Advantage Watershed

A Longitudinal Study of Sixteen Drought Prone Villages Of Gujarat

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'ADVANTAGE' WATERSHED In 2nd Year of Drought (Sequel to "Eloquent Silent Revolution")

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I Executive Summary

(1) Findings of earlier study 'Eloquent Silent Revolution'

Development Support Centre's study of impact of drought in 16 villages (8 watershed and 8 non-watershed villages) in 8 drought stricken districts of Gujarat was carried out during very sever drought of 1999-2000, and published in August 2000: "Eloquent Silent Revolution", The study examined the impact in terms of the following parameters.

- 1. Drinking Water
- 2. Crop Season
- 3. Crop Area
- 4. Crop Yield
- 5. Fodder Availability
- 6. Cattle Population
- 7. Milk Yield of Cows & Buffaloes
- 8. Local Employment
- 9. Migration
- 10. Food Security

Drinking water

Only 1 out of 8 watershed villages required water supply by tankers, whereas 4 non - watershed villages needed it.

Crop

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.

Crop area

Out of 8 watershed villages, in 3 villages there was hardly any change in cropping area. In 2 villages crop area decreased by 10

Out of 8 control villages crop had failed totally in 4 villages, in 1 village more than 75%, in 2 villages it decreased by 50-75%.

Crop yield

There was no decrease in crop area and yields in **3** watershed villages. Whereas in **4** non-watershed villages the yields were reduced by 75%, and in remaining **4** villages there was total failure.

Fodder availability

7 watershed villages had no shortage of fodder, or moderate shortage. All the nonwatershed villages faced severe problem, or moderate problem. The watershed villages could save more animals, particularly the bullocks, and maintained the milk yields.

Local employment

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. **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.

Food Security

Food grain availability was comfortable in 6 out of 8 watershed villages. In nonwatershed villages the problem was acute in 1 village and serious in 7 villages.

Impact on the quality of life in **4** different watershed villages even during the drought year revealed that:

- Houses being renovated
- ♣ 100 % loan recovery of service co-operative
- Hand pumps continued yielding water
- A village spared water for a neighboring non-watershed village
- Daily bath and wearing of washed clothes. People in non-watershed neighbouring cannot afford daily bath & change of clothes.

(2) 2nd Year of drought

Unfortunately for Gujarat, drought conditions continued next year, 2000-2001. We had foreseen the possibility when in the study "Eloquent Silent Revolution" we had said towards the end "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". Therefore when this actually happened and the drought conditions were repeated next year 2000-2001 DSC revisited the same villages to ascertain if watershed programme continued to confer the advantage to the villages that had the benefit of watershed programme as compared to non-watershed villages.

Drinking water

Only in 2 out of 8 watershed villages water was supplied through tankers: whereas water tankers had to supply water to 4 control villages.

Crop season

Out of 8 watershed villages, 1 village could take crop in Kharif as well as Rabi season and one village could take crop in three seasons – Kharif, Rabi and Summer; whereas only one control village was able to take Kharif and Rabi crops.

Crop Area

During Rabi season in two villages there was increase of 20-50% of the crop area during Rabi and two villages it was more than 100% and there was sowing even in summer season. In control non-watershed villages one village that could take Rabi crop had a moderate increase in the area.

Crop Yields

In 3 Watershed villages the yield was up to 500Kg/ha and 2 villages had more than 500 Kg/Ha and one village more than 1000 kg/ha. In Rabi also 3 watershed villages that raised Rabi crop, the yields were 500 to 1000 Kg/Ha. In 3 nonwatershed villages yields were less than 500 kg, and one village that raised Rabi crop, the yield was less than 100KG/Ha !

Fodder Availability

Only one village with watershed benefit had to bring grass from outside, whereas this was the condition in four non-watershed villages.

Cattle Population

The sever decline in population took place in four water villages, it was so in five controlled villages.

<u>Local employment</u> Even in the 2^{nd} year of drought **4** watershed villages had employment opportunities within the village, whereas 6 control villages had no employment to offer, and 2 villages low employment.

Migration

Though migration took place in all the **16** watershed and non-watershed villages, only the severity was less in watershed villages. High migration (6-9 months) and very high migration (more than 9 months) took place in 6 villages with watershed benefits, whereas it was the case in all 8 control villages.

Food Security

Shortage of food affected all the 16 villages but watershed villages have some advantage over non-watershed villages . Three of them have low and moderate shortage and 5 had high shortage; whereas in case of non-watershed village 7 had high shortage and one very high shortage.

