

# Eloquent Silent Revolution

WSD -1

*Action &  
Reflection Series*

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## **ELOQUENT “SILENT” REVOLUTION**

### **Executive Summary**

The study of impact of watershed in a year of very severe drought was carried out in May-June 2000 in 16 villages (8 watershed and 8 non-watershed) in drought affected districts of Gujarat State. The study indicates that to a large extent the participatory watershed scheme launched in 1995-96 by the Ministry of Rural Development has been found to mitigate the impact of drought, which frequently stalks the rural areas of several drought prone states in India.

### **Findings**

- Only 1 out of 8 watershed villages required water supply by tankers, whereas 4 non - watershed villages needed it.. (Section 3.1)
- 5 out of 8 watershed villages could save kharif and also took rabi crop, and only 2 villages had total crop failure. Whereas in non - watershed villages, only 1 out of 8 villages could save kharif and took rabi crop; 5 villages could partially save kharif crop and 2 had complete failure. (Section 3.2.1)
- In 3 watershed villages, there was no decrease in crop area and yields. Whereas in 4 non-watershed villages yields reduced by 75%, and in remaining 4 villages there was total failure. (Section 3.2.2 and 3.2.3)
- 7 watershed villages had no shortage of fodder, or moderate shortage. All the non-watershed villages faced severe problem, or problem. The watershed villages could save more animals, particularly the bullocks, and maintained the milk yields. (Section 3.3.1)

- 5 watershed villages could maintain local employment opportunities throughout the drought period. The less fortunate were 4 non-watershed villages that had no employment opportunities; 2 villages had low employment opportunities and only 2 villages had average employment opportunities. (Section 3.4)
- This resulted in large-scale migration in 2 out of 8 non watershed villages had no migration. Whereas in watershed villages, only in 2 villages there was low migration. "Trickle down" effect of watershed are benefiting landless substantially. 4 out of 8 watershed villages hardly required relief employment and for remaining 4 villages it started in April 2000. Whereas 7 out of 8 non watershed villages, required employment works from February 2000. (Section 3.5)
- Food grain availability was comfortable in 6 out of 8 watershed villages. In non- watershed the problem is acute in 1 village and serious in 7 villages. (Section 3.6)
- Impact on the quality of life in 4 different watershed villages even during the drought year revealed that: (Section 4)
  - Houses being renovated
  - 100 % loan recovery of service co-operative
  - Handpumps continued yielding water
    - A village spared water for a neighboring non watershed village
    - Daily bath and wearing of washed clothes. People in non watershed villages cannot afford daily bath & change of clothes.

- Drawing lesson, there are several policy issues raised and policy initiatives suggested in the study - most important is the cost effectiveness of watershed programme for scarcity relief.
- No scheme can be all merits and no flaws. Development Support Centre has studied in depth the flaws in design and shortcomings in implementation of the watershed scheme through two previous studies- a) Unique Strengths and Mutilating Flaws in Watershed Development; b) "In the Hands of the People" - Indian Case Study of Watershed Development.

### **Policy Issues**

- The present study has brought out the need for policy change with respect to:
- Moving from watershed development to "Watershed Plus" which would capitalize on the infrastructure created during the development phase for productivity and income enhancement. (Section 5)
- Need to emphasize in the planning process for watershed development, the importance of ensuring steady supply of drinking water, relying largely on knowledge, experience in uses and needs for water of women. (Section 5.1)
- Even where there is regional piped water supply, it is useful to ensure the steady supply of water through creation of rain water harvesting structures at the village level. (Section 5.1)
- In the rural economy, animals are extremely important but augmenting fodder supply and storing it for drought years have not received much importance. Developing public lands for increasing fodder supply for the landless are not receiving sufficient attention. (Section 5.3)

- Watershed to become a major component in planning for scarcity relief. Rough calculations made in this study indicate that "pre-watershed" development can be initiated from the state share of the funding pattern of watershed programme (75% Centre share, 25% State share) in the drought prone areas. (Section 5.4)
- Watershed approach is found important in sustaining supply of life saving water, fodder, food grains, employment, animals. It does not justify reaching to conclusion that there is no need for storing water in large reservoirs. May be such water would be required in 2<sup>nd</sup>/3<sup>rd</sup> year of drought and for urban centres and water consuming industries. All such issue needs to be studied in depth over a long period. (Section 5.4)

These are the highlights of the first batch of participatory watershed development projects. To the extent, learning approach could be adopted in policy and implementation improvement, successive batches will be showing better performance.

