater availability. He dug one bore well and growing irrigated crop in about 1 ha area during rainy season.



Fig; Increased water level (November 2009) in Somaih's well and good crop of paddy grown.

Impact Assessment Report

(7)Ganya nayak Thanda Watershed, DPAP – I batch,

Devarkonda Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Ganya nayak Thanda
iii. Names of villages in the Watershed:	Chennaram
iv. Villages/Mandal/District:	Chennaram/Devarkonda/Nalgonda
v. Name and Address of PIA:	DASM K Mallepally
vi. Total area of the watershed: (Treated area) ha	505 ha

2. Ownership pattern of land:

i. Arable land (ha)	473 ha
ii. Non-arable land (ha)	32 ha
iii. Government/ Community land (ha)	5 ha
iv. Private land (ha)	27 ha
v. Treated arable (ha)	473 ha
vi. Treated non-arable (ha)	32 ha

3. Verification financial and other Records

i. Total cost:		Spent: 19.72 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes, CD's -14, PT-11, Farmpound-5, Bunding-60, LBS -123, RFDs-27, CCT-20.5km	
iv. Whether watershed committees (WC) exits	Yes, WS President-R Ramkoti; WS Chairman – R Panthulaiah; WS Secretary – R Jawarlal All ST's 2 Women in WC	
v. If exists, activities of the committees	In formal functioning for meeting of evaluator's official and visitors.	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

Bore well was provided with the expenditure of Rs 30,000/- for drinking water purpose in the community

Forest plants planted 33,000/- and 60% Survive in non arable lands of 12ha. Bunding covered for 60 ha CD's -14, PT-11, Farm pond -5, LBS-123, RFD-27, CCT-20.5 km

5. Qualitative Parameters of Impacts

Functioning of village level institutions	User's group not functioning-8 no SHG's increased to 20 from 11 and rotated money among members and got benefited.	
i. Records of meetings properly updated	Yes	
ii. Liaison with scientific institutions established	No farmers were given exposure to productivity enhancement related work	
iii. Watershed Development Fund (WDF) collected?, and its utilization	Yes, RS 70,000/- collected for various activity as per guidelines and deposited in Nalgonda grammeena bank, K Mallepally	
iv. Self Help Groups	Rotated the finance among the group members grown from 11-20 groups	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Purchase milk animals, Agric inputs, sheep's and kirana shops purpose	
Bank linkages established:	Yes, Nagarjuna grammena bank K Mallepally Andhra bank Devarkonda	
v. Planned CPRs sustainable & equitable development	14 ha planted with forest species plants and of the 20000 plants only 60% survived	
vi. Benefits to weaker sections (women, dalits and landless)	Engaged in labor work of watershed works during project regular wage available. SHG's ,Dairy activity benefited	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	3 m water level increased, 38 wells were rejuvenated, 14 wells were dugged and many bore wells were dugged after watershed work completed. There is no problem for drinking water and good water available for crop growing.
ii. Additional area under cultivation/horticulture/afforestation	Afforestation area of 12 ha increased Horticulture -2 ha, 50 ha are improved for double cropping 103 farmers benefited
iii. Changes in cropping pattern and intensity	Paddy area increased and with good crop yields due to sufficient water availability. Other crops like cotton and pigeon pea are benefited due to irrigation. Horticulture (sweet lime) plantations benefited lot with good income.
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	30-35	45
Pigeon pea	5-6	8-10
Cotton	8-10	15-16

v. Changes in fodder & fuel wood availability	Fodder availability increased due to increased production of paddy and pigeon pea crop.
vi. Changes in size and character of livestock holdings	40 new Milk animal increased and milk yield improved to 80 liter/day
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	Employment increased due to improved cropped area and intensity double cropping due to availability of water about 23000 man days of employment generated
ix. Change in household category, total, & source-	House hold income increased to 50-60% due to agriculture dairy and horticulture activity

x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Reduced to 45 % due to SHG's microform system facility loan among the group members
xi. Reduction in out-migration (case studies)	80%reduction in migration due to increased employment in agricultural and horticultural activity also dairy activity and recent NREGA's works
xii. Reduction in drought vulnerability of the watershed	Reduced to 60% as water availability is very good, cropping area increased, dairy activity and horticulture etc
xiii. Detailed case studies of specific farmers impacted by the project	With all the rainwater harvesting structure in place New wells dugged and benefited to farmers in improving the livelihood –Yes
xiv. Photographs showing work + its impact	

Learning's and process documentation (how the program could be implemented better; constraints, improvements possible, Changes made etc.)

- Urgent need for removal of silt from check dams for effective functioning for groundwater recharge
- Repair of structures CDs, PTs, LBs and RFDs
- Gully control structure stone's displacement need to be repaired
- Some more area of bunding is required for improving soil moisture conservation
- Clear policy for usage of WDF is required and also NREGA's guidelines for work

Comments of evaluator

- Good water level increased and wells were benefited, water availability improved double cropping area and horticulture activity
- Afforestation work is very good and survival of plants in CPR is good
- Migration reduced to 80% labor wages improved
- Micro finance activity of SHG's helped in reducing the dependence of the money lender
- CCT's work improved ground water recharge effectively

Success Story

Mrs Swaroopa a woman farmer improved with the support of watershed benefited by improving crop yield with support of new well dugged after the CD structure build near her field. Her income also doubled by growing 2 crops in her field and improved income to support her family well

Mr.Jawarhalal a farmer benefited with improved water availability in the wells in his field after the CD was constructed near his field and his income increased to 2 times by growing crops in 2 seasons paddy and maize.

Impact Assessment Report

(8)Gayamvarigudam Watershed, DPAP – I batch,

Chivemela Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Gayamvarigudam
iii. Names of villages in the Watershed:	Gayamvarigudam
iv. Villages/Mandal/District:	Gayamvarigudam / Chivemela /Nalgonda
v. Name and Address of PIA:	DFO (SF) Nalgonda
vi. Total area of the watershed: (Treated area) ha	483 ha

2. Ownership pattern of land:

i. Arable land (ha)	413
ii. Non-arable land (ha)	20
iii. Government/ Community land (ha)	50
iv. Private land (ha)	413
v.Treated arable (ha)	413
vi.Treated non-arable (ha)	20

3. Verification financial and other Records

i. Total cost:		Spent: 16.45 lakhs
ii.Expenditure incurred as per guidelines	Yes	
iii.Works executed as per Records	Yes, CD's -3, PT-10, Farmpound-1, Bunding-145ha, LBS -280, RFDs-50, CCT-3.5km Afforestation 2ha	
iv.Whether watershed committees (WC) exits	Yes, WS President-N.Mohan; WS Chairman – R Mohan; WS Secretary – G.Ramesh 5 SC/ST's 3 Women in WC	
v.If exists, activities of the committees	In formal functioning for meeting of evaluator's official and visitors.	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

Community hall was constructed with the expenditure of Rs 90,000

CD's -3, PT-10, Farmpound-1, Bunding-145ha, LBS -280, RFDs-50, CCT-3.5km Afforestation 2ha.Desilting and strengthening bund of MI Tank and approach cannel cleaning.

5. Qualitative Parameters of Impacts

Functioning of village level institutions	User's group not functioning-5 no SHG's increased to 15 from 7 and rotated money among members and got benefited.

i Records of meetings properly updated	Yes	
ii Liaison with scientific institutions established	No farmers were given exposure to productivity enhancement related work	
Iii Watershed Development Fund (WDF) collected?, and its utilization	Yes, RS 84,000/- collected for various activity as per guidelines and deposited in State Bank of Hyderabad ADB Suryapet	
Iv Self Help Groups	Rotated the finance among the group members grown from 7-15 groups	Revolving fund: Utilized fully
V.O functioning:		Savings:
Utilization of loans:	Purchase milk animals, Agric inputs, sheep's and kirana shops purpose	
Bank linkages established:	Yes, State Bank of Hyderabad ADB Suryapet	
V Planned CPRs sustainable & equitable development	2 ha planted with forest species plants and of the 800 plants and 76% survived Pongamia, Sisu, Subabul	
Vi Benefits to weaker sections (women, dalits and landless)	Engaged in labor work of watershed works during project regular wage available. SHG's ,Dairy activity benefited	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	2-2.5m water level increased, 40 wells were rejuvenated, 30 wells were dugged and many bore wells were dugged after watershed work completed. There is no problem for drinking water and good water available for crop growing.
ii. Additional area under cultivation/horticulture/Afforestation	Afforestation area of 2 ha increased 60 ha are improved for double cropping
iii. Changes in cropping pattern and intensity	Paddy area increased and with good crop yields due to sufficient water availability. Other crops like cotton and pigeon pea, chilies, maize are benefited due to irrigation..
iv. Changes in agricultural productivity	
v. Changes in fodder & fuel wood availability	Fodder availability increased due to increased production of paddy and pigeon pea crop.
vi. Changes in size and character of livestock holdings	50 new Milk animal increased and milk yield improved to 100 liter/day
vii. Status of grazing land & their carrying capacity	2ha Stylosyntesis grass seeds were broadcasted and also distributed to farmers good support for grazing
viii. Employment generated due to implementation of project	Employment increased due to improved cropped area and intensity double cropping due to availability of water about 22000 man days of employment generated
ix. Change in household category, total, & source-	House hold income increased to 50-60% due to agriculture dairy and horticulture activity
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Reduced to75 % due to SHG's micro finance system facility loan among the group members
xi. Reduction in out-migration (case studies)	70%reduction in migration due to increased employment in agricultural and horticultural activity also dairy activity and recent NREGA's works

Crops	Yield (q/ha)	
	Before	After
Paddy	30-35	45
Pigeon pea	5-6	8-10
Cotton	8-10	15-16

xii. Reduction in drought vulnerability of the watershed	One crop season protection as water availability is very good, cropping area increased, dairy activity and horticulture etc
xiii. Detailed case studies of specific farmers impacted by the project	With all the rainwater harvesting structure in place New wells dugged and benefited to farmers in improving the livelihood –Yes
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Urgent need for removal of silt from check dams for effective functioning for groundwater recharge
- Repair of structures CDs, PTs, LBs and RFDs is needed
- Gully control structure stone's displacement need to be repaired
- Bunding repair is required for improving soil moisture conservation
- Clear policy for usage of WDF is required and also NREGA's guidelines for work

Comments of evaluator

- Good water level increased and wells were benefited, water availability improved double cropping area and horticulture activity
- Afforestation work is very good and survival of plants in CPR is good
- Migration reduced to 70% labor wages improved
- Micro finance activity of SHG's helped in reducing the dependence of the money lender
- CD's,CCT's and PT's work improved ground water recharge effectively
- Desilting and strengthening bund of MI Tank and approach cannel cleaning helped farmer to store more water in MI tank.

Success Story

Mr. Lingareddy. With the support of watershed benefited by improving crop yield with support of new well dugged after the CD structure build near his field. His income also doubled by growing 2 crops in his1.5 ha field and improved wealth to support his family well

Mr.D.Mohan farmer benefited with improved water availability in the wells in his field after the CD was constructed near his field and his income increased to 2 times by growing crops in 2 seasons paddy and cotton with 2ha land.