(3) Policy Implications

In the continuing drought in the 2nd year the advantage of watershed villages over non-watershed villages was very much reduced. Need to examine if more intensive investment and measures are needed for securing continuing availability of water, fodder and food grains.

- Identify villages in such drought prone areas which are still comfortable with availability of water, fodder etc and find out the reasons for them and to what extent they could be incorporated in the watershed scheme.
- To realize higher gains of potential created during watershed development, need for initiatives and measures to establish linkages to resources of knowledge, credit, marketing etc known as 'Watershed Plus''.
- Drinking water: Dominated by male members of the watershed community, it is essential to emphasize priority to domestic water supply in the watershed planning process.
- Fodder supply: As compared to the grains and nuts the fodder part of the crops need to be given importance by researchers and also by the farmers. It would be useful to run pilot projects on fodder banks.
- Employment and scarcity relief: Watershed development approach and systems need to be adopted while undertaking works programmes for employment during drought periods. The employment and investment would thus be more productive and in a way contribute to the drought proofing.

(4) Survival struggle during drought:

Outside agencies, governmental and non-Governmental, deliver their services during drought at the village level and some times extend it to destitute families. It is very rare that understanding is obtained and concern expressed about how within the home, amongst the members of the family – men, women, children and even animals have to struggle to conserve their resources and make sacrifices for the sole purpose of surviving the drought period. The study gives information on economic impact, impact on health, social aspects and on animals. Detailed information is provided on how people have to struggle to economize on the use of water, food and social activities.

The study recommends the role of public services in arranging relief employment, subsidized grass, care of the sick and loan finance. The adequacy of these services and their quality become extremely important.

The study also examines role of voluntary sector and recommends that the agencies engaged in health and family welfare need to make an effort to reach out to the poor and the more vulnerable in a village. Such agencies can also

promote innovative ideas of drought proofing such as of protecting drinking water, food grain and fodder bank etc.

(5) Sensitization

An attempt is made in this study to present field investigations about economic and social impact of drought but such reporting cannot bring out prolonged physical wretchedness and mental agony through which the whole community has to pass until not the next rain but the next harvest. Only creative writers who can delve in the minds of the people can vividly portray how drought impacts the inner core of the life of the village community. The paper then presents the excerpts from two novels in Gujaratii - "Manvini Bhavai" that tells th e story of a village that is subjected to relentleass torment for the waterless years in the famine of 1900 that dehuminize most people (Box 1).

The Box No.2 gives excerpts from another novel "Asnu Bhino Ujas" that is set more than two decades after independent in early 1970s. Much better relief provided than the misery suffered during pre-independence period, this story vividly brings out the people's agonies in tragedy, inflicted by Government and manipulated by men – in Government and outside.

The paper ends with an appeal:

Those who are called upon to render public service whether in Government or voluntary sector would be well advised to read such stories to acquire sensitivity they need to render genuine service, with empathy for the people in distress, suffering in drought conditions particularly in the second year or third year, even if in a watershed village.

II Findings of impact of 2nd year of drought on watershed and non-watershed villages

Drinking Water

Table 1

	WSD Village	Non-WSD (Control) Village
Water available from existing bores	2	-
Old bores/ Common well repaired	1	-
Water supplied through tankers	2	3
Water supplied through pipelines	3	2
New private bore dug/ deepening of existing bores	-	2
Water brought from outside village	-	1

In the **first year** of drought (1999-2000), out of 16 WSD & control villages, 5 WSD villages out of 8 and only 1 out of 8 control villages did not face any problem of drinking water throughout the year.

In the **second year** of drought, all the villages faced drinking water problem with varied intensity. Out of eight WSD villages, 2 villages had moderate problem and water was available from the existing bores in agricultural fields, in 2 villages water was supplied through tankers and in 3 villages water was supplied through pipelines. It was noteworthy that the whole community participated in repairing the old existing well to augment water supply in 1 WSD village facing acute shortage of drinking water. No such collective and participatory initiatives were observed in the control villages. In 3 control villages water was supplied by tankers, 2 villages were supplied water through pipelines and in 1 village, people had to fetch water from nearby villages. In 2 control villages, people resorted to digging up new bores and deepening of the existing bores and wells.