## **ELOQUENT "SILENT" REVOLUTION**

### **1 Introduction**

The current debate in Gujarat is only whether the 1999-2000 drought was the worst in last 100 years or the drought of 1987-88 was worse. In any case, it was indeed a very severe drought year. The drought touched 9449 villages in 155 talukas of 17 districts and affected 2.3 crore people and 7.13 lakh livestock. Government of Gujarat (GoG) has spent a staggering amount in excess to Rs. 600 crores on the drought relief.

And all this was despite the fact that the Drought Prone Area Development Programme (DPAP) has been in operation in these areas for almost two decades. The programme emphasized increasing the productivity of the drought prone areas by conserving soil and moisture, and thereby reducing the impact of the severity of the drought to the human and cattle population. But it is depressing to notice that as Gujarat and other drought prone states had to cope this year with such a grave situation, although out of the last 12 years only in 4 years there was inadequate rainfall. Usually the drought areas face scarcity situation in 3 out of 8 years- putting people to acute suffering and government to great strain by diverting its finances and human resources from development to relief. The average annual rainfall in these areas during the scarcity year is less than 300 mm. not sufficient even for kharif crop. The rainfall pattern during the last ten years of the selected drought prone districts in Gujarat is appended as Annexure -1.

**Table -1, Rainfall pattern during the last ten years in the eight districts of Saurashtra, Kachch and North Gujarat<sup>1</sup>.**

Scenario	Years
Normal year and more	2
20 % less than normal year	3
70% less than normal year	2
40% less than normal year	2
More than 50 % less than normal year	1

Experience of Development Support Centre's (DSC) working as a Programme Implementing Agency (PIA) of the Ministry of Rural Development's (MoRD) Watershed Development Programme (WDP) in 11 villages of Dhari taluka in Amreli district, however, revealed that there was a distinct difference between the severity of drought impact in the villages benefiting from the watershed programme, and those not benefiting. When other villages of Dhari taluka were suffering from drought, its impact was much less in the 11 villages where watershed development scheme was implemented. Since December 1996, when watershed scheme started situation has been fairly comfortable with respect to drinking water, crop yield, fodder supply and employment. Is it true for watershed projects in other districts managed by other PIAs? A severe drought year was a good time to test the validity of the claim that the participatory watershed development programme launched by MoRD in 1995 has ushered "silent revolution" in the rural areas. The watershed programme envisages a "bottom up" planning approach, working preferably through Non Governmental Organisations (NGOs) and with community organisations as the central principal.

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<sup>1</sup> The districts are Jamnagar, Rajkot, Surendrangar, Amreli, Kachch, Banaskantha, Sabarkantha and Bhavnagar. Oza, Dighant, 2000."Availability of drinking water from annual rainfall", Jal Sewa , Vol. 16, July.



## 2 Study Area & Methodology

DSC instituted a field based research study to assess the impact of the watershed development programme. Eight districts (Kachchh, Rajkot, Jamnagar, Bhavnagar, Amreli, Banaskantha, Sabarkantha and Surendranagar) reeling under the drought were selected. The study aimed at comparing the impact of drought in two categories of villages with similar socio-economic and topographic attributes. One, villages with benefit of watershed programme for last 4 to 5 years - **WATERSHED VILLAGES**. The watershed villages should have also utilized at least 70% of the total budget allocated under the programme. Second, adjoining villages without the benefit of watershed development programme - **CONTROL VILLAGES**. Thus, in each district, two villages (one watershed village and one control village) were selected. The primary data was collected through participatory rural appraisal techniques, field observations and focused group discussions. The secondary data consisted of - land use pattern, area under cultivation and irrigation, accomplishments of the village under the watershed programme. The map of Gujarat in India is appended as Annexure – 2 and the map of Gujarat with location of study villages is appended as Annexure –3.

## 3 Findings

The overall impact is not only positive but also impressive. The watershed development revolution should not remain silent; it is time that it becomes eloquent. The overall findings of the field study on key parameters are placed below. The detailed findings are provided in Annexure - 4.

### 3.1 Drinking water

During the selection of villages for watershed programme, priority was given to those villages having drinking water scarcity.