Fig; Check Dam constructed near Md Mohan's field improved water availability in his well

Impact Assessment Report

(9)Janampally Watershed, DPAP – I batch,

Janampally Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Janampally
iii. Names of villages in the Watershed:	Janampally
iv. Villages/Mandal/District:	Janampally/Janampally/Nalgonda
v. Name and Address of PIA:	NEED
vi. Total area of the watershed: (Treated area) ha	

3. Ownership pattern of land:

i. Arable land (ha)	
ii. Non-arable land (ha)	
iii. Government/ Community land (ha)	
iv. Private land (ha)	
v. Treated arable (ha)	
vi. Treated non-arable (ha)	

4. Verification financial and other Records

i. Total cost:		Spent: 16.88
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes, CCT 6.1 km long, PTs- 4, CDs-1, Bunding- 333ha, 20 ha afforestation, 7 Ha horticulture	
iv. Whether watershed committees (WC) exits	W.President- M.Maheswar, Watershed Secretary-K Ramulu, Watershed Chairman- Sudarshan	
v. If exists, activities of the committees	.No activity	

5. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

EPA: Bore well with expenditure of 1 lakh done

6. Qualitative Parameters of Impacts

i. Functioning of village level institutions	.UG's-6, SHG's -13, WC-1,WA-1, Only SHG s are functioning
ii. Records of meetings properly updated	Yes
iii. Liaison with scientific institutions established	No

iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes collected and deposited 1 lakh NGB Ramannapet	
v. Self Help Groups	Very active. No increased from 13-22 SHG's	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Micro finance activity Purchase of dairy animals, Sheep's etc	
Bank linkages established:	Established with NGB -Ramannapet	
vi. Planned CPRs sustainable & equitable development	Only plantation is done in some area and not established 50% plants only survived	
vii. Benefits to weaker sections (women, dalits and landless)	Only through labor activity in construction, Plantation and bunding	

7. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Very good water availability and water table increased to 1.5—2.5 m. Old wells rejuvenated 10 no and 75 new bore wells came up in treated area
ii. Additional area under cultivation/horticulture/affore station	Due to additional water availability in wells 53 ha area double cropping with irrigation increased for cultivation of paddy and cotton
iii. Changes in cropping pattern and intensity	Horticulture crops, paddy area increased with double cropping in 50 ha area.
iv. Changes in agricultural productivity	
v. Changes in fodder & fuel wood availability	Fodder availability increased due to increased yields in crops.
vi. Changes in size and character of livestock holdings	40 new animals added for milk production and additional 100 liter milk production increased.
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	Very good employment opportunity with various watershed activities. And to the extent of 22417 man days generated
ix. Change in household category, total, & source-	Small farmers 312, Marginal farmers-126, other 62, 50-60% increased
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Reduced completely only 10% people are depend on money lenders all are making use of SHG's and banks NGB
xi. Reduction in out-migration (case studies)	Reduced due to work availability in the village
xii. Reduction in drought vulnerability of the watershed	Drought vulnerability reduced to 60% because of increased water availability for horticulture, agriculture and dairy activity.
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

Crops	Yield (q/ha)	
	Before	After
Cotton	6-8	15-16
Paddy	30-35	45-50
C. Pea/P.Pea	5-6	8-10

Learning's and process documentation (how the program could be implemented better; constraints, improvements possible, Changes made etc.)

- Repair of CD's and PT's and LBS and RFDs and CCT's for better functioning
- Removal of silt from PT'S and CD's for recharge of ground water effectively.
- Horticulture activity to be enhanced for better benefits.
- WDF fund utilization of guide lines are regulated for better benefits

Comments of evaluator

- Improved ground water level in wells and bore wells made good impact, area under double cropping increased
- Due to bunding moisture conservation, reduced, erosion and runoff helped to grow very good crops
- CCT's helped in arresting water for ground water recharge
- SHG'S are very active and micro finance activity helped women farmers in using money for various activities for improving family income
- Dairy activity has helped most of the farmers for increasing income to family
- Horticulture crops mainly sweet orange helped their income 2-3 fields due to good yield.

Success Story

Mr. Janardhan Reddy: Planted horticulture crop sweet orange in 2 acres fetched 1.5 lakh worth yield, 2 times in a year and his income was increased. He is very happy with watershed support in his development.

Mr. Chandraiah: He has grown cotton and paddy crops with his well water after rejuvenating due to PT constructed near his field fetched more yields and income. His income increased 2.5 times and he is very happy with the watershed activity.

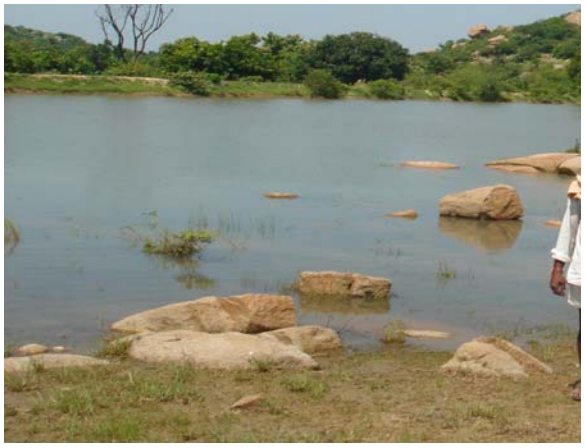


Fig: Percolation tank near Chnadraih's field improved water availability in his well

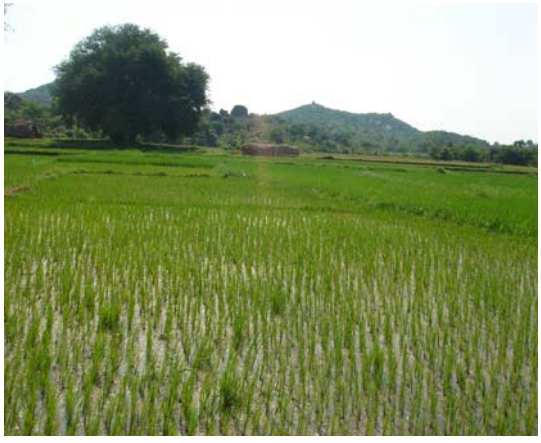


Fig: Good paddy crop below Percolation tank near Chnadraih's field

Impact Assessment Report
(10)Kalaparuksham Watershed, DPAP – I batch,
Chandampet-Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch 1995-1996
ii. Name of the watershed:	Kalaparuksham
iii. Names of villages in the Watershed:	Kethepally
iv. Villages/Mandal/District:	Kethepally/ Chandampet/ Nalagonda
v. Name and Address of PIA:	ADA(SC), Devarakonda
vi. Total area of the watershed: (Treated area) ha	775ha- treated(510ha)

2. Ownership pattern of land:

i. Arable land (ha)	548ha
ii. Non-arable land (ha)	227ha
iii. Government/ Community land (ha)	215ha
iv. Private land (ha)	12ha
v. Treated arable (ha)	360ha
vi. Treated non-arable (ha)	150ha

3. Verification financial and other Records

i. Total cost:	₹20 lakhs	Spent: ₹ 18.5 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes. RFD's:69, LBS: 81no, FP-10no, CD's:2, PT-10no	
iv. Whether watershed committees (WC) exits	W President: E.Narayana Reddy, W. Chairman: E.Hanumanth Reddy W Secretary: K.Laskar	
v. If exists, activities of the committees	.no activity	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

EPA- Renovation of temple with . 78000

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	5-UG, 3-SHG, WC, WA Only SHG's are functioning and increased to 12 SHGs
ii. Records of meetings properly updated	Yes
iii. Liaison with scientific institutions established	No
iv. Watershed Development Fund (WDF) collected?, and its utilization	Collected and 61000/- is deposited in NGB Devarkonda

v. Self Help Groups	3 SHGs increased to 12 SHGs	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Rotation of funds of SHG's for purchasing	
Bank linkages established:	Purchase of dairy animals, agric inputs, shops and micro enterprise activity	
vi. Planned CPRs sustainable & equitable development	Teak Plantation of 1500 plants(910 survived), horticulture plants, lake Amla, papaya, Guava, babul – 12500(8250 survived)	
vii. Benefits to weaker sections (women, dalits and landless)	Benefit not direct– labor wages in watershed activity for construction work. Dairy and SHG's activity	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Water level increased 2.5-3.0 m very good rise in water level Rejuvenated old wells – 15no, 24 new wells dug and new bore wells 120 No
ii. Additional area under cultivation/horticulture/affore station	92ha is additionally brought under irrigation with wells for double cropping
iii. Changes in cropping pattern and intensity	Paddy cultivation area is increased t Cotton cal ppea, cowpea, green gram, chilies
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	35-40	45-50
Cotton	10-12	16-17
Green gram/ Cowpea	5-6	8-10

v. Changes in fodder & fuel wood availability	Fodder availability is sufficient with increased paddy cultivation
vi. Changes in size and character of livestock holdings	Increased due to watershed support 100 animals added with milk production of 120 liter additional
vii. Status of grazing land & their carrying capacity	Nil-no change
viii. Employment generated due to implementation of project	Employment generated 50% reduced 22000/- man days labor wages was generated
ix. Change in household category, total, & source-	60% household income increase through agriculture and dairying activity
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Reduced to 85% only 15% people still depend on private sector Bank linkages with SHGs helped to support family very well
xi. Reduction in out-migration (case studies)	Reduced to 60%Wages generated due to irrigated agriculture activity, horticulture ,dairy activity
xii. Reduction in drought vulnerability of the watershed	50-55% of the production increased with add level Water availability with wells and bore wells production of agriculture crops doubled
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Repair of PTs, CDs and repair of LBS, RFDs
- Desilting and applying of silt to crops is required to take it as priority
- WDF fund utilization needs clear guidelines
- Remove shrub plants and PTs and CDs for better performance and reduce damage.
- Bund of PT and head wall of outlet to be repaired

Comments of evaluator

- Good improvement in ground water availability with wells and bore wells and rejuvenated old wells increased crop production with support of irrigation
- SHGs have done good work for i supporting family for daily and agricultural activity
- NREGA works to be support – agriculture works and repair works with guidelines
- Improved irrigation system need to be encouraged for growing crops
- Plantation is very good Teak-60% survival

K.Achaiah: with new PT near his field additional area of 2ha to 3 ha for irrigation with his well with increased water availability for growing crops in 2 seasons. Due to this his income increased 200% to support his family very well. The watershed activity has developed his family

Mrs. MallaReddy: the new CD constructed near the field has increased the water level in the well and area for irrigation increased 1.5 to 2.5ha and double cropping of the area supported very well. His income has increased 250% and developed due to watershed activity.

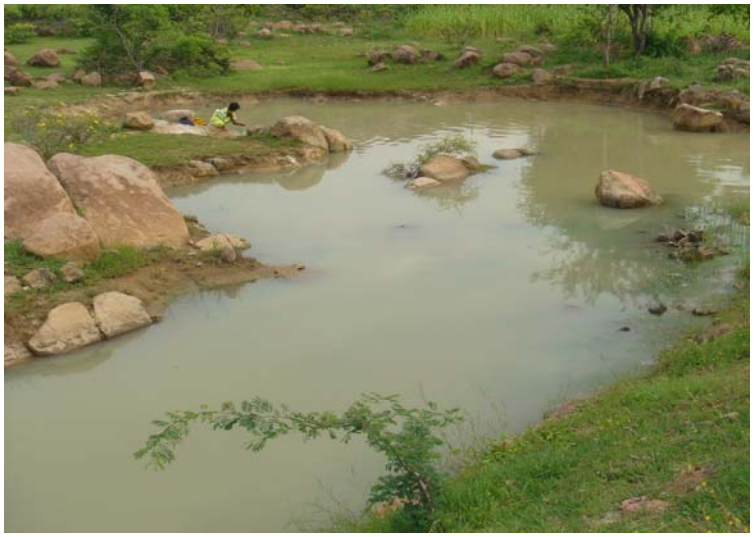


Fig: Percolation tank near Achaih's field recharging wells for irrigating crops

(11)**Laxmamma Watershed, DPAP – I batch, Marriguda Mandal,Nalgonda district, Andhra Pradesh**

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Laxmamma
iii. Names of villages in the Watershed:	Sarampet
iv. Villages/Mandal/District:	Sarampet/ Marriguda/ Nalgonda
v. Name and Address of PIA:	DFO (TR) Nalgonda, Govt. PIA
vi. Total area of the watershed:	500 ha (ha Treated area)

2. Ownership pattern of land:

i. Arable land (ha)	
ii. Non-arable land (ha)	
iii. Government/ Community land (ha)	
iv. Private land (ha)	
v. Treated arable (ha)	
vi. Treated non-arable (ha)	

3. Verification financial and other Records

i. Total cost:	Approved: Rs 20 Lakh ?	Spent: Rs 26.88 Lakh ?
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes PT (7), Dugout/ sunken ponds (30 Nos.), CD (4), Bunding (180 ha), horticulture (1 ha), afforestation (10 ha)	
iv. Whether watershed committees (WC) exits	YesWC comprises of 5 members (5 men); Mr D Mangath was WA President, Mr M Mutyalu, was WC Chairman, Mr. N Danaiah was WC Secretary. All these members were available for consultation.	
v. If exists, activities of the committees	Not functional due to any clear guidelines for utilizing WDF to repair and maintain structures.	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

A water tank was constructed for village water supply under EPA activity; Besides EPA, construction of 4 check dams, 7 percolation tanks, 30 Dugout ponds and other conservation works were taken up with the participation of farmers from 15 user groups (UGs) and landless poor from the watershed village.