Crop Season Table 2

	WSD vill.	Non-WSD vill
No Sowing	-	-
Crops in 3 seasons (Kharif, Rabi & Summer)	1	
Crops in 2 seasons (Kharif & Rabi)	2	1
Crops in 1 season (Kharif)	4	6
Sowing done, but complete crop failure	1	1

In the **first year** of drought (1999-2000), 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. 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.

In the **second year** of drought uncertain and scanty water availability have affected severely the crop sowing and yield. Out of 8 WSD villages, only in one WSD village farmers could take crops in 3 seasons whereas no control village was able to take crops in three seasons. In 4 WSD villages farmers were able to take Kharif crop and in 1 WSD village farmers were able to take Kharif & Rabi crops. In 1 WSD village the sowing was done but the crops completely failed. On the other hand, farmers of only 1 control village were able to take Kharif and Rabi crops and 6 control villages were only able to take Kharif crops. In 1 control village sowing was done but the crops completely failed.

Crop Area Table 3.

		WSD			Contro	
	Kharif	Rabi	Summer	Kharif	Rabi	Summer
Sown and failed	1	-	-	1	-	-
> 50% decrease	-	-	-	-	-	-
10-50% decrease	-	-	-	-	-	-
<10% decrease	-	-	-	1	-	-
No change	1	-	-	2	-	-
<10% increase	1	1	-	-	-	-
10-50% increase	1	-	1	-	-	-
50-100% increase	2	1	-	1	-	-
No sowing in 1 st year of drought, cropping in 2 nd	2	1	-	3	1	-
No sowing	-	5	7	-	7	8

* Details of crop area in the villages where there was no sowing in the 1st year of drought, but sowing done in the second year, taking advantage of freak rains in the second year of drought.

Watershed Village -

Name of village	1 st year	2 nd year
Bhupgarh	0	2ha. (Rabi)
Laiyari	0	520 ha. (Kharif)
Bhimgarh	0	950ha. (Kharif)

] Control Village –

Name of vill.	1 st year	2 nd year
Kalasar	0	900 ha. (Kharif)
Jaloya	0	1000 ha. (Kharif)
	0	62 ha. (Rabi)
Pisal	0	400 ha. (Kharif)

The findings of the **first year** revealed 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 were also **2** village where crop had failed totally. This was because there was very less rainfall in these village for two consecutive year.

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%. Discrepancy

In the **second year** of drought in Kharif season out of 8 WSD villages in 1 village sowing was done but the crops failed completely, in 1 village there was no change, in 1 village there was 10% increase, in 1 village there was 10-50% increase and in 2 villages there was 50-100% increase in crop area. In 2 watershed villages no sowing was done in the first year of drought but sowing was done in the second year of drought due to intermittent rains.

In Rabi season, out of 8 watershed villages, in 1 village there was increase up to 10% and in 1 village there was increase of 50-100% of crop area during. In 1 watershed village there was no sowing done during the Rabi season in the first year of drought but sowing done in the second year due to intermittent rains. In 5 watershed village there was no sowing done during the Rabi season.

In Summer season, out of 8-watershed village, only 1 village had done sowing in the summer season, where there was no sowing done in the first year of drought but sowing was done in the second year of drought. There was no sowing done in the rest 7 watershed villages.

Out of 8 control villages, during Kharif, in 1 village crop was sown but failed completely. In 1 village there was increase upto 10%, in 2 village there was no change and in 1 village there was 50-100% increase in the crop area due to moderate rainfall. In 3 control village no sowing was done in the Kharif season in the first year of drought but sowing was done in the second year of drought.

In Rabi season, out of 8 control village, in only 1village sowing was done, where there was no sowing done in the first year of drought but taking advantage of intermittent rains sowing was done in the second year.

No sowing was done in the summer season in the 8 control villages.

<u>Crop Yield</u> Table 4

	WSD village			Non-WSD village		
	Kharif	Rabi	Summer	Kharif	Rabi	Summer
Crop failure	1	-	-	1	-	-
1-100 kg /ha.	2	-	-	3	1	-
100- 500 kg/ ha.	3	1	-	2	-	-
500 – 1000 kg/ha.	1	1	-	-	-	-
> 1000 kg/ha.	1	1	-	2*	-	-

(the above table shows the yield of main crops; * the crop was used as fodder)

The impact on the yields was important to know the extent of the benefits from watershed programme. In the **first year** of drought, among **8** watershed villages, interestingly in **1** village there was increase in the yield. In **2** villages there are hardly any decrease both in kharif and rabi crop yield. There was 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.

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.