#### Watershed Villages

Out of 8 watershed villages:

- Prior to the benefit of treatment, 2 villages had no problem, 3 had moderate problem, 1 had problem and 2 villages had severe problem.

- After the benefit of watershed treatment in normal years, **7** villages became comfortable in drinking water and **1** village has still moderate problem.
- Even during the drought year, **5** villages did not face any problem throughout the year, **1** village after February and **2** villages experienced the problem only after April 2000. And of these, only **1** village required water supply through tankers.

### Control Villages

Out of the **8** control villages:

- In normal years **4** villages had no problem, **3** villages had moderate problem and only **1** village had problem.
- But in drought year, **4** villages faced severe water problem from November-December of 1999. Only **1** village had no problem throughout the year, **2** villages could manage upto January 2000 and **1** village upto April. And of these, **4** villages required water through tankers.

Table -2, Drinking water scenario

Scenario		Watershed villages (8 villages)			Control villages (8 villages)	
		Pre –Wsd (Normal year)	Post – Wsd (Normal year)	1999-2000 drought year	Normal Year	1999-2000 drought year
a.	No problem (available through out the year)	2 villages	7 villages	5 villages	4 villages	1 village
b.	Moderate problem (available till April)	3 villages	1 village	2 villages	3 villages	1 village
c.	Problem: (available till January - February)	1 village	-	1 village	1 village	2 villages
d.	Severe Problem (available till November - December)	2 villages	-	-	-	4 villages
e.	No. of villages supplied water through tankers	(Information was not available)	-	1 village	(Information was not available)	4 villages

Major Sources: (Watershed villages: Hand pumps & Community wells- 7 villages, Water supply pipeline- 1 village; Control villages: Hand pumps & Community wells-6 villages, Water supply pipeline- 2 villages).

### **3.2 Crop**

#### **3.2.1 Crop season**

##### **Watershed villages**

In **3** of the **8** watershed villages, the farmers could take crop in kharif, rabi and even summer. In **2** villages, crop was raised in kharif and rabi. In **1** village the farmers could take only kharif crop. Only **2** village faced total failure of crops.

##### **Control villages**

In contrast, in **8** control villages, **2** villages had total crop failure, **5** village could take only kharif crop and only **1** village both kharif & rabi crops.

**Table -3, Crop Season**

	Scenarios	Watershed villages (8 villages)	Control villages ( 8 villages)
		1999-2000 drought year	1999-2000 drought year
a.	Three Seasons ( Kharif, Rabi & Summer)	3 villages	-
b.	Two Seasons ( Kharif & Rabi)	2 villages	1 villages
c.	One Season ( Kharif)	1 village	5 villages
d.	Nil	2 villages	2 villages

#### **3.2.2 Crop Area**

##### **Watershed Villages**

Apart from the number of seasons when crops could be raised, findings also reveal that out of **8** watershed villages, in **3** villages there was hardly any change in cropping area. In **1** village crop area decreased by 10%, in another **1** village by 20-50%. There was **1** village that could raise crop only on 25% of the crop land. There was also **2** village where crop had failed totally. This was because there was very less rainfall in these village for two consecutive year.

### Control Villages

In the **8** control villages, crop had failed totally in **4** villages, in **1** village more than 75%, in **2** villages it decreased by 50-75%, in **2** villages upto 50% and **1** village had reduction in cropping area of only 20%.

The change in the crop area between watershed village and control village is because as many as 7 watershed villages were able to provide support irrigation to their kharif crop, when dry spell started. Irrigation facility for saving kharif crop is the most important gain for the watershed villages. Even the irrigation projects in drought prone areas aim at saving kharif crop, hence known as "Protective Irrigation Projects". Watershed programme provides protective irrigation from private wells without the huge public investment in irrigation management.

**Table –4, Crop Area**

	Scenario	Watershed village (8 villages)	Control village (8 villages)
		1999-2000 drought year	1999-2000 drought year
a.	Negligible change in cropping area (compared to the normal year)	3 villages	-
b.	Upto 10 % decrease in cropping area	1 villages	-
c.	10 - 20 % decrease in cropping area	-	-
d.	20 - 50 % decrease in cropping area	1 villages	1 villages
e.	50 - 75 % decrease in cropping area		2 villages
f.	More than 75 % decrease in cropping area	1 village	1 village
g.	Crops failed	2 village	4 villages

### 3.2.3 Productivity of Main Crops - Yields

The impact on the yields is important to know the extent of the benefits from watershed programme.