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	Satisfactory during project and after as the SHGs increased from eight to eleven without any financial help from watershed scheme.
ii. Records of meetings properly updated	Yes

iii. Liaison with scientific institutions established	No, farmers were not given any exposure to productivity enhancement	
iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes; collected Rs.59 000 according to guidelines and deposited in UBI, Shivannaguda but unspent for maintenance works due to lack of clear guidelines on use from District Authorities.	
v. Self Help Groups	SHGs increased from 8 to 11 after watershed interventions (no support from watershed program	Revolving fund: Rs. 55 000
V.O functioning:		Savings:
Utilization of loans:	Loans were given to the members for purchase of buffaloes and inputs for vegetables production	
Bank linkages established:	Farmers have linkage with Union Bank of India for credit and other transactions	
vi. Planned CPRs sustainable & equitable development	Nil	
vii. Benefits to weaker sections (women, dalits and landless)	No specific initiatives; engaged for labor work during watershed works.	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Impact of watershed project has clearly reflected in enhancing the groundwater levels (1 m increase) and duration of water availability in wells (doubled) for agricultural and other purposes in the watershed. More number of bore wells was dug after watershed interventions.
ii. Additional area under cultivation/horticulture/afforestation	45 ha additional area brought under cultivation; 1 ha private land with horticulture; 10 ha common land with afforestation.
iii. Changes in cropping pattern and intensity	Before project sorghum, millets, pigeon pea and paddy crops were grown; After watershed implementation farmers shifted to other annual crops such as castor, cotton along with paddy and pigeon pea.
iv. Changes in agricultural productivity	
v. Changes in fodder & fuel wood availability	No change
vi. Changes in size and character of livestock holdings	Cattle population is decreasing due to no market/no collection center for milk.
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	About 100 laborers had employment during project period; on implementation of project water availability enhanced additional cropping area and productivity.
ix. Change in household category, total, & source-	Around 200 households improved their income through agriculture and livelihood activities.
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Have good credit linkages with banks, micro finance of SHGs also helping and 50% reduction in dependence on private moneylenders.

Crops	Yield (q/ha)	
	Before	After
Cotton	10	15
Pigeon pea	5	8
Paddy	30	50

xi. Reduction in out-migration (case studies)	Labor migration decreased during watershed project and very less migration now due to NRGES.
xii. Reduction in drought vulnerability of the watershed	Quantity and duration of groundwater availability has increased and about 50% reduction in drought vulnerability.
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

7. **Learnings and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)

- Repair, maintenance and de-silting of water harvesting structures are essential to get sustainable benefits.
- Recharging of dry open wells near small streams would have given better equity and results.
- De-silting and deepening of village tanks and percolation tanks can improve water harvesting.
- Guidelines are needed for using WDF

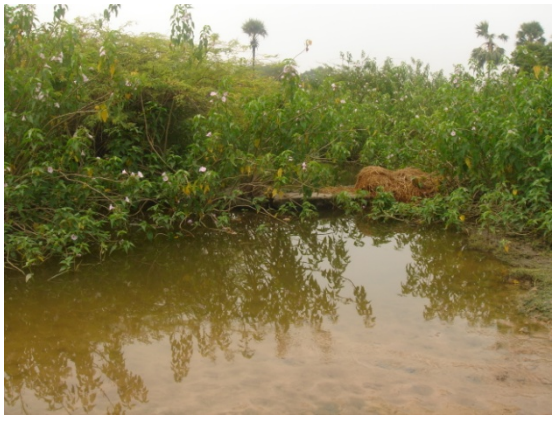


Figure 1. Masonry check dam at Pragathi watershed,

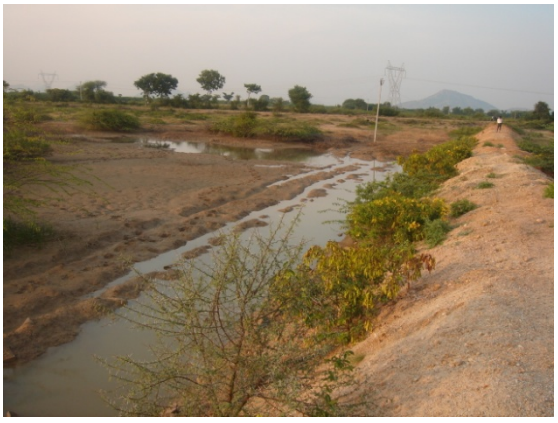


Figure 2. Percolation tank, Pragathi watershed.

Comments of evaluator

- Locations and quality of construction of WHS are good and improved the ground water availability. Number of bore wells increased considerably after watershed interventions **(Fig. 1 & 2).**
- Water harvesting structures are filled with sediment, bushes and developed leakages resulting in reduced water storage hence the effectiveness of the watershed structures reduced **(Fig.3)**.

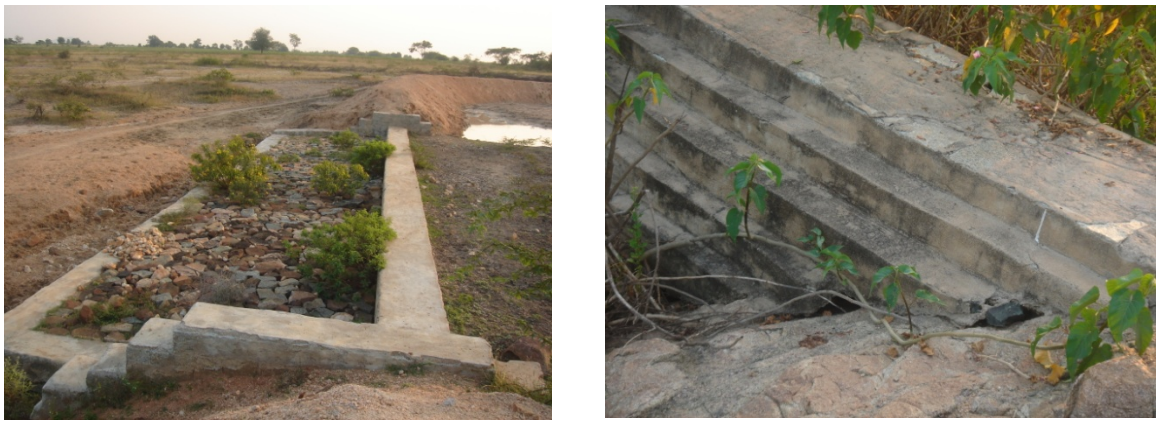


Figure 3. PT filled with sediment (left) and CD developed leakages (right), Pragathi watershed

- Post-project maintenance was not clearly envisaged as an exit policy in the project, hence proper mechanism should be operationalzed to repair and maintain the structures, and to ensure proper utilization of WDF/community contribution, clear guidelines should be in place. Otherwise watershed committee exists, but becomes defunct, as is the case with Laxmamma watershed.
- Crop productivity enhancement and water use efficiency measures were not emphasized in the project to harness the full benefits of project activities, and increased water availability.
- Technology Resource organizations like academic/research institutions involvement was absent.
- As admitted by farmers in the village, availability of drinking water round the year, supplemental irrigation water for second crop and ground water increase helping growth of orchard crops are the visible qualitative and quantitative impacts due to watershed development.

Success story

- **Mr. B Ramulu** is one of the beneficiaries of check dam and owns 2 ha land near to it. Before construction of check dam water availability in bore well was less. After construction ground water availability has increased and he has planted sweet lime in his 0.8 ha land and earning about Rs. 1 lakh per annum from the orchard (Fig. 4).

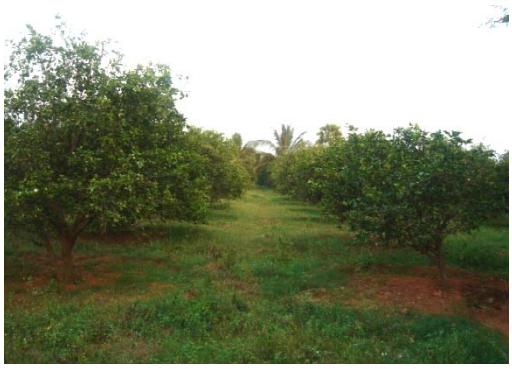


Fig:. B.Ramulu's sweet lime orchard fetching good profit

Impact Assessment Report

(12)Neelibanda Watershed, DPAP – I batch,

Nakrekal Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Nellibanda
iii. Names of villages in the Watershed:	Nellibanda
iv. Villages/Mandal/District:	Nellibanda/ Nakrekal/ Nalgonda
v. Name and Address of PIA:	PROGRESS, Nakrekal
vi. Total area of the watershed: (Treated area) ha	500 ha

2. Ownership pattern of land:

i. Arable land (ha)	
ii. Non-arable land (ha)	
iii. Government/ Community land (ha)	
iv. Private land (ha)	
v. Treated arable (ha)	
vi. Treated non-arable (ha)	

3. Verification financial and other Records

i. Total cost:		Spent: 8.60 lac
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes- PTs -6 No, CD's :4 No, FP-4No, RFD'S: 8 No Bunding: 4ha, Horticulture:2ha, Aforestation: 1ha	
iv. Whether watershed committees (WC) exits	No-W.President:Y.AnanthaReddy, WChairman:Laxmi Narasimha, Secretary: Ram Murthy	
v. If exists, activities of the committees	No activity	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

Water tank for drinking water purpose at the cost of 45100/-was constructed as entry point activity (EPA)

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	Satisfactory during project time, UGs-5no, SHG's -6no increased to 14no, WC, WA function during project period
ii. Records of meetings properly updated	Yes
iii. Liaison with scientific institutions established	No- Productivity enhancement training or linkage

iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes: ₹30000/- was collected and deposited in NGB- Nakrekal	
v. Self Help Groups	SHGs – increased from 6 to 14 no	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Purchase of milch animals, loans for agriculture inputs and opening shops.	
Bank linkages established:	Established bank case with NGB Nakrekal	
vi. Planned CPRs sustainable & equitable development	1 ha is planted with forest species like pongamia, sisu, bamboo and Rita etc	
vii. Benefits to weaker sections (women, dalits and landless)	Labor works in construction and plantation activity, dairy and micro enterprise and SHG's activity-	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	1-1.25 water levels increased and availability increased for irrigation of crops for additional area. Rejuvenated 20 old wells and new 45 bore wells come up for irrigation of crops.
ii. Additional area under cultivation/horticulture/affore station	50ha area brought under double cropping and horticulture in 1ha. 1ha forest plants plantation. Additional area for cropping 50 ha wit single cropping
iii. Changes in cropping pattern and intensity	Mary, Chilies, Cowpea/ green gram, pigeon pea cultivated after walnut
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	30-35	45-50
Cotton	8-10	16-17
Green gram/cowpea/PP	4-6	6-8

v. Changes in fodder & fuel wood availability	Increased crop production Improved fodder availability
vi. Changes in size and character of livestock holdings	50 animals increased 75 liters of milk production increased
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	Employment increased due to increased cropping with irrigation, double cropping generated more work
ix. Change in household category, total, & source-	Household income increased 40% level due to additional cropping with irrigation support, Dairy activity, Horticulture activity
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Good credit linkage with NGB, Nakrekal, Dependency on money lender reduced to 80% only 20% still dependence is left.
xi. Reduction in out-migration (case studies)	Migration reduced due to increased agriculture development horticulture and dairy work labor requirement increased, NREG's works now
xii. Reduction in drought vulnerability of the watershed	Decreased to 40% with all project activity and improved water availability for crops and horticulture Support of NREGA

xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
  - Repair of structures – cleaning of bushes etc and structure
  - Desilting of CD's and PT's will increase ground water recharge
  - Repair of LBS, and GC structures for proper functioning
  - Irrigation system need to be provided for crops and plantations
  - Guidelines for usage of WDF and NREG's works also for repair of structure

Comments of evaluator

- CD's and PT's are very good and need more area for bunding for moisture conservation
- Sweet lime plantations giving good benefits, needs more attention for disease and pests problems
- SHG's micro finance activity is satisfactory and financial support for agric activity is very good
- Irrigation area increased and dead wells rejuvenated and new bore wells dugged for irrigation
- NREG's activities to be integrated for desilting, repair and maintain of structure
- Distilling once in 2 year to maintain proper water percolation for ground water recharge

Success stories

Mr.Chennaiah: Improved cultivation of paddy and cotton with increased water availability with rejuvenated open wells after CD and PT constructed near by his field. His income increased to 200% compared to his earlier income. He is self sufficient and no loans and very happy with water shed intervention

Ms.Laxmamma: Improved milk production after purchasing 2 new milch animals in addition to her income made her family lead a happy life with sufficient income with watershed intervention.