In the **second year** of drought, out of 8 WSD villages, in 1 village there was complete crop failure. During Kharif season, in 2 villages the yield was upto 100 kg/ha., in 3 villages the yield was between 100-500 kgs/ha., in 1 village the yield was above 1000 kgs/ha. During the Rabi season, in one village the yield was between 100-500 kgs/ha., in 1 village the yield was between 500 – 1000 kgs/ha. and in 1 village the yield was between 100-500 kgs/ha.

In control villages, during Kharif season - interestingly in 2 villages the yield was above 1000 kgs/ha. but the later on it could be utilised as fodder purpose only. IN one control village there was complete crop failure, in 3 villages the yield was upto 100 kg/ha., in 2 villages the yield was between 100-500 kgs/ha. During Rabi season, only in 1 control village crop could be raised but the yield was very poor about 100 kgs/ha.

Fodder Availability Table 5

	WSD	Non_WSD
Grass available from grassland	1	-
Special areas flagged for grass	1	-
Grass distributed	3	3
Grass bought from within the village	2	1
Grass bought from outside the village	1	4

During the **first year**, 2 watershed villages had no shortage of fodder and remaining 6 were facing fodder scarcity of varied intensity, whereas all the 8 control villages were facing acute fodder scarcity.

In the **second year** of drought all the 16 villages were facing fodder scarcity and were managing from various sources. Out of 8 WSD villages only 1 village bought fodder from outside the village and in 2 villages fodder was available for sale within the village, highlighting that atleast there were some families in such villages who were comfortable with the fodder availability with some surplus for sale. In 3 WSD villages, government brought fodder from outside and distributed on subsidised price. An interesting situation emerging from the study was that in 1 village people foresaw the deteriorating conditions and areas were earmarked specially for growing grass, again highlighting the situation of better water table and community action in watershed village. Also in one WSD village, fodder was available from the village grassland.

Cattle Population

Table 6.

	WSD	Non_WSD
No Decline	1	1
< 10% decrease	1	-
10-20% decrease	-	1
20-30% decrease	2	1
30-50% decrease	2	4
50-75% decrease	2	1

In the **first year** of drought, 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%.

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%.

The situation of animal population during continuing drought became grim in both the WSD and control villages in the **second year** of drought. The decreasing trend of cattle population observed in the first year of drought continued in the second year of drought.

In the second year of drought, 1 village saw cattle population further decrease upto 10%, 2 villages saw decrease between 21-30%, 2 villages saw decrease between 30-50% and 2 villages it decreased above 50%. In 1 village there was no appreciable change in the population of cattle.

In the 8 control villages, 1 village the decrease was between 10-20%, 1 village saw decrease between 20-30%, 4 villages saw decrease between 30-50% and in 1 village saw decrease more than 50%. In one village there was negligible change of cattle population.

Avg. yield (Lit./day)	WSD	non-WSD			
0 - 1.0	1	4			
1.1 - 2.0	6	2			
2.1 - 3.0	1	2			
3.1 - 4.0	-	-			
4.1 - 5.0	-	-			

Milk Yield of Cow

In the **second year** of drought, the average milk yield of cows had decreased in both the watershed and control villages. In 1 watershed village, the yield was 1 lit./day, in 6 villages the average yield was between 1-2 lit./day and in 1 village the average yield was between 2-3 lit./day.

Out of 8 control villages, in 4 villages the average milk yield was 1 lit. /day. In 2 villages the average yield was between 1-2 lit. day and in 2 villages the average milk yield was between 2-3 lit./day.

Milk Yield of Buffalo

Table 8.				
Average Milk Yield (Lit./day)	WSD	non-WSD		
0 - 1.0	2	-		
1.1 - 2.0	-	4		
2.1 - 3.0	3	3		
3.1 - 4.0	2	1		
4.1 - 5.0	1	-		

In the **second year** of drought, the average milk yield of buffaloes had decreased in both the Watershed and non-watershed villages. Out of 8 WSD village, the average milk yield was 1lit./day in 2 villages. The average milk was between 2-3 lit./day in 3 villages, 3-4 lit./day in 2 villages and 4-5lit./day in 1 watershed village.

In the control villages, the average milk yields of 4 villages were between 1-2 lit./day. In 3 villages, the milk yield was between 2-3 lit. /day and 3-4lit./day in 1 control villages.

Local Employment

	WSD	Non-WSD	
No Employment	2	6	
Low employment	2	2	
Satisfactory employment	4	-	
Good employment	-	-	

The study in the **first year** of drought revealed that 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 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.