### Watershed villages

Among **8** watershed villages, interestingly in **1** village there is increase in the yield. In **2** villages there are hardly any decrease both in kharif and rabi crop yield. There is 25 % decrease in the yield in **1** village both in kharif and rabi and, similarly 50% decrease in **1** village in kharif and rabi. In **2** village crops totally failed.

### Control Villages

Out of **8** control villages, in as many in **4** villages the yield of kharif crop decreased by more than 50 % and failed in the rest **4** villages. In case of rabi, the yield decreased by more than 50 % in **1** villages. **7** villages could not even sow rabi crop.

**Table –5, Crop yield**

	Scenario	Watershed Villages ( 8 villages)		Control Villages (8 villages)	
		Kharif	Rabi	Kharif	Rabi
a.	Increase in yield	1 village	-	-	-
b.	Negligible change in yield	1 village	2 villages	-	-
c.	0 -10% decrease in yield	-	-	-	-
d.	10-25% decrease in yield	2 villages	1 village	-	-
e.	25-50% decrease in yield	1 village	1 village	-	-
f.	More than 50% decrease	1 village	1 village	4 villages	1 villages
g.	100 % failure	2 village	-	4 villages	-

Main Crops: [Watershed village: Kharif: Groundnut- 3 villages, Paddy - 1 villages, Bajri- 2 villages, Cotton -1 village ; Rabi: Wheat - 5 villages; Control village: Kharif: Groundnut- 5 villages, Rabi: Wheat - 1 village. Summer Crops is Fodder].

The impact of all these benefits on agriculture is reflected in increase in the land prices of watershed villages, particularly the lands with wells close to rain water harvesting structures. This brings closer the comparison of watershed development with irrigation development.

### **3.3 Fodder & Animal Husbandry**

#### **3.3.1 Fodder Availability**

##### **Watershed villages**

Out of **8** villages, **2** villages had no shortage of fodder, **5** villages had moderate problem after April 2000 and **1** village started facing problem from January-February.

##### **Control Villages**

In the control villages, **7** villages faced severe problem of fodder shortage from November-December and **1** village that was better off experienced problem from January-February.

**Table – 6, Fodder Availability**

	Scenario	Watershed Villages (8 villages)		Control Villages (8 Villages)	
		Pre - Wsd (Normal year)	1999-2000 drought year	Normal Year	1999-2000 drought year
a.	No problem (Fodder is available throughout the year)	2 villages	2 villages	3 villages	-
b.	Moderate problem (Fodder was available till April)	2 villages	5 villages	4 villages	-
c.	Problem: (Fodder was available till January - February)	-	1 village	1 village	1 village
d.	Severe Problem (Fodder was available till November - December)	4 villages	-	-	7 villages

#### **3.3.2 Cattle population**

##### **Watershed Villages**

Out of **8** watershed villages, **5** villages saw cattle population decreased only upto 10%, **1** village between 10-20% and in other **2** villages it decreased between 20 - 30%.

## Control Villages

In contrast in **8** control villages, **4** village the decrease was between 50 - 75%, in **2** villages 30 -50%, in **1** village there was 10-20 % decrease and only **1** village the decrease was less than 10%.

**Table – 7, Cattle Population**

	Scenario	Watershed village (8 villages)	Control village (8 villages)
		1999-2000 drought year	1999-2000 drought year
a.	Negligible change in cattle population (compared to the normal year)		-
b.	Less than 10 % decrease in cattle population	5 villages	1 village
c.	10 - 20 % decrease in cattle population	1 village	1 village
d.	20 - 30 % decrease in cattle population	2 villages	-
e.	30 - 50 % decrease in cattle population	-	2 village
f.	50 - 75 % decrease in cattle population	-	4 village

Reduction of animal population was usually sequenced as: first were dry cows, second milking cows, third weak bullocks, fourth dry buffaloes and last to be disposed of would be good buffaloes and good bullocks. First by selling, then taking the animals on migration are the ways to reduce the burden of feeding them locally. The ' useless' animals are also let loose to die. It may be ~~red~~ that misery of people in non-watershed villages must have been more intense as they sold 26% of their bullocks, against 9% in the watershed villages.