Impact Assessment Report

(13)Pahilvanpur Watershed, DPAP – I batch,

Valigonda Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Pahilvanpur
iii. Names of villages in the Watershed:	Pahilvanpur
iv. Villages/Mandal/District:	Pahilvanpur / Valigonda /Nalgonda
v. Name and Address of PIA:	NEED- VALIGONDA
vi. Total area of the watershed: (Treated area) ha	-

2. Ownership pattern of land:

i. Arable land (ha)	-
ii. Non-arable land (ha)	-
iii. Government/ Community land (ha)	-
iv. Private land (ha)	-
v. Treated arable (ha)	-
vi. Treated non-arable (ha)	-

3. Verification financial and other Records

i. Total cost:		Spent: 2.60 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes, Bunding - 31ha, afforestation – 5 ha, horticulture – 1ha	
iv. Whether watershed committees (WC) exits	No – **W.President:** V Pandaru, W.**Chairman:** R Satyanarayan,a **W.Secretary:** Narasimha	
v. If exists, activities of the committees	No activity	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

No entry point activity- not active

5. Qualitative Parameters of Impacts

Functioning of village level institutions	UG's, SHG's, WC, WA for watershed activity formed and except SHG's no other committee active.
i. Records of meetings properly updated	Yes

ii. Liaison with scientific institutions established	No	
iii. Watershed Development Fund (WDF) collected?, and its utilization	Yes, RS 20,000/- with SBI Redlarpally Branch, not utilized	
iv. Self Help Groups	12 SHG's formed presently 20 SHGs are active	Revolving fund:
V.O functioning:	Good	Savings:
Utilization of loans:	Loans were utilized for buying milch animals and kirana shop	
Bank linkages established:	Linkage established with SBI Redlarpally	
v. Planned CPRs sustainable & equitable development	5 ha afforestation – plantation of Pongamia, Neem ,Teak, Sisu trees	
vi. Benefits to weaker sections (women, dalits and landless)	labor work in bunding and horticulture, Afforestation activity SHG's activity	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Not much water level increased
ii. Additional area under cultivation/horticulture/afforestation	Nil, only 1 ha horticulture, 5 ha afforestation
iii. Changes in cropping pattern and intensity	Cotton, Pigeon pea, paddy are increased in field bunding areas
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Cotton	8-10	15-16 ha
Pigenpea	4-6	8-10 ha
Paddy	30-35	35-40 q/ha

v. Changes in fodder & fuel wood availability	No change
vi. Changes in size and character of livestock holdings	Increased due to number of milk animals increased. Daily 80 liters milk added
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	Employment generated only through bunding works horticulture and afforestation – 350 man days
ix. Change in household category, total, & source-	20% house hold changed to improve their income by agriculture and dairy activity
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Reduced to 80% most of them is taking loan from SHGs linked to SBI bank
xi. Reduction in out-migration (case studies)	Reduced to 20%
xii. Reduction in drought vulnerability of the watershed	20% reduced

xiii. Detailed case studies of specific farmers impacted by the project	Mr. Narasimha purchased 2 buffalo through SHG's fund and with milk production his family income increased in addition to agriculture and he is very happy.
xiv. Photographs showing work + its impact	-

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Needs treatment of drains with CDs for improving ground water recharge
- Small drains with LBS and RFDs for improving the groundwater needs repair for improving the ground water recharge
- Bunding of more areas required, CD's, PT's works are not done need to be taken up.

Comments of evaluator

- Dairy activity is good and increased income to some family
- Horticulture needs attention more area need to be covered
- Bunding of damaged fields is needed and needs more area bunding
- No entry point activity and not much activity done in watershed treatment
- Committee was not active and unable to take up activity properly
- Improving the agriculture cultivation with support of irrigation is necessary

Fig: plantation of citrus plants given good income to farmers

Impact Assessment Report
(14)Palem-I Watershed, DPAP – I batch,

Nakrekal Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Palem-I
iii. Names of villages in the Watershed:	Palem
iv. Villages/Mandal/District:	Palem/Nakrekal/Nalgonda
v. Name and Address of PIA:	PROGRESS, Nakrekal
vi. Total area of the watershed: (Treated area) ha	458 ha

2. Ownership pattern of land:

i. Arable land (ha)	443 ha
ii. Non-arable land (ha)	15 ha
iii. Government/ Community land (ha)	13 ha
iv. Private land (ha)	2 ha
v. Treated arable (ha)	430 ha
vi. Treated non-arable (ha)	15 ha

3. Verification financial and other Records

i. Total cost:		Spent: 16.56 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes, CD -6, PT 10, LBS 10,3 farmponds ,308 ha bunding	
iv. Whether watershed committees (WC) exits	Active during project time, 10 members watershed committee 3 women, 3 SC /ST included	
v. If exists, activities of the committees	.Ws president –N Papulu, WS Secretary – N Venkanna, WS chairman – PK Krishnami- Informally functioning available for consultation during visits	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

Very active and 118 UG's formed during project work for doing all works
As an entry point activity drinking water facility, pipelines laying spent money around 65,000/- besides EPA construction of 6 CDs, 10 PTs and 10 LBS, 3 farm ponds, 308 ha area was bunded for moisture conversion

5. Qualitative Parameters of Impacts

viii. Functioning of village level institutions	Satisfactory during project period , now SHGs increased from 18-30 without any support from watershed scheme established

ix. Records of meetings properly updated	Yes	
x. Liaison with scientific institutions established	No farmers were given exposure to productivity enhancement	
xi. Watershed Development Fund (WDF) collected?, and its utilization	Yes collected 68,000/- according to given guidelines and deposited in NGB, Nakrakal, no clear guidance for spending the WDF fund	
xii. Self Help Groups	SHGs increased from 18-30 without any support	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Purchase of milk animals, agric inputs, small shops	
Bank linkages established:	Yes Nakrekal, NGM bank for loans and other transitions	
xiii. Planned CPRs sustainable & equitable development	2 ha is planted with pongamia, teak, bamboo and sitapal trees Teak plants 3 ha area planted	
xiv. Benefits to weaker sections (women, dalits and landless)	Engaged in labor wages during watershed works –generated employment regularly, SHG's micro finance and micro enterprise activity, dairy activity	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	There was an increase of 1.5-2 m water level and increased availability of water in times of duration 30 dead wells improved and 100 new bore wells come up for irrigation of crops
ii. Additional area under cultivation/horticulture/affore station	50 ha acre brought under agriculture and horticulture. Area under double crop increased, Paddy cultivation area increased 6ha horticulture with Sweet orange cultivation
iii. Changes in cropping pattern and intensity	Maize, Chilies, Chickpea/Green gram
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	35	45
Cotton	6-8	15-16
Green gram/ppea	3-4	4-6

v. Changes in fodder & fuel wood availability	Fodder availability increased, feed through paddy & Maize straw
vi. Changes in size and character of livestock holdings	200 Milk animals increased and increase in milk production 250 liter/day
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	Employment increased due to increased cropping with immigration, double cropping horticulture
ix. Change in household category, total, & source-	House hold income increased to 50% due to agriculture increase dairy, horticulture plantations and other livelihood activities
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Good linkage of SHGs with banks dependence on money lenders for finance reduced to 20%

xi. Reduction in out-migration (case studies)	Migration decreased and lot of employment generated in the village itself –Now NREGAs Scheme etc
xii. Reduction in drought vulnerability of the watershed	Decrease by 50%, Reduced to 60% with improved water availability to grow double crops, dairy, horticulture, SHG,s with all the activity and NREGAs works
xiii. Detailed case studies of specific farmers impacted by the project	Mr.Narayana's horticulture production (sweet lime) of 2 ha has increased the income of beneficiary by 200%.
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Urgent need for removal of silt from check dams for effective functioning for groundwater recharge.
- Urgent Repair of damaged structures PT's
- Loose builder /Gully control structure stone's displacement need to be repaired
- Guidelines for usage of WDF

Comments of evaluator

- Almost all the area is bunded and field outlets need to be provided with LBS. Paddy area increased and production is improved and double cropped area is increased and benefited many farmers with increased water availability.
- CDs are better functional with repair of body wall leakage and silt removal.
- Road side avenue plantation work 2.5km is good but 40% survival need to be planted missing plants
- Farm ponds are useful for water availability need stone pitching of walls and desilting
- Teak plantation is very good survival by 90%
- Dairy activity is improved a lot with additional milch animals with lot of milk additional milk production

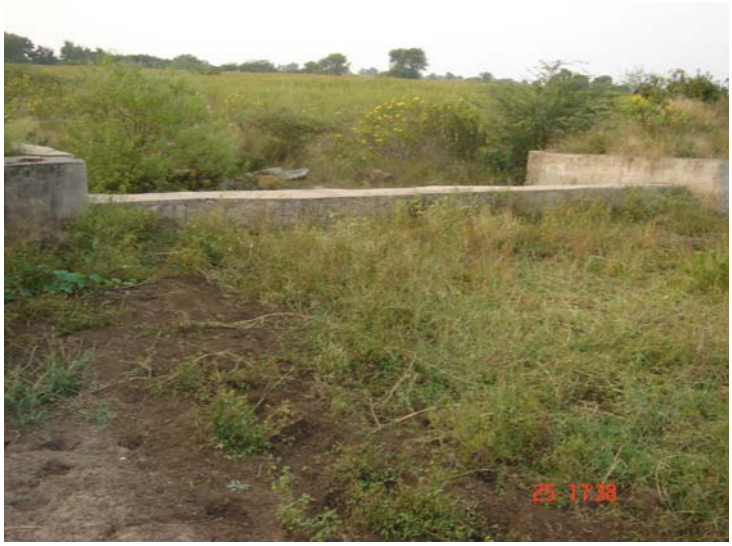


Fig: Check dam silted up need to be cleared for proper functioning.

Impact Assessment Report
(15)Peddathanda Watershed, DPAP – I batch,

Devarakonda Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Pedda Thanda
iii. Names of villages in the Watershed:	Serepalli
iv. Villages/Mandal/District:	Serepalli/Devarakoonda/Nalgonda
v. Name and Address of PIA:	DASM, KM-Palli
vi. Total area of the watershed: (Treated area) ha	

2. Ownership pattern of land:

i. Arable land (ha)	
ii. Non-arable land (ha)	
iii. Government/ Community land (ha)	
iv. Private land (ha)	
v. Treated arable (ha)	
vi. Treated non-arable (ha)	

3. Verification financial and other Records

i. Total cost:		Spent: 19.99 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes: LBS-96, CD-17, RFD-40, FP-5, PT-10, Bunding 51ha, afforestration-20 ha, harvesting-2ha	
iv. Whether watershed committees (WC) exits	Best during project occasionally meet as and when necessary W.President-R Haliya, W.Chairman- R. Ramkoti W.Secretary-R. Venkat	
v. If exists, activities of the committees	Not functioning	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries) very active

EPA: bore well. Rs: 30,000/- spent in addition the following structures were done with participation of community- LBS-96, CD-17, RFD-40, FP-5, PT-10, Bunding 51ha, afforestration-20 ha, Horticulture--2ha

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	Very good during project provided, WA, WC, UG's-9, SHG's-9 increased to 20 on their own
ii. Records of meetings properly updated	Yes, regularly done by secretary
iii. Liaison with scientific institutions established	Not done

iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes, Rs 73,000 collected and deposited with NGB. KM Pally	
v. Self Help Groups	SHG's increased from 9-20 groups	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	For milch animals, sheep's, agricultural, inputs etc.	
Bank linkages established:	Established with NGB-KM pally	
vi. Planned CPRs sustainable & equitable development	20 ha planted with plants of forest species-teak, pongamia, sitapal, bamboo, sisu etc needs gap filling- 60% survival	
vii. Benefits to weaker sections (women, dalits and landless)	Only through wages through construction activity during project. SHG microfinance activity	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Water level increased 1-2 m and 10 wells rejuvenated and 30 new bore wells dug for additional area and double cropping
ii. Additional area under cultivation/horticulture/afforestation	65 ha brought under cultivation bore wells and old wells recharged. Single cropping to double cropping
iii. Changes in cropping pattern and intensity	Yes, more paddy area and cropping with irrigation, cotton maize chilly pigeon pea etc
iv. Changes in agricultural productivity	
v. Changes in fodder & fuel wood availability	Fodder availability due to higher crop production
vi. Changes in size and character of livestock holdings	Increased additional 60 milch animal, additional milk production of 90 liter per day increased
vii. Status of grazing land & their carrying capacity	Developed only with plantation of forest species trees
viii. Employment generated due to implementation of project	Generated 23700 man days for village people and reduced migration due to various agriculture, horticulture dairy works
ix. Change in household category, total, & source-	Lower income and Medium income farmers were increased 50% of their family income due to agriculture, Dairy and horticulture activity. Micro enterprise and SHG's activity helped to improve financially
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	No body is depended on private money lenders. All are depending on banks and SHG's
xi. Reduction in out-migration (case studies)	60-70% of migration reduced due to employment in the village , Dairy, Horticulture, NREGA activity supported
xii. Reduction in drought vulnerability of the watershed	50-60% reduced due to improved water availability for agriculture, Horticulture, dairy and also microfinance and micro enterprise support.
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

Crops	Yield (q/ha)	
	Before	After
Paddy	35-40	45-50
Cotton	8-10	15-16
Cay/Maize	5-6	8-10

Learning's and process documentation (how the program could be implemented better; constraints, improvements possible, Changes made etc.) Farmer's participation is very good and needs additional support in improved crop management and irrigation use

- Repair work required for PT's, CD's, RFD's, LBS and clearing shrubs around structure.
- Desilting of PT's and CD's for improving the ground water recharge and application silt to crops for improving the fertility of land.
- Guidelines to use WDF fund and NREGA work for repair of structures to be integrated.
- Horticulture plantation needs further attention with drip and sprinkler irrigation system.