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.

In the **second year** of drought, 4 WSD villages had still satisfactory employment, 2 villages had low employment and 2 villages with no employment. Out of 8 control villages, 6 villages had no employment and 2 villages had low employment.

Forced Migration

	WSD	Non-WSD	
No Mig.	-	-	
Low Mig. (3months)	-	-	
Moderate Migration (3-6 Months)	2	-	
High Migration (6-9 months)	5	4	
Very high migration (>9 months)	1	4	

The rate and period of migration in search of employment had markedly increased during the second year of drought. In the **first year** of drought there was no migration in atleast 2 WSD villages, but in the second year of drought all the 16 villages had witnessed migration but of varying intensity.

In the **second year** of drought there was one WSD village with very high migration, 5 WSD village witnessed high migration and 2 WSD village with a moderate level of migration. On the other hand, in 4 control villages there was high migration and 4-control villages very high migration.

Food Security

Table 11

	WSD	Non-WSD
No shortage	-	-
Low shortage (1-3 months)	2	-
Moderate shortage (3-6 months)	1	-
High shortage (6-9 months)	5	7
Very high shortage (>9 months)	-	1

The report on **first year** of drought highlights that WSD treatment had helped the villages to become self-sufficient in food grains. Among the 8 watershed villages, in the first year of drought, 1 village had no shortage, 5 villages had moderate shortage and 2 villages had low problem. However, in control villages during the drought the problem became acute in 1 village and moderately serious in other 7 villages.

The villages reeling under the severe drought in the **second year** too displayed the same advantage. Out of 8 Watershed village, 5 villages which were facing moderate shortage in the first year were facing high shortage, 1 village was facing moderate shortage and 2 villages facing low shortage. Out of 8 control villages, 7 villages which were facing moderate shortage in the first year of drought were facing high shortage of food grain. And 1 village was facing very high shortage of food security.

III Policy Implications

In the study 'Eloquent Silent Revolution' we had drawn out policy implications of the findings of the study. In this sequel study we like to repeat and reiterate our recommendations;

Intensive Watershed

The sequel study has found that the advantage enjoyed by watershed villages as compared to non-watershed villages dwindled as the drought condition persisted in the 2^{nd} year. We are not sure if the full potential for water conservation could be developed in the current scheme of watershed development of Ministry of Rural Development (MoRD). It is necessary to examine if more intensive investment and measures are needed to ensure security of water, fodder and food grains when the drought persists in the 2^{nd} year. There are villages that have gone beyond the investment envisaged in the MoRD's watershed scheme and were better placed to face persistent drought. Such villages should be identified and studied to find out :

- 1. the specific measures taken to ensure reliable supply of water
- 2. additional investment made over and above permissible under MoRD's scheme Rs.4000/ ha. (raised to Rs.6000 / ha. from 2001). When investment in excess of Rs.1,00,000/ha is made to provide water in public irrigation projects, the policy makers should not grudge raising the limits for investment in developing local water resources if that would contribute to drought proofing. It was pointed out in the earlier study that to the extent drought proofing is achieved, Government stands to benefit in providing relief to the drought affected villages water, fodder, employment etc.
- 3. the consequences for the downstream villages when there is more thorough rainwater harvesting in the villages upstream.

Watershed Plus

To realise higher gains of the potential created during watershed development, requires several initiatives and measures by way of extension and linkages to resources of knowledge, credit, marketing etc. Known as 'Watershed Plus', such measures will enhance the food security and availability of fodder as well as opportunity for gainful employment and overall improvement in income and wellbeing.

Drinking water

The male dominated decision making in the watershed villages has given priority to rain water harvesting that aimed at raising the water table of the irrigation wells. Importance of ensuring steady supply of drinking water has not been a priority of the planning process of the watershed development. This has to change. In fact there is need to ensure that the wells that provide drinking water are protected from the fall of water table by the impact of over-drawl of water in the neighboring irrigation wells. It will be extremely useful if a scheme could be drawn up which would require the village community to decide how it would protect the drinking water supply by regulating the drawl of water from the neighboring irrigation wells. It may become necessary to compensate the owners of such irrigation wells but that would be a small price to pay as compared to the sufferings of shortage or non-availability of drinking water. Maharashtra government has already drawn up such a scheme that empowers the Collectors to prohibit drawl of water from neighboring wells in the event of impending scarcity. We would rather prefer that the local community considers this issue and takes appropriate decision, may be under an enabling government scheme of assistance- administratively and financially.