**Table – 8, Reduction in Cattle Population**

	Cattle	Watershed villages (8 villages)			Control villages (8 villages)		
		Migrated	Sold	Died	Migrated	Sold	Died
a.	Cow	29 %	6%	4%	3%	8%	4%
b.	Bullock	4%	9%	2%	10%	26%	1%
c.	Buffalo	6%	7%	2%	9%	5%	3%
d.	Goat	-	-	-	4%	-	3%
e.	Sheep	-	-	-	15%	-	10%
f.	Overall	9%	5%	2%	13%	6%	5%

### 3.3.3 Milk Yield

#### Watershed Villages

With regard to milk yield in the **8** watershed villages, there was hardly any fall in the **2** villages. In **3** villages the decrease was upto 40% and in the remaining **3** villages, the reduction in milk yield was upto 50%. Incase of milk yield of buffaloes, even the watershed villages faced problem of decrease. Out of **8** watershed villages, and only in **2** villages there was negligible change, **1** village 25% decrease, **3** villages 30% fall, **1** village 40% fall and only in **1** village 60% decrease in milk yield.

#### Control Villages

In control villages, **1** village had fall of more than 70% in the milk yield, in **3** villages had fall upto 70% and **4** villages upto 40%. This was for cows. Similarly for buffalo, **4** villages had fall in yield of more than 60% and more **4** villages upto 40%.

**Table – 9, Milk yield of Cows**

	Scenario	Watershed villages (8 villages)	Control village (8 villages)
		1999-2000 drought year	1999-2000 drought year
a.	Negligible change in yield (compared to the normal year)	2 villages	-
b.	40 % decrease in yield	3 villages	4 villages
c.	50 % decrease in yield	3 villages	-
d.	70 % decrease in yield	-	3 villages
e.	More than 70 % decrease in yield	-	1 villages

**Table –10, Milk yield of Buffaloes**

	Scenario	Watershed villages (8 villages)	Control villages (8 villages)
a.	Negligible change in yield (compared to the normal year)	2 villages	-
b.	25 % decrease in yield	1 village	-
c.	30 % decrease in yield	3 villages	-
d.	40 % decrease in yield	1 village	4 villages
e.	50 % decrease in yield	-	-
f.	60 % decrease in yield	1 village	-
g.	More than 60 % decrease in yield		4 villages



### **3.4 Local employment**

#### **Watershed villages**

Out of **8** watershed villages:

- Before watershed, **2** villages had satisfactory or good local employment, **3** villages had average and **3** villages low employment.
- After watershed in a normal year, **4** villages had good employment availability and **3** village' s satisfactory availability, only **1** village had low employment.
- During the drought year, **1** village had still good employment, **3** villages average employment, **2** villages with low employment and **2** with no employment.

#### **Control villages**

Out of **8** control villages:

- Before drought, **2** villages had good employment and **2** satisfactory employment. **1** village had average employment and **3** villages had low employment. The situation was almost same as compared to the villages with watershed benefit.
- However after the drought, **2** villages had average employment, **2** villages had low employment and **4** villages had no employment.

**Table -10, Local Employment**

	Scenario	Watershed villages (8 villages)			Control villages (8 villages)	
		Pre -Wsd (Normal year)	Post - Wsd (Normal year)	1999-2000 drought year	Normal Year	1999-2000 drought year
a.	Low employment	3 villages	1 village	2 villages	3 villages	
b.	Average employment	3 villages	-	3 villages	1 villages	2 villages
c.	Satisfactory employment	1 village	3 villages	-	2 village	2 villages
d.	Good employment	1 villages	4 villages	1 village	2 village	
e.	No employment			2 villages		4 villages

This small study has brought out that watershed programme provides employment to landless during implementation on development works and after implementation increased opportunity for employment continues. This would mean that the so-called "trickle" effect of development for the benefit of poor is not negligible. In fact it may be the most welcome benefit to the landless - no need to either pushing to migrate or seek employment on Government relief works. Investment in watershed of course benefits more the farming community but benefit to landless is substantial. This needs to be verified through a more extensive study focusing on the benefit of watershed development to the families with land and to the landless.

### **3.5 Migration**

Again, the study brought out more pointedly the information about migration which is a common phenomenon in drought prone areas - people, particularly males, leaving their village in search of employment and income in central and south Gujarat, to return in the next rainy season.