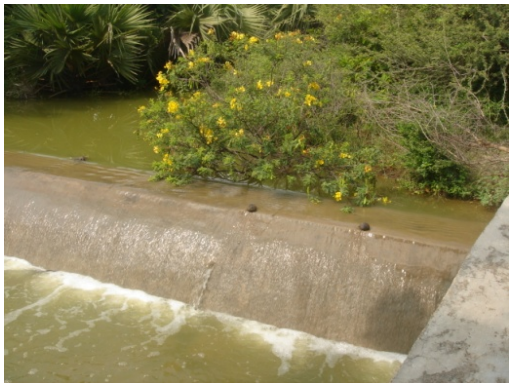
Comments of evaluator

- CD's and PT's works are very good for ground water recharge and 1-1.5m water level increased and sufficient water available more than 65 ha area additionally brought under cultivation of 2 season crops
- Crop yields and area increased due to additional water availability
- Dairy activities are satisfactory increased no of milch animals and milk production
- Afforest ration is good 60% plants survived and gaps need to be planted
- SHG's done excelled work with microfinance and micro enterprise activity and developed bank linkage to support farmer's needs of agric inputs.

Case studies

Mrs. Padma purchased a buffalo with watershed revolving fund and benefited with milk production to support her family with additional income. Basically depend on labor work in field and this additional income helped her in supporting her family.

Mr Ramaiah has 2 ha land and growing 2 crops of paddy and cotton with irrigation cultivation area increased due to increased water availability in his bore well. Due to percolation tank constructed near his field the water level in bore well increased and helped him to grow more area with irrigation and doubled his income cultivation.



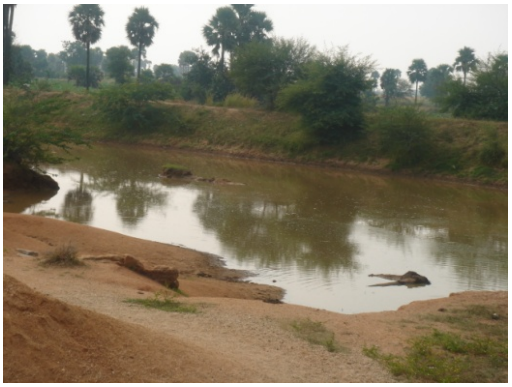


Fig Check dam and Percolation tank improved ground water level of wells and bore wells of farmers around the area but not so effective needs removal of silt clearing bushes around.

Impact Assessment Report

(16)Peddasuraram II Watershed, DPAP – I batch,

Thipparthy Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Peddasuraram –II
iii. Names of villages in the Watershed:	Suraram
iv. Villages/Mandal/District:	Suraram/Thipparthy / Nalgonda
v. Name and Address of PIA:	MPDO Thipparthy
vi. Total area of the watershed: (Treated area) ha	589 ha -320 ha

2. Ownership pattern of land:

i. Arable land (ha)	409 ha-trended-301
ii. Non-arable land (ha)	180 ha
iii. Government/ Community land (ha)	18 ha
iv. Private land (ha)	162 ha
v. Treated arable (ha)	301 ha
vi. Treated non-arable (ha)	19 ha

3. Verification financial and other Records

i. Total cost:	20 lakhs	Spent: 17.96 lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes, Bunding-177 ha, horticulture -7 ha, Afforestation -8.75ha, CD- 3, LBs 90, PT- 10 RFD -7	
iv. Whether watershed committees (WC) exits	Formally exists	
v. If exists, activities of the committees	occasionally meeting as and when necessity arises	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

With a cost of Rs80,000 compound wall for school was built as an entry point activity. Bunding 166 ha, 8.75 ha Afforestation, 7 ha horticulture, PT -2, CD -3, LBS -90, PT 10, RFD - 7

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	SHG only active and no increased from 9-15 order , UG- 8	
ii. Records of meetings properly updated	Yes	
iii. Liaison with scientific institutions established	Nil, No exposure visit for productivity enhancement	
iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes Collected RS 76,000/- IOB Nalgonda Not utilized no guidelines	
v. Self Help Groups	9- SHG's increased to 15	Revolving fund:
V.O functioning:	SHG only active	Savings:
Utilization of loans:	Purchase of buffalo, sheep's, shops and agric inputs etc	
Bank linkages established:	Yes with IOB, Nalgonda Bank	
vi. Planned CPRs sustainable & equitable development	Plantation of 8.75 ha in CPR forest species out of 18 ha government land	
vii. Benefits to weaker sections (women, dalits and landless)	No specific only labor work during watershed works and SHG;s micro-finance support and micro enterprise activity	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Improvement was clearly seen in improvement of agriculture Rejuvenating 30 old wells with increased level up to 1.5m Increased area for irrigation due to more water available New Bore wells -50
ii. Additional area under cultivation/horticulture/affore station	60 ha from single crop to double cropping, 20ha Horticulture was added for cultivation.
iii. Changes in cropping pattern and intensity	Improved cultivation of paddy, cotton, green gram, chickpea, Pigeon pea was increased
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	35	45-50
Cotton	8-10	15-16
Green gram/ Pigenpea	5-6	8-10

v. Changes in fodder & fuel wood availability	Not much change – improved crop production, Increased fodder availability
vi. Changes in size and character of livestock holdings	No of new milk animals added was 60 and 80 liters milk production increased daily
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	About 150 families benefited as labor work in the project implementation as additional area of cultivation increased employment opportunities total 24000 man days generated

ix. Change in household category, total, & source-	Improved income up to 60% with increased crop yield and milk production
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Reduced up to 80% and present SHG's with Bank linkage has helped them utilizing for agriculture inputs and Dairy activity with less interest
xi. Reduction in out-migration (case studies)	70% decreased due to increased employment availability in villages for agriculture and horticulture activities
xii. Reduction in drought vulnerability of the watershed	40-45% is reduced due to additional income through irrigation water availability in wells and bore wells for cultivation, horticulture and dairy activity
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Urgent need for repair of Structures mainly CD, PT and LBS and RFD's
- Desilting of CD's and PT's and cleaning bush around the structure for improving ground water recharge and also desilting of fodder channels is also essential.
- Guidance for using WDF and also for NREGA activities for repair works of structure and bunding for remaining area

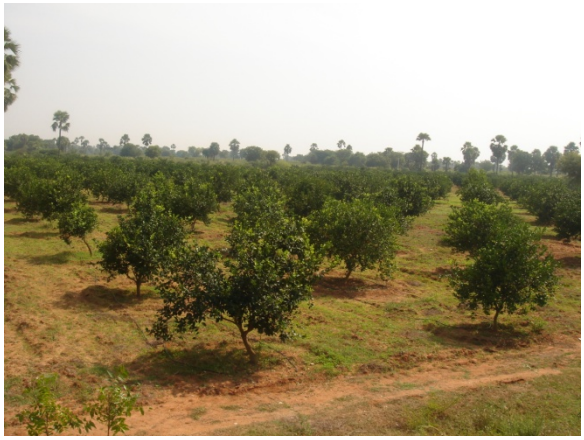
Comments of evaluator

- Many of the water harvesting structures need to be repaired
- Ground water availability increased agriculture crop production and also horticulture plantation of sweet lime got good benefit to farmers.
- Availability of drinking water is sufficient and available through out the year
- Need agriculture productivity enhancement activity with improved varieties cultivation
- More efficient irrigation system like drip and sprinkler to be introduced
- Dairy activity helped farmer to improve their income in addition to agriculture.

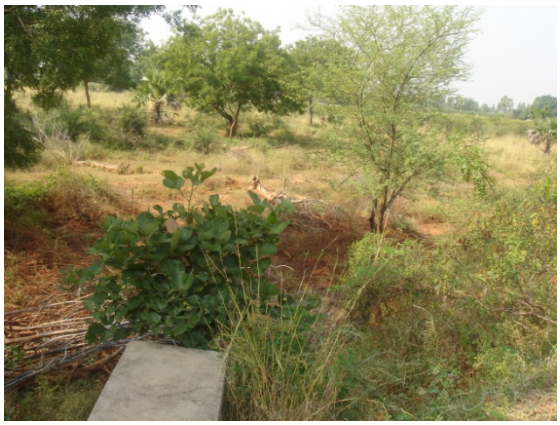
Success Story

Mr. Krishna Reddy one of the farmer benefited person with a percolation tank constructed near his field area. He has one bore well with improved water availability in 1.4 ha land and growing two irrigated crops in a year. His income increased 2-3 times as compared to earlier cultivation. He is very happy and benefited due to watershed interventions.

Mr. Ananthaiah planted 2 ha horticulture plants (Sweet lime) and got very good fruit production fetched him good money and his family income increased 3 times as compared to earlier and he is benefited a lot due to watershed activity for improving



Good plantation of sweet lime giving higher income to farmers



Repair, cleaning and desilting is required for this check dam

Impact Assessment report

(17)Pragathi Watershed, DPAP – I batch,

Nampally Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Pragathi
iii. Names of villages in the Watershed:	Pasnoor
iv. Villages/Mandal/District:	Pasnoor/ Nampally/ Nalgonda
v. Name and Address of PIA:	Gramini Rural Development Society, K M Pally
vi. Total area of the watershed:	544 ha (500 ha Treated area)

2. Ownership pattern of land:

i. Arable land (ha)	471
ii. Non-arable land (ha)	73
iii. Government/ Community land (ha)	44
iv. Private land (ha)	29
v. Treated arable (ha)	471
vi. Treated non-arable (ha)	29

3. Verification financial and other Records

i. Total cost:	Approved: Rs 20 Lakh ?	Spent: Rs 21.42 Lakh ?
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes PT (7), Dugout/ sunken ponds (4 Nos.), CD (2), Bunding (167 ha), horticulture (58 ha), afforestation (11 ha)	
iv. Whether watershed committees (WC) exits	Yes WC comprises of 11 members (2 women, 9 men); Mr P Goverdhan Reddy was WA President, Mr G Ramulu, was WC Chairman, Mr. R Anjaiah was WC Secretary. All these members were available for consultation.	
v. If exists, activities of the committees	Not functional due to any clear guidelines for utilizing WDF to repair and maintain structures.	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

A bore well with pump set at ZPHS premises was taken up as an entry point activity for drinking water supply to the villagers at the cost or Rs. 39,000/-; Besides EPA, construction of 2 check dam, 7 percolation tanks, 4 Dugout ponds and other conservation works were taken up with the participation of farmers from 12 user groups (UGs) and landless poor from the watershed village.