Fodder supply

The earlier study had reported that sufficient attention had not been given to ensure steady supply of fodder and grasses in lean years. Only in three out of 8 watershed villages an attempt was made to develop grasses in public lands but without much success. We had recommended that in the very planning of watershed there is need to give due consideration to raising of crops that will provides security of food as well as fodder.

In this sequel study we would like to recommend setting up of fodder banks by storing grass that is surplus during a good year. This has been talked about for a long time but there are few examples of success in establishing food grain banks and / or fodder banks. There is need to locate villages where such initiatives have been taken satisfactorily and drawing lessons from them to develop schemes that should be part of the watershed development programme.

Employment and Scarcity relief

When we found that watershed development not only benefited the local community but also government which has the responsibility for arranging and funding the supply of drinking water, fodder and employment, we recommend that watershed development approach and systems need to be adopted by undertaking works programme that would be more productive and in a way would contributes towards drought proofing. The author of this report has been working on this suggestion for two years without much success. For a number of decades the same approach and methodology of starting works in ad-hoc manner for providing employment has been going on and therefore both district administration and the state administration have got used to it . May be this ad-hoc employment programme fits in with the needs of the local political leaders and public officials. The effort to change by incorporating the watershed principles in the planning and management of relief works has to be continued with persistence and greater vigour.

V Survival Struggle during drought

During the data collection for the study of impact of drought on in the earlier and present study in watershed and non-watershed villages, an attempt was made to collect information and acquire understanding of how people manage to cope with the severity of continuing drought conditions. Outside agencies, Governmental and non-Governmental, deliver their services at the village level and sometimes extend it to destitute families. It is very rare that understanding is obtained and concern expressed about how within the home, amongst the members of the family – men, women, children and even animals have to struggle to conserve their resources and make sacrifices for the sole purpose of surviving the drought period. This is only qualitative information, as expressed by people and observed by the field investigators.

Economic impact

i) Farmers are doubly hit. The investment they have made in preparing the land, sowing seeds and fertilizers and labour for farming do not give return, and sometimes totally wasted. If they have taken loan for making the investment, the farmers sink in debt. They would not be able to repay the loan and therefore next year they may not be entitled to apply for fresh loan for making investment and meanwhile the meter of interest charge rolls on.

ii) Those who have already incurred debt and cannot get fresh loan from institutions or from shopkeepers have to mortgage or sell their valuables like gold, silver ornaments, large utensils and if desperate even mortgage land and sell animals at distress price. Those who have taken loan during the previous year of drought and paid at least interest, can avail of loan during the 2nd year from institutions and the shopkeepers. Such loan would be available at 12-15% interest. Shopkeepers of course will be charging more.

iii) The shepherds groups who live only on animals, face more problems. There will be hardly any grass on the common lands and therefore large animals they maintain will have to be sold at distress price as they have no money for purchase of even subsidized grass. They do not have resources to draw upon for buying such grass. Since shepherds are averse to hard work like digging and carrying head loads of earth, the most common solution resorted to is to migrate with left over surviving animals to areas where there is more greenery such as south Gujarat.

iv) The landless families hardly get any work in agriculture operations and therefore have to wait until Government starts the relief works for employment. However Government puts limit on number of members of a family who can work on relief employment. Many of them migrate.

Animals

The livestock owners face very embarrassing problem. Bullocks that are the most precious animals for the farmers, have hardly any service to render in absence of agriculture operations during drought. Feeding them becomes very difficult. They are underfed and then farmers resort to distress sale. Among milch animals buffaloes that consume more grass are sold first. Livestock owners try to retain a cow that gives small amount of milk for the children and for making tea.

The animals that are not sold are not properly fed and not provided water for drinking. In place of 2-3 times a day, animals are taken for drinking water once in a day. Water cannot be wasted on cleaning them. Underfed, not even enough water to drink, animals lose weight and become less productive. They become more miserable than their masters. Many die quietly.

Instead of good mix of green and dry fodder, during drought conditions animals that are retained are fed only dry fodder which the drought affected villages have to buy from outside. The cheapest and less nutritive is wheat straw that during 2001 was sold at Rs.20 to 30 per 20 kg. The most preferred was groundnut leaves that were sold at Rs.100 per 20 kg. Those who can afford would try to buy jowar and bajra straws sold at Rs.60 to 80 per 20 kg. When the Government starts supplying grass brought usually from south Gujarat, that is a real boon to the animal owners as Government supplies grass at Rs.20 per 20 kgs. Of course not all that villagers need for their animals but subsidized small quantities is preferred than buying in the open market.