#### **Watershed villages**

Out of **8** watershed villages:

- Before treatment, there were **2** villages with very high migration, **2** villages with high migration, 3 villages with low migration and **1** village with no migration.
- After watershed development, there were **3** villages with low migration and **2** villages with moderate migration and only **1** village with high migration. In fact, there were **2** villages from which migration had stopped.
- During the drought, also there is only **1** village with very high migration and still in **2** villages, no migration has taken place. The remaining are **3** villages with low migration and **2** villages with moderate migration.

#### **Control villages**

In **8** control villages:

- In normal years, there were **4** villages with very high migration, **2** villages with high migration, **1** village with moderate migration and only **1** village with low migration.
- During the drought, **6** villages had very high migration and **2** village have high migration.

**Table -12, Forced Migration**

	Scenario	Watershed villages (8 villages)			Control villages (8 villages)	
		Pre –Wsd (Normal year)	Post - Wsd (Normal year)	1999-2000 drought year	Normal Year	1999-2000 drought year
a.	No migration	1 village	2 villages	2 villages		
b.	Low migration (3 months)	3 villages	3 villages	3 villages	1 village	-
c.	Moderate migration (3-6 months)	-	2 villages	2 village	1 villages	-
d.	High migration (6-9 months)	2 villages	1 village	-	2 village	2 villages
e.	Very high migration (more than 9 months)	2 villages		1 village	4 villages	6 villages

This information corroborates inference of increased employment opportunity for the landless in the watershed villages not only during good year but also in drought years.

In Saurashtra villages, migration to south Gujarat on search of better income particularly in diamond cutting industry is common. Even in comparatively prosperous families, this is a ' pull' factor of migration, which is healthy, as it is long term settling down in prosperous towns. However, there are villages where on account of low availability of employment within the village people are forced to migrate - ' push' factor. During drought even village like Thordi (Bhavnagar district), which normally require labour from outside had its own inhabitants leaving the village in search of livelihood. In the neighbouring watershed village Dedakadi, even during the drought year, the increased agriculture activity on account of watershed benefit required labour from outside!

### **3.6 Food Security**

This information is interesting particularly for Saurashtra villages, which are known for raising in kharif cash crop of groundnut in preference to crop of food grains, and yet watershed helped them to become self-sufficient in food grains. It

is mainly on account of raising second crop of wheat with the help of augmented ground water recharge.

#### Watershed villages

In 8 watershed villages:

- There were low shortages of food supply in **all** villages before watershed development.
- After watershed too only **2** villages continue to have low shortage. In **6** villages there were no longer any shortage.
- Even in drought **1** village had no shortage, **5** villages had moderate shortage and **2** villages had low problem.

#### Control villages

Out of **8** control villages:

- The situation was similar as watershed villages before treatment. **7** villages had low shortage and **1** village moderate shortage.
- However, during drought the problem became acute in **1** village and moderately serious in other **7** villages.

**Table -13, Food security**

	Scenario	Watershed villages (8 villages)			Control villages (8 villages)	
		Pre –Wsd (Normal year)	Post - Wsd (Normal year)	1999-2000 drought year	Normal Year	1999-2000 drought year
a.	No shortage	-	6 villages	1 village	-	-
b.	Low shortage (1 to 3 months)	8 villages	2 villages	2 villages	7 village	-
c.	Moderate shortage (3-6 months)	-	-	5 villages	1 villages	7 villages
d.	High shortage (6-9 months)	-	-	-	-	1 village

#### **4 Impact of watershed programme on the life of people.**

##### Watershed Villages

- At Bhupgarh village in Rajkot district, it was found that even in the drought year more than 100 houses were being renovated. The villagers were investing their savings in diamond cutting industry and other small-scale industries that would add to their assets and income in the future. The local service cooperative society could recover 100% of its loan.
- At Padan village in Banaskantha district, even though there were problems in the crop yield there was enough saving of the previous year. The researcher could observe that numbers of houses were being renovated and 17 new tractors bought.
- At Dedakadi village in Bhavnagar district, the crop areas and yield were maintained to such an extent that the farmers were not only self sufficient in their food requirement, they could even sell the surplus food grains.
- At Khicha village in Amreli district: 1991, 1993, 1994 & 1995 were the years of below average rainfall and tankers supplied water. However, not after watershed, though 1999 was a very bad drought year.