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	Satisfactory during project and after as the SHGs increased from six to forty eight without any financial help from watershed scheme.	
ii. Records of meetings properly updated	Yes	
iii. Liaison with scientific institutions established	No, farmers were not given any exposure to productivity enhancement	
iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes; collected Rs.88 000 according to guidelines and deposited in Nagarjuna Gramina Bank, Nampally but unspent for maintenance works due to lack of clear guidelines on use from District Authorities.	
v. Self Help Groups	SHGs increased from 6 to 48 after watershed interventions (no support from watershed program	Revolving fund: Rs. 50 000
V.O functioning:		Savings: 3 00 000
Utilization of loans:	Loans were given to the members for purchase of buffaloes, sheep, inputs for agriculture, sieving machines, and for establishing tailoring shops	
Bank linkages established:	Farmers have linkage with Gramina Bank at Nampally and Mallepally for credit and other transactions	
vi. Planned CPRs sustainable & equitable development	Nil	
vii. Benefits to weaker sections (women, dalits and landless)	No specific initiatives; engaged for labor work during watershed works.	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	Impact of watershed project has clearly reflected in enhancing the groundwater levels (2 m increase) and duration of water availability in wells (doubled) for agricultural and other purposes in the watershed. More number of bore wells was dug after watershed interventions. About 12 wells, which were totally dead, were rejuvenated. Area under irrigation has been increased.
ii. Additional area under cultivation/horticulture/afforestation	101 ha additional area brought under cultivation; 58 ha private land with horticulture; 11 ha common land with afforestation.
iii. Changes in cropping pattern and intensity	Before project sorghum, millets, pigeon pea and paddy crops were grown; After watershed implementation, farmers shifted to horticulture plantations like sweet lime and acid lime along with other annual crops such as groundnut, cotton, paddy and pigeon pea.
iv. Changes in agricultural productivity	
v. Changes in fodder & fuel wood availability	Increased water availability has improved fodder availability. Improved forage grasses and *Stylo* are being grown.
vi. Changes in size and character of livestock holdings	Number of milch cattle increased by 42 numbers and milk production increased by 35 liters a day.
vii. Status of grazing land & their carrying capacity	No change

Crops	Yield (q/ha)	
	Before	After
Cotton	10-12	18
Groundnut	15	20
Paddy	40	60

viii. Employment generated due to implementation of project	About 120 laborers had employment during project period; on implementation of project water availability enhanced additional cropping area and productivity.
ix. Change in household category, total, & source-	Around 230 households improved their income through agriculture, dairying and livelihood activities.
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Have good credit linkages with banks, micro finance of SHGs also helping and less dependence on private moneylenders.
xi. Reduction in out-migration (case studies)	15% decreased during watershed project implementation and no migration now due to NRGES.
xii. Reduction in drought vulnerability of the watershed	Quantity and duration of groundwater availability has increased and about 50% benefit due to watershed interventions.
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

7. **Learnings and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)

- Repair, maintenance and de-silting of water harvesting structures are essential to get sustainable benefits.
- Recharging of dry open wells near small streams would have given better equity and results.
- De-silting and deepening of village tanks and percolation tanks can improve water harvesting.
- Mechanization of agriculture required for overcoming the labor problems.
- Guidelines are needed for using WDF.

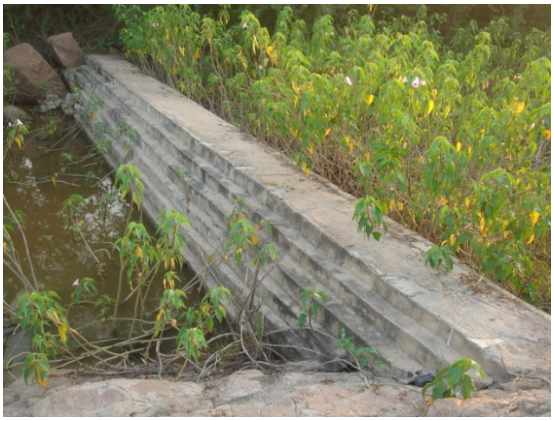


Figure 1. Masonry check dam at Pragathi watershed,

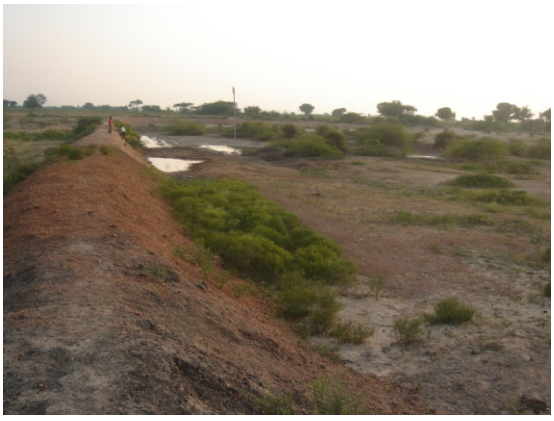


Figure 2. Percolation tank, Pragathi watershed.

Comments of evaluator

- Some of the WHS are constructed in uncultivated area and there are no direct beneficiaries near these structures. Quality of construction and location of the structures is not satisfactory **(Fig. 1 & 2).**
- Water harvesting structures are filled with sediment, bushes and developed leakages resulting in reduced water storage hence the effectiveness of the watershed structures reduced **(Fig.3)**.

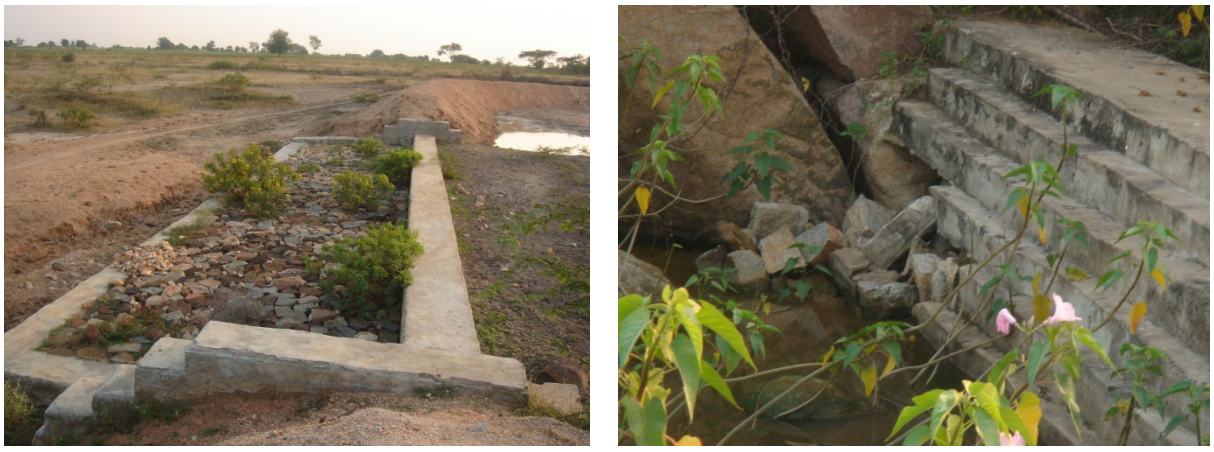


Figure 3. PT filled with sediment (left) and CD developed leakages (right), Pragathi watershed

- Post-project maintenance was not clearly envisaged as an exit policy in the project, hence proper mechanism should be operationalized to repair and maintain the structures, and to ensure proper utilization of WDF/community contribution, clear guidelines should be in place. Otherwise watershed committee exists, but becomes defunct, as is the case with Pragathi watershed.
- Crop productivity enhancement and water use efficiency measures were not emphasized in the project to harness the full benefits of project activities, and increased water availability.
- Technology Resource organizations like academic/research institutions involvement was absent.
- As admitted by farmers in the village, availability of drinking water round the year, supplemental irrigation water for second crop and ground water increase helping growth of orchard crops are the visible qualitative and quantitative impacts due to watershed development.

Success story

- **Mr. R Venkulu** is one of the beneficiaries of horticulture plantation. He has planted sweet lime in his 1.2 ha land along with 10 coconut plants, which were supplied in watershed activities is happy with the plantation as he is getting good income with less investments (Fig. 4).

- **Mr. Goverdhan Reddy** owns 8 ha land near a percolation tank, and one of the beneficiaries of this PT satisfactorily admits that groundwater level has been increased in the tube well by about 25% due to PT construction and income has been doubled due to watershed interventions.

Fig.. Sweet lime orchard of Mr. R Venkulu gave him good benefits

Impact Assessment Report
(18)Sherepally Watershed, DPAP – I batch,

Devarakonda Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Sherepally
iii. Names of villages in the Watershed:	Sherepally
iv. Villages/Mandal/District:	Sherepally/Devarakonda/Nalgonda
v. Name and Address of PIA:	DASM KMPALLY
vi. Total area of the watershed: (Treated area) ha	

2. Ownership pattern of land:

i. Arable land (ha)	
ii. Non-arable land (ha)	
iii. Government/ Community land (ha)	
iv. Private land (ha)	
v. Treated arable (ha)	
vi. Treated non-arable (ha)	

3. Verification financial and other Records

i. Total cost:		Spent: 22.15 Lakhs
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes- 117 ha bunding, 27 ha afforestation, 2 ha horticulture, LBS-70, PT's-8, Sunkenpits-10, CD's -4, RFD's- 40, FP-5 no,	
iv. Whether watershed committees (WC) exits	Not functioning W. President- Mr. K.LaxmaReddy, W.Chairman-Mr. R.Kotaih, W.Secretary-Mr.J.Goverdhan Reddy	
v. If exists, activities of the committees	no activity	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

EPA -Internal roads of village Rs 30,000/- spent for this work

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	.UG's-9, SHG's 9 and WC of 14 members , WA-Village SHG's are active and functioning
ii. Records of meetings properly updated	Yes
iii. Liaison with scientific institutions established	No
iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes collected and deposited Rs72,000/- with NGB K MALLEPALLY

v. Self Help Groups	SHG's were active independently	Revolving fund:
V.O functioning:	9 Groups and increased 20 groups	Savings:
Utilization of loans:	For production of milch animals, shops, Tailoring etc…	
Bank linkages established:	Established with NGB KMpally	
vi. Planned CPRs sustainable & equitable development	27 ha common land planted with forest species plants of teak, pongamia, sisu, bamboo	
vii. Benefits to weaker sections (women, dalits and landless)	Lab our work in all construction and plantation activity-SHG's activity	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	1.5-2 m ground water level increased. Sufficient drinking water no problem. Irrigation area increased. 5 old wells rejuvenated and 80 new bore wells have come up in treated area.
ii. Additional area under cultivation/horticulture/affore station	Total of 86ha area is brought under additional cultivation of crop with irrigation for 2 seasons. Afforestation 27ha and 2 ha horticulture area also increased.
iii. Changes in cropping pattern and intensity	Paddy area increased, Cotton, Cow pea, Maize, sweet orange
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Paddy	30-35	45-50
Cotton	8-10	15-16
C. pea/P.Pea	5-6	8-10

v. Changes in fodder & fuel wood availability	Yes due to higher production of crops more fodder availability
vi. Changes in size and character of livestock holdings	Increased nearly 100 liter per day with addition of 40 milch animals
vii. Status of grazing land & their carrying capacity	No change only plantation is done
viii. Employment generated due to implementation of project	Employed generated to the extant of 26550 Man days
ix. Change in household category, total, & source-	95 families benefitted. 60-80% income increased, rest of the families 40-50% income increased
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Completely reduced most of them are going to banks and SHG's only 10% people are taking private loans
xi. Reduction in out-migration (case studies)	Reduced 60-80% due to additional work available through Agriculture, horticulture, dairy because of increased water availability in watershed area
xii. Reduction in drought vulnerability of the watershed	60% reduced due to increased availability of water irrigation
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- Repair required for damaged structure like PT's and CD'S and LBS
- Horticulture area expansion needs to be done for better returns
- Some more CD's are required for additional ground water recharge
- PT's and CD'S are silted up removal of silt help in effective functioning
- Provide milk collection centre facility for increasing milk production
- WDF fund guidelines to be provided and also through NREGS for repair activity

Comments of evaluator

- Ground water recharge is very good due to CD'S and PT's construction
- Area increased for agriculture, horticulture with irrigation from wells and bore wells
- Improved variety of crop need to be integrated
- Dairy activity is very good with improved milk production
- Horticulture income is very high for farmers need to expanded

Success Story

Mr. R Krishnaih Because of his well recharged due to PT's and CD's near by his field improved ground water availability benefitted in increasing his income 2 times compared to what he is to get earlier. The family is very happy with increased income.