<u>Health</u>

During drought with drastically reduced income the health and hygiene standards were very much compromised.

- i) Instead of daily bath, only washing hands and feet would do, regular bath at interval of days. No fresh washed clothes to put on everyday, only when bath is taken clothes are changed even though they may be dirty and stinking.
- ii) Water is used sparingly in washing utensils. They do not pass through several washes. The utensils are first cleansed by using the earth, then cleaned with water but this water is not thrown away. It is kept aside for the dirt to settle so that the same water can be used again and again for cleaning utensils and if the family has got lavatory for using it for flushing. However since flushing requires more water, such families revert to their earlier practice of going out in the field for defecation.
- iii) The food intake is reduced in quantity and quality. Not the luxury of 3 meals a day. 2 meals even one meal will do. The meal does not have all the regular items of vegetables, milk, ghee etc. It is paltry meal Khichdi and potato curry. Even tea taking is reduced.
- iv) Under stress and working hard on employment works, usually during very hot part of the day, the villagers fall more sick than during normal

years.. However they do not rush the sick members to good doctors. They first try homely treatment, grandmother's medicines. When that does not work the patients are taken not to a reputed private doctor but to Government dispensaries where they do not have to pay the fees. They do not buy all the medicines prescribed by the doctor. They buy what they can afford and hope they would work.

v) It was reported in 2 out of 16 study villages that to overcome depression, people took to the last resort, drinking.

<u>Social</u>

- i) Survival being the first concern, the leftover food is not fed to the stray dogs of the street, it is kept aside for the next meal.
- ii) Workload of women increases. Over and above household duties of the normal time during the morning and evening, women have to join the men folk for full day work on the relief works.
- iii) There is drastic cut on expenditure on social occasions. With prosperity in rural areas, marriages had become the occasion for displaying new wealth fire works, entertaining the guests for several meals, expensive gifts for the bride. During the drought, the event becomes simple and symbolic; gifts to marrying couple reduced in value not the usual of 20 GMS of gold, few new clothes and for the other members of the family even secondhand clothes. Some villages have also organized group marriages, sharing expenses that are even otherwise reduced in scale.
- iv) Reduced visits to friends and relatives in other villages even on social occasions.
- v) Even though children are accorded priority in consumption of food, the grown up children if they are studying in nearby towns living in hostels they are called back. If they are living in their own village, they go to school by bus. If there is further distress and need, children are called upon to contribute to income by working on wages rather than attending the school.
- vi) Like others in the family, the trees also suffer because they are not watered regularly.
- vii) Though no increase in theft is reported, there is more tension within the family, more quarrels and divisions in the family. The good consequence is that some families have realized the benefit of limiting its size by adopting family planning methods.

Role of Public Services

With reduced resources to buy private goods and services, even though they may be better in quality, people fall back on public services, even though the quality of service may be poor.

i) Employment on relief work

- ii) Supply of subsidized grass and subsidized cattle camps where animals can be kept..
- iii) Government dispensaries they do not charge fees compared to private clinics and hospitals.
- iv) Availability of loan from banks and cooperatives at reasonable rate of interest as compared to the rates of loan from private sources.

All these public services become crucial helping the people to cope with and surviving in the delibilitating drought conditions. How ample these services are and the quality of the services specially expressed as concern for the people in distress, become extremely important. Need for more vigilance on the part of Government at higher level, public leaders and voluntary sector to see that such services are as efficient as possible.

Role of voluntary sector

The relief activities of voluntary sector are usually provided either as regular services through running of health and education institutions or rescue operations during floods and cyclones, earthquake. There is need for similar services during drought conditions where people become extremely vulnerable, more so because the need for relief may be so widespread that public agencies with the best of their efforts may not be able to reach each and every village and family needing the services. The voluntary sector engaged in health and family welfare activities need to make an effort to reach out to the poor and those who are known to be more vulnerable in a village. They can also help in promoting the idea of reducing the expenditure on social events such as marriage and death.

The voluntary agencies can almost promote innovative ideas of drought proofing such as protecting drinking water, food grain and fodder bank etc. These are discussed in the section-III on policy issues.