- A government water pipeline serves Lavarli village in Jamnagar district. While planning for watershed development, the villagers thought water supply through pipes was unreliable, and hence, decided to renovate tanks that would store water and recharge their drinking water wells.
- At both Bhupgadh and Dedakdi village, all the hand-pumps were working satisfactorily throughout drought period. At Kanera in Sabarkantha district, they were not only self sufficient in their water requirement, they could spare some water for the neighbouring village of Pishal, a non-watershed village. The Pishal villagers collected their water from Kanera in drums mounted on the bullock carts and women also went to Kanera to wash their clothes and bring water in the peachers on their head.
- Availability of water also determines quality of life. This was reflected in personal cleanliness of the villagers at Bhupgarh. In the neighbouring village Ramadiya (a control village), researcher was informed that they could not even afford to take bath every alternate day. They indeed looked unclean wearing soiled clothes!

### Control Villages

In contrast, in control villages the people had different story to tell. At Virpur in Amreli district, the villagers informed the researcher that it would take them four years to come out of the depression caused by severity of drought. They had sold their milch animals and mortgaged their gold to take loan. All this will be balanced only if the next four years are normal. At Jaloya in Banaskantha district, even though previous year was quite normal, the villagers had not conserved water and therefore one year of drought caused severe strain to the economy of the village

## 5 Policy implications

Watershed Development Scheme of the Ministry of Rural Development is admittedly the best scheme for sustainable and equitable rural development. Like any other scheme, however well conceived, it has its own limitations. We have been regularly studying the scheme and its implementation, pointing out the shortcomings and suggesting remedial action. This has been done intensely through following studies and papers.

a? In the Hands of the People - Indian Case Study of Watershed Development<sup>2</sup>

b? Unique Strengths and Mutilating Flaws in Watershed Development<sup>3</sup>

The present study highlights how the intended benefits of mitigating the impact of drought through watershed programme have been achieved to a substantial extent in terms of availability of drinking water, food security, fodder for the livestock and employment for the needy. At the same time our detailed inquiry about impact of drought on various aspects of human and animal life has also brought to our notice the scope for improving the working of the scheme that will ensure greater benefit to the people when they face drought situation in future.

Two obvious improvements required:

a) At present watershed development lays the foundation for increase in productivity of local resources. To realize higher gains of the potential created requires several initiatives and measures by way of extension and linkages to resources of knowledge, credit, marketing etc. This is now known as ' Watershed Plus' , which may be either undertaken parallel with watershed development or it may be sequenced later. ' Watershed Plus' will further

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<sup>2</sup> Shah, Anil, 1999. In the Hands of the People- Indian Case Study of Watershed Development, Policies That Work, International Institute of Environment and Development (IIED), London, U.K

<sup>3</sup> Shah, Anil, 1999. "Unique Strengths and Mutilating Flaws in Watershed Development", Journal of Rural Development, NIRD, Hyderabad, Vol: 18 (4) pp 613-620.



enhance the food security and availability of fodder as well as opportunity to gainful employment.

- b) Making watershed development as a major component of planning for scarcity relief, this in Gujarat is with Revenue Department. The author tried between October 1999 and 2000 April to persuade the Gujarat Revenue Department to give prominent position of watershed development in its planning for scarcity relief. May be it may be considered seriously in the next drought!

### **5.1 Drinking Water**

The importance of drinking water has been emphasised in the very process of selection of villages to be brought under watershed. However, the male dominated decision making in the watershed villages has given priority to rain water harvesting that will raise the water table in the irrigation wells. Women have been drawing attention to the importance of ensuring good supply of water in drinking water wells. This has not been done adequately. There is need to emphasize in the planning process for watershed development the importance of ensuring steady supply of drinking water. A participatory rural appraisal (PRA) could be developed which would bring out the knowledge, experience in uses and needs of the women for water in a village for different localities and communities depending upon various sources of water they draw and the size of their family. The author has started working on developing a tropical PRA on women and water.

An interesting finding in the study is about people' s view about reliability of regional water supply scheme installed and managed by government agencies. Such schemes usually serve several villages and therefore there is always the possibility of interruption in the water supply by unauthorized over-use of water by upstream villages. Therefore, in this study 3 villages that have the benefit of regional piped water supply have sought to ensure steady supply of water

through creation of rain water harvesting structures in a manner that will augment local water supply. This may be considered as an important requirement in all villages that are served by regional water supply scheme.