Ms Anjamma: Purchased 2 buffalo's with support from SHG's revolving fund has increased her income 200% and her family members are very with increased income

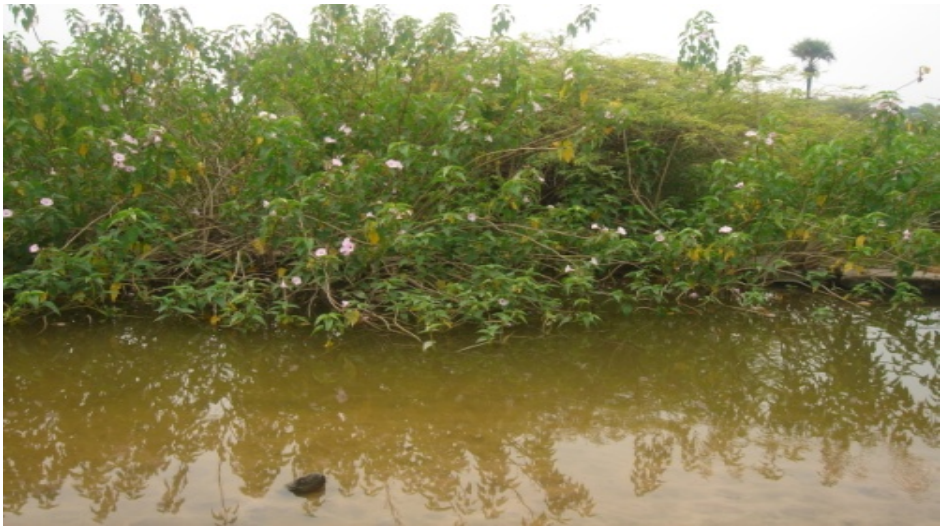


Fig: Check dam full of bushes around head wall needs cleaning

Impact Assessment Report
(19)Varuna Watershed, DPAP – I batch,

Chityla Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Varuna
iii. Names of villages in the Watershed:	Vanipakala
iv. Villages/Mandal/District:	Vanipakala/Chityla/Nalgonda
v. Name and Address of PIA:	SISS, MUNUGODE
vi. Total area of the watershed: (Treated area) ha	500 ha

2. Ownership pattern of land:

i. Arable land (ha)	
ii. Non-arable land (ha)	
iii. Government/ Community land (ha)	
iv. Private land (ha)	
v. Treated arable (ha)	
vi. Treated non-arable (ha)	

3. Verification financial and other Records

i. Total cost:	23.52 lakhs	Spent: Rs 23.52
ii. Expenditure incurred as per guidelines	Yes	
iii. Works executed as per Records	Yes-PTs-10no,RFDs-71no,CD's- 8no, LBS -200	
iv. Whether watershed committees (WC) exits	During project period only W. President- S Yadaiah W. Chairman- M Narsaiah W. Secretary- M Yadaiah	
v. If exists, activities of the committees	.No activity except SHG's micro finance	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

EPA- Community hall with one lakh expenses

5. Qualitative Parameters of Impacts

i. Functioning of village level institutions	Satisfactory during project period WC, WA, UG's- 5, SHG's-10
ii. Records of meetings properly updated	Yes
iii. Liaison with scientific institutions established	Not done
iv. Watershed Development Fund (WDF) collected?, and its utilization	Yes collected Rs 25,000/- deposited in NGB Chityla

v. Self Help Groups	SHG's from 10 to 20 group on their own	Revolving fund:
V.O functioning:		Savings:
Utilization of loans:	Loans utilized for purchase of buffalo, sheep's, kirana shop, agric inputs, tailoring activity etc	
Bank linkages established:	Established with NGB Chityla For agriculture inputs loans and irrigation equipments.	
vi. Planned CPRs sustainable & equitable development	No -only tree plantation of teak, pongamia, bamboo, sisu etc in 6.5 ha area	
vii. Benefits to weaker sections (women, dalits and landless)	Only through labor, Employment generated, works of agriculture, horticulture and dairy activity, micro finance activity of SHG's.	

6. Quantitative Parameters of Impacts

i. Improvements in water table/water availability	1-1-5 m water level increased and 25 wells Rejuvenated and 120 new bore wells come up. Ground water availability increased no problem for drinking purpose and agriculture and horticulture for double cropping.
ii. Additional area under cultivation/horticulture/afforestation	130 acre of facilitated with irrigation for growing 2 season crop with wells and bore wells additionally. Horticulture -6 ha and afforistation-6.5 ha
iii. Changes in cropping pattern and intensity	Paddy area increased, Horticulture plantation Cotton ,pigeon pea cultivation increased
iv. Changes in agricultural productivity	

Crops	Yield (q/ha)	
	Before	After
Cotton	8-10	15-16
Paddy	30-35	40-45
C. Pea/P.Pea	5-6	8-10

v. Changes in fodder & fuel wood availability	Not much change only due to increased productivity, fodder availability is increased.
vi. Changes in size and character of livestock holdings	75 milch animals purchased and 110 liter of additional milk produced per day.
vii. Status of grazing land & their carrying capacity	No change
viii. Employment generated due to implementation of project	Most of the works done by labor and got employment. 31325 man days of employment generated during project period.
ix. Change in household category, total, & source-	Household category has changed to 60% families with Agriculture, dairy activity and horticulture incomes. Due to increased water availability the activities are done successfully.
x. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	No body depending on Money lenders. Everybody goes to banks or SHG s
xi. Reduction in out-migration (case studies)	Reduced to 65% employed within village.
xii. Reduction in drought vulnerability of the watershed	Reduced to 50% due to water availability and increased area of irrigation employment generated through Agriculture, horticulture and dairy activity
xiii. Detailed case studies of specific farmers impacted by the project	
xiv. Photographs showing work + its impact	

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- All CD's, PT's and LB's RFD's needs repair clearing of bushes shrubs around structure.
- Desilting of sediment in PT's and CD's for effective ground water recharge and application of silt to fields for improving fertility of land.
- NREGA's guidelines to be established for repair of structure and agriculture activity. WDF fund guide lines for taking up repair works of structures.

Comments of evaluator

- Good ground water level increased up to 1-1-5m
- More time availability of water for irrigation to crops and no problem for drinking water
- Horticulture plantation of sweet orange giving good profit to farmers.
- Dairy activity is very good with increased milk production
- Fodder plantation is very good
- Irrigated area increased for growing 2 season crops 60ha and one season crops in 70ha and totally 130 ha is irrigation facility.
- SHG's micro finance activity is doing good work and nobody taking money from money lenders and other sources.

Success Story

Mr.M.Yadaih: Agriculture production is increased due to improved ground water availability through bore well for irrigation due to construction of CD and PT. He is to irrigate one ha earlier now with improved water availability he is growing 2 season cop in 2.5 ha. His income increased to 200% due to this the living standard changed.

Mr. Narayana Reddy. Improved his field income 300% percent by planting sweet orange in 1 ha land and harvested fruits worth of 2 lakhs. He was very poor and life is changed drastically and income has increased. This change is due to watershed intervention.

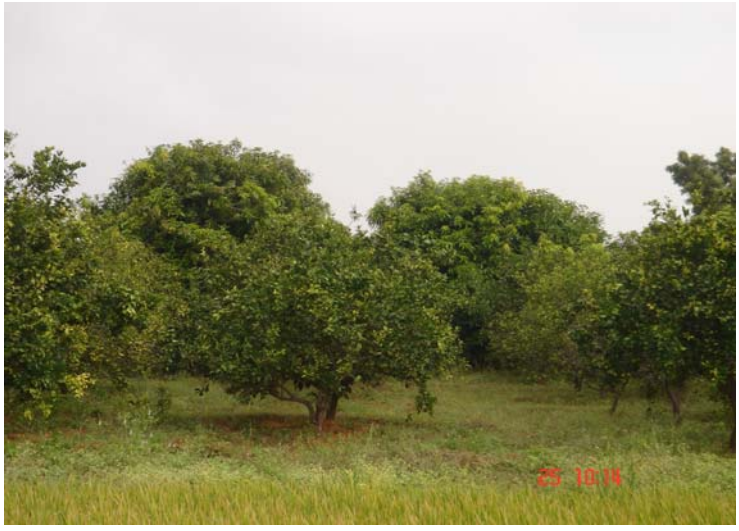


Fig: Citrus plantation of Narayana Reddy with support of well water recharged by watershed activity.

Impact Assessment Report
(20)Vankarai Watershed, DPAP – I batch,

Narayanpur Mandal, Nalgonda district, Andhra Pradesh

1. Details of watershed:

i. Name of the Scheme:	DPAP – I Batch
ii. Name of the watershed:	Vankarai
iii. Names of villages in the Watershed:	Mohummadabad
iv. Villages/Mandal/District:	Mohummadabad / Narayanpur /Nalgonda
v.Name and Address of PIA:	PEACE, Narayanpur
vi. Total area of the watershed: (Treated area) ha	538

2. Ownership pattern of land:

i. Arable land (ha)	200
ii. Non-arable land (ha)	338
iii. Government/ Community land (ha)	238
iv. Private land (ha)	100
v. Treated arable (ha)	438
vi. Treated non-arable (ha)	238

3. Verification financial and other Records

1. Total cost:		Spent: Rs 28.8 lakhs
2. Expenditure incurred as per guidelines	Yes	
3. Works executed as per Records	Yes-PTs-4no,RFDs-30no,CD's- 14no, LBS -140, FP,s=2no CCt,s=24.5km,Bunding=100ha, Afforestation=15ha,Hort=10ha	
4. Whether watershed committees (WC) exits	During project period only W. President- M.Anjireddy W. Chairman- M.Chndraih W. Secretary- Ms M.Sharada	
5. If exists, activities of the committees	.No activity except SHG's micro finance	

4. Community participation (how community participation have been ensured and what EPA have been taken up, inputs of details of beneficiaries)

EPA- Community hall with Rs 80,000 expenses

5. Qualitative Parameters of Impacts

1. Functioning of village level institutions	Satisfactory during project period WC, WA, UG's- 10, SHG's-12
2. Records of meetings properly updated	Yes
3. Liaison with scientific institutions established	Not done
4. Watershed Development Fund (WDF) collected?, and its utilization	Yes collected Rs 1,00,000/- deposited in SBI Choutuppal not utilized-no guidelines

5. Self Help Groups	SHG's from 12 to 20 group on their own	Revolving fund: 100% utilized
V.O functioning:		Savings:
Utilization of loans:	Loans utilized for purchase of buffalo, sheep's, kirana shop, agric inputs, tailoring activity etc	
Bank linkages established:	Established with SBI Choutuppal For agriculture inputs loans and irrigation equipments.	
6. Planned CPRs sustainable & equitable development	No -only tree plantation of pongamia, sisu and Amla in 15 ha ha area 3200 plants planted and 40% survived	
7. Benefits to weaker sections (women, dalits and landless)	Only through labor, Employment generated works of agriculture, horticulture and dairy activity, micro finance activity of SHG's.	

6.Quantitative Parameters of Impacts

a. Improvements in water table/water availability	1-1.25 m water level increased and 5 wells Rejuvenated and 10 new bore wells come up. Ground water availability increased no problem for drinking purpose and agriculture and horticulture for double cropping.
b. Additional area under cultivation/horticulture/Afforestation	50 acre of facilitated with irrigation for growing 2 season crop with wells and bore wells additionally. Horticulture -10 ha and afforistation-15 ha
c. Changes in cropping pattern and intensity	Paddy area increased, Horticulture plantation Cotton, pigeon pea cultivation increased. Citrus plantations increased
d. Changes in agricultural productivity	
e. Changes in fodder & fuel wood availability	Not much change only due to increased productivity, fodder availability is increased.
f. Changes in size and character of livestock holdings	50 milch animals purchased and 100 liter of additional milk produced per day increased.
g. Status of grazing land & their carrying capacity	10ha area developed with forage for open grazing increased
h. Employment generated due to implementation of project	Most of the works done by labor and got employment. 35600 man days of employment generated during project period.
i. Change in household category, total, & source-	Household category has changed to 50% families with Agriculture, dairy activity and horticulture incomes. Due to increased water availability the activities are done successfully.
j. Freedom from Debt and reduction in degree of dependence of money lenders (case studies)	Only 10% depending on Money lenders. Everybody goes to banks or SHG s
k. Reduction in out-migration (case studies)	Reduced to 55% employed within village.
l. . Reduction in drought vulnerability of the watershed	Withstand one crop season due to water availability and increased area of irrigation employment generated through Agriculture, horticulture and dairy activity
m. Detailed case studies of specific farmers impacted by the project	
n. Photographs showing work + its impact	

Crops	Yield (q/ha)	
	Before	After
Cotton	8-10	15-16
Paddy	30-35	40-45
C. Pea/P.Pea	5-6	8-10

- **Learning's and process documentation** (how the program could be implemented better; constraints, improvements possible, Changes made etc.)
- All CD's, PT's and LB's RFD's needs repair clearing of bushes shrubs around structure.
- Desilting of sediment in PT's and CD's for effective ground water recharge and application of silt to fields for improving fertility of land.
- NREGA's guidelines to be established for repair of structure and agriculture activity. WDF fund guide lines for taking up repair works of structures.