If PRA exercises of women and water bring out the need for giving priority to augmentation of water supply for domestic needs, it may become necessary to install rain water harvesting structures near the village site. Starting of watershed treatment on lower slopes violates the principle of ridge to valley development. However such structures, usually one or two check dams, can be designed keeping in view the possibility of more rain water harvesting treatments and structures that would be developed on the higher slopes, reducing the flow of water.

## **5.2 Fodder Supply**

### **Animals**

It is a matter of concern that animals - both milch and draft animals are extremely important in the economy of the village community particularly drought prone areas and yet sufficient attention has not been given to ensuring steady supply of fodder and grasses in lean years. Watershed scheme requires development of all public and private lands falling within the micro watershed. Only in 3 out of 8 villages attempt was made to develop grasses in public lands, but without adequate arrangement for protection, whatever was planted failed. Secondly, Saurashtra villages have preference for cash crops of groundnut and cotton and therefore they face more severe problem of fodder supply. In the very planning of watershed there is need to give due consideration to raising of crops that will provide security of food as well as fodder. This is neglected may be for two reasons:

- a) Milch animals are in the care of women who do not have strong presence and voice in the decision-making in watershed planning.

- b) The communities of cowherds, locally called ' maldharis' , are disadvantaged groups in the village community and therefore they also cannot strongly voice their requirements as stakeholders in the watershed programme. Maldharis are also a difficult community. This needs to be emphasized in the scheme and in the training programmes of key personnel in the watershed programme.

### **5.3 Employment**

There has been apprehension that watershed scheme being land based; it will benefit only those who own land and not the landless. The study has brought out that the landless depending upon employment in agriculture related activities benefit substantially first during implementation when they are engaged in wage employment and subsequently on account of increase in agriculture activities particularly due to extension of irrigation. That is why out of 8 villages in watershed 5 villages hardly required any relief works for employment and in 3 villages the relief works were started only in April month. The situation has been very different in control villages where out of 8 villages relief works had to be started by government in 6 villages from February to June 2000.

It is therefore important that watershed programme is given priority in planning for relief works during drought years. Since watershed development is expected to be planned over a period, preliminary processes of watershed planning can be initiated, to be implemented as soon as there are indications of drought. Other advantage is that there is no need to set up new machinery or divert the manpower resources of the Government for planning and implementing scarcity relief works. The manpower and experts are readily available in the PIAs and their Watershed Development Teams.

#### **5.4 Watershed and Scarcity Relief**

Programme of watershed as planned now requires investment of Rs.4000 per ha. This amount is to be spent over 4 years, and therefore, every year about Rs.1000 per hectare is to be spent. Assuming that 3 out of 8 years in the drought prone areas would be drought years requiring relief activities, Government would have to spend any way about Rs 2000 per hectare in 3 years out of 8, average Rs 750 per hectare per year<sup>4</sup>. Therefore, Government needs to invest only Rs 250 more per hectare per year for undertaking watershed programme. Government of India plans watershed programme and provides 75 % funds, remaining 25 % coming from the state government. If necessary the programme may be initiated by state governments in the years when there is possibility of drought. The state government may like to keep watershed plan ready and when there is threat of drought may start them as "pre-watershed projects." Watershed indeed provides sustainable employment during construction and later to meet large requirement of the use of developed resources.

#### **5.5 Not rushing to conclusion about Small vs. Large**

The impact of watershed development is impressive in sustaining supply of life saving water, fodder, food grains, employment, and animals. However, there could be successive good years and successive years of low rainfall. How many of the watershed villages could face series of drought years is not known. The good results of watershed development in one year of drought do not justify reaching to conclusion that there is no need for storing rain water in large reservoirs. May be such water is required in second / third year of drought.

Again, watershed development helps rural areas locally. They may not be able to generate surplus water for urban centres and water consuming industries. Also in the years of excessive rainfall, water spilling over all small structures may still flow to the sea. Therefore, large water storing structures may be needed for storing water from the perennial rivers as in South Gujarat and for flash flooding

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<sup>4</sup> Based on the data collected during the field studies of the research project.

streams even in drought prone areas in the years of excessive rainfall. All such issues need to be studied in depth over in a longer period.

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