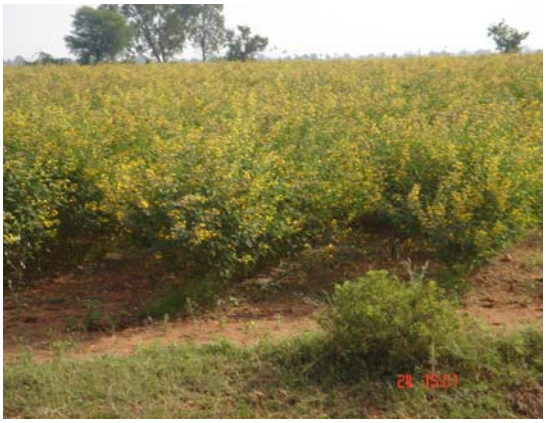
Comments of evaluator

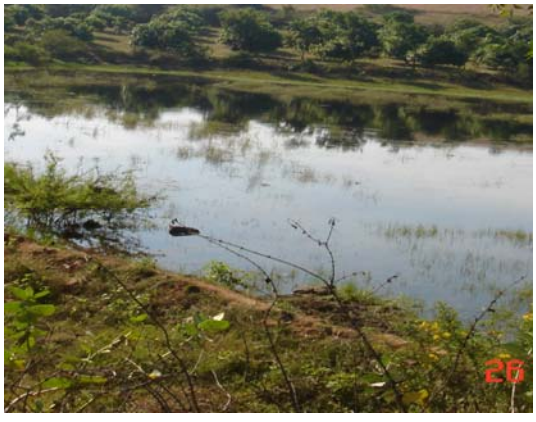
- Good ground water level increased up to 1-1.25m
- More time availability of water for irrigation to crops and no problem for drinking water
- Horticulture plantation of citrus giving good profit to farmers.
- Dairy activity is very good with increased milk production
- Fodder grass cultivation of 10ha is very good for grazing
- Irrigated area increased for growing 2 season crops 30ha and one season crops in 20ha and totally 50 ha is irrigation facility.
- SHG's micro finance activity is doing good work and nobody taking money from money lenders and other sources.

Success Story

Ms P.Bhagya: Milk production increased due to purchase of 1 buffalo's additionally and utilizing the pasture for grazing helped her to increase income by 100% due to watershed support..

Mr. Sathi Reddy. Improved his field income 250% percent by planting sweet orange in 2 ha land and harvested fruits worth of 3 lakhs. He was very poor and life is changed drastically and income has increased. This change is due to watershed intervention.





Fig; Good crop of pigeon pea grown with support of irrigation from tube well recharged from Percolation tank

ANALYSIS OF IMPACTS

Entry point Activity:

Entry point activity was taken up in 18 watersheds out of 20 watersheds assessed with an expenses ranging from 30 thousand to one lakh rupees. Basically the kind of works done were internal roads for villages , drinking water facilities like bore well, pump set with water tank and renovation of temple, compound wall of school, milk collection center and construction of community hall. This kind of activity was very good and all the community together participated and further helped to take up the watershed works with community participation actively.

Community (People's) Participation

One of the main objectives of DPAP was to ensure and enhance people participation in this programme. Watershed Association and watershed committees, users groups and self Help Groups (SHG's) were formed for operation of different activities watershed. In the initial stages of the project itself ensure participation of people and create awareness. An amount of Rs. 49 lakhs were provided for training and community organization. Once the project was implemented by DWMA, there were activities in the project particularly targeted towards weaker sections labor group for providing works only to villagers. Although there was ample scope and opportunities to address the issues of women by forming self help groups (SHGs) of these sections of the society. This was actively persuaded as was evidence by good growth of SHGs formed and expanded further on their own and doing good work in the watershed communities. User groups (UGs) were formed and soil and water conservation works were taken up by the successfully WCs. SHGs for income generating activities to dairy with milch animals, tailoring, kirana shops and raise nursery of horticultural and forest tree plants in large scale. Support from 10,000 to 1, 00,000 was provided to women SHG's for various activities and utilized fully.

Soil and water conservation structures

Major intervention was soil moisture conservation and soil and water conservation and water harvesting. The total money allocated was Rs784 lakhs for all these works covering most of the delineated watershed area as follows 1.Masonry check dams (CD's) 2. Percolation tanks (PT's), Rock fill dam's (RFD's), Loss boulder structure (LBS), continuous contour trenches (CCT's),Diversion drains, field bunding, cleaning of tank approach channel and repair of minor irrigation tanks. Bunding activity for soil moisture conservation was taken in all watersheds and about 20% of the budget was used for this work. The money spent was about 70-75% of total budget allocated on these works. The money allocated for these works was invested in various structures with 75% in private land s and 25% in public land. The works

done by PIA of either NGO's or government department is almost similar in terms of expenditure incurred. Due to these SWC structures, farmers in different mandals have reported increased availability of water for irrigation mostly to paddy crop and ground water levels rose where open wells (0.6-2.5m) are in use for dry land post rainy season crop supplemental irrigation.

Water Availability for Irrigation and drinking purpose

After a long gap of 10-12 years of construction of CD's and PT's are reduced their functioning as it was due to sediment deposition. Removal of silt is very important to bring back working of these structure's is necessary. Impact of watershed interventions especially masonry structures has been felt very much by the beneficiary farmers in DPAP developed watershed villages in terms of their utility to control erosion, divert water for irrigation and also to some extent ground water increase and water availability for importantly for drinking purpose. Farmers were very much appreciative of the utility of structures in controlling water flow through seepage from foot hills and storage for longer period to irrigate upland paddy fields. Because of regulating and storing water on upstream, period of water availability in the lower reach for irrigation extend from October-November before the watershed development to end of February after the watershed development. This situation favored for double cropping with one or two supplemental irrigations for second crops between Januarys to March every year. In all most all villages there was a clear agreement on availability of drinking water round the year in plenty after watershed development project implementation in their area.

Horticulture, Agro forestry, and social forestry

There was very good plantation of forest trees and horticulture citrus plants in watershed area and about 22% of budget was utilized for this activity. During the initial period of the project fruit plantations like mango, citrus were planted in the farmers private lands of 300ha. As on today the area under citrus and mango plantation increased to 300% due to its higher profit margin. Farmers able to get good margin of profit from 150 to 300% income during one year.

Plantations of forest species was done in common property lands and wastelands and also on road sides besides wood plantations like Pongamia, Sisu, Teak, Bamboo and Subabul sps were distributed covering 590 ha. Plantation was done on road side of village and school premises and indusial farmers also trees were provided. There was also development of pasture and fodder crops for grazing of animals in this common property lands. The milch animals increased and supported fodder availability for higher milk production. Plantation survival was very poor only 26% due to improper protection and in adequate moisture.

Enhanced Agricultural Productivity of seasonal crops

Due to water availability farmers in all watersheds reported increase in area of paddy cultivation almost 30% area increased. Due to availability of water for longer period in the season up to end of March, crops like cotton and pigeon pea were irrigated. Although variability exists in reported productivity enhancement, it varied from as low as 20% to more than 40% increase in main crop as well as second crop in some watersheds. Farmers cultivated paddy in two seasons and harvested good crop with higher crop yield of 30% increase. Yields of paddy in the first season generally increased from 15 to 20 bags per acre and in the second season average yield was up to 20 bags per acre. Although paddy is not an efficient crop for scarce water utilization, farmers are taking up paddy as second crop also in watersheds for food grains and fodder for animals. Fodder was grown largely for cattle's for dairy activity. Horticulture crops were grown majority was citrus and some place it is mango plantation.

Common Property Resources and Wasteland Development

Srikakulam is having large areas of wastelands and planting of Bamboo, Tamarind, Goose berry and Causurina tree plants was taken up successfully under social forestry of this scheme. The project achieved planting of trees in more than 2990 ha. However, in this project horticulture development with cashew nut and goose berry plantation would have helped most of the tribal populated watersheds very much as indicated by the beneficiaries. At present, in one watershed only usufruct rights on 0.5 acre of cashew nut was given to tribals.

Employment and Migration

In the entire 20 watersheds under assessment, only in three (30%) watersheds beneficiaries expressed that labor migration is continuing to the extent of 10 to 20% in their watershed. Labor migration had come down from almost 70% before the watershed development activities. However, wage parity between men and women still exists in most of the watersheds. Labor migration is almost arrested at present due to National Rural Employment Guarantee Scheme of government of India, but can not be attributed to watershed development. As informed by respondent farmers at the time of focused group discussion, 10-20% migration in some of the villages was for higher wage earnings and for especially skilled labor like construction workers and pickle-vendors.

Drought vulnerability

Our analysis of Focused group discussions with village communities indicate that only 70% of the watershed villages sounded that they are not vulnerable to one year of drought as they expressed confidence of growing one crop, as well dairy activity and also horticulture

plantation as their SHG's linkage for credit with banks can help tide over the financial and food insecurity due to crop failures.

Dairy activity

There was little money allocated for animal husbandry that is about 0.8% only. It was mainly because of no of milch animals increase and milk collection centre facility dairy activity progressed very well. The SHG's revolving fund supported purchase of new buffalo's for dairy activity.

Watershed Development Fund

WDF funds collected were in the order of Rs.28.91 lakhs plus interest on principle in 49 watersheds under DPAP-I. If these funds were made available for repair and maintenance of soil and water conservation structures their impact would have been felt better by the beneficiaries in the watershed.

Watershed Development fund should be collected in all the watersheds as per guidelines and deposited in the banks for joint operations by watershed committee and WDT from the PIA. It was reported that DWMA has collected WDF from some WC at the rates applicable, mostly 5% as watersheds are populated with tribals, and the amount has been transferred to PD, DWMA. Farmers and WC members in almost all watersheds mentioned that if the fund were made available for repair and maintenance of watershed structures, or for construction of much needed new structures their impact would have been felt very much by the beneficiaries in the watershed.

Recommendations and Suggestions

1. Desilting of the check dams and percolation tanks is very essential to bring back these structures to perform better for percolation of water for ground water augmentation.

2. The silt removed from the these structure's is very rich in nutrient and fertile and need to used to replenish back to fields for improving the fertility of soil for good crop yields. Farmers are encouraged to go for vermi composting units, planting N-rich Glyricidia plants on bunds and also soil test based fertilizer application for reducing the cost and helps in higher crop yields.

3. Spending money for many LBS can be reduced instead of this many mini percolation tanks and sunken pits on smaller gullies can be done for better results.

4. Field bunding is very essential for soil moisture conservation need to be encouraged in NREGA's works. There is need for outlets of live plants like Agave with stone structure for filtering the soil or drop structure s for reducing the soil erosion from fields to water ways can be taken up.

5. Agro-Horticulture system with plantations of fruit trees on wider row spacing of 30 m can be encouraged with drip irrigation system. The season crops can also be practiced between the tree rows is beneficial.

6. Plantation of trees needs proper protection of tree guards and fencing for better survival with moisture support at least for road side plantation.

7. There should be a support for repairs and desilting of structure with WDF fund or NREGA's works linking them to keep these activities in continuity for better performance and good results.

8. More support in terms of fodder availability need to be provided with improved seed of fodder grasses, maize and sorghum varieties.

9. Improved crop varieties and short duration cultivars and improved cropping system can be adopted for increasing the crop yields. Especially maize pigeon pea and green gram pigeon pea and cotton pigeon pea systems will do better performance.

About ICRISAT

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political organization that does innovative agricultural research and capacity building for sustainable development with a wide array of partners across the globe. ICRISAT's mission is to help empower 644 million poor people to overcome hunger, poverty and a degraded environment in the dry tropics through better agriculture. ICRISAT belongs to the Alliance of Centers of the Consultative Group on International Agricultural Research (CGIAR).

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