VI Sensitisation

Drought conditions occurring regularly in drought prone areas are taking heavy toll of economic and social life of the people. The specter of drought and famine shakes the self-confidence of the village communities, the poor in particular, feel uncertain about their capacity to survive one more drought. An attempt made here to present field investigations cannot bring out prolonged physical wretchedness and mental agony through which the whole community has to pass until not the next rains but the next harvest. Only creative writers who can delve into the minds of the people – men, women, children, farmers and landless families, the shepherd community, can vividly portray how drought impacts the inner core of the life of the village community. The author of this paper is reminded of two such novels in Gujarati that describe in detail the misery of life through which people have to struggle for survival. 'Manvini Bhavai*''² – by Pannalal Patel is set in North Gujarat at the turn of the nineteenth century when the country, Gujarat in particular, passed through a famine that took heavy toll of men and animals. The year of 1900, known in Gujarati as 'Chhapanio'' is etched in Gujarat's undying memory as the worst natural tragedy the area had suffered. The novel that won the Gnanpith award for Pannalal Patel narrates the story of a village that is subjected to relentless torment of waterless years that dehumanized most people throwing to the winds the norms of personal conduct and social behaviour. The novel also tells the story of how a few like the main characters Kalu and Raju battled through the critical years to keep up courage, morale and preserve human dignity. Its reading is heart-rending and at the same time elevates spirit and faith in human capacity for endurance. (Box 1)

The second novel "Ansu Bhino Ujas", means "The glow moisted by tears" by Dilip Ranpura is set more than two decades after independence in early 1970s. The years 1971-72 inflicted sever drought conditions on Saurashtra that is very drought prone. This story shows how Government of independent India had now a plan to come to rescue of people suffering acute scarcity of water, food, and employment. Much better than the misery suffered during pre-independence period as depicted in the earlier novel, this story vividly brings out people's agonies in tragedy, inflicted by nature and manipulated by men – in Government and outside. (Box 2)

Those who are called upon to render public service whether in Government or voluntary sector would be well advised to read such stories to acquire sensitivity they need to render genuine service, with empathy for the people in distress, suffering in drought conditions particularly in the second year or third year, even if in a watershed village.

 $^{^2}$ Translated in English 'Endurance" by V Y Kantak, published by Sahitya Academy 1995 – pages 428. Price Rs.270/- .

<u>Box -1</u>

Excerpts from the novel 'Manvini Bhavai' – (English - 'Endurance') by Pannalal Patel

Misery of survival

There is still a month to go for any hope of rain. The whole of June is still ahead ! It felt like an entire age to be passed. Living through each single day- passing time minute by minute – was difficult, what to speak of a whole month consisting of one score and ten days!

Till now only the first 'one-time' meal was being cooked. Not that there was much to cook. It was just a sort of gruel that was cooked not in butter-milk – which was possible to encounter only in dream – but in plain water. To which were added some pieces of edible barks of trees to give it body and substance. After all, the stomach needs to be made feel weighted for better assurance!

Driven by the same craving, Kalu roamed through the lanes and alleys of Degadia town asking at every door, 'Give me some work, sister. And for the work give me just one rotli...dash it, even one mouthful of rice would be ample...."

One thing was certain. In these trying days Man had become a stranger to humanness. He had abandoned all restraint...Side by side he had put away, shelved, all notions of honor, integrity, self – respect...And of course, religion and compassion had been relegated to the precincts of the temple dedicated to the 'flute -player' God! One thing alone remained the all-absorbing pre-occupation: In any manner possible, fill one's stomach and allay the pangs of hunger. The paramount question was, 'Could one keep alive? How?' That was the one thought that possessed them, made them frantic-drove them to exertion with an unbearable craving. That's how town Degadia's lanes were full of those thousands of human beings roaming about like dogs.

In some places, one even witnessed dogs and humans engaged in a tug-of-war over a piece of *rotli*. Everywhere there was this incongruous situation- the provider of grain himself was now reduced to ravenously snatching at what was of his own giving!

In the jungles, in the fields, in the bazaars, in the streets- wherever one turned one came across dead bodies. Cremating or burying them had itself become a problem. There was hardly scope even for lament or condolence! It was as though the 'drought year" was being deliberately extended to continue the famine conditions. The July sky was absolutely clear, spread out like flat, barren, fields totally devoid of the slightest signs of either humans or cattle or vegetation. Up to the farthest horizon one couldn't spot out anything like a single hint of cloud.

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At the beginning, not many turned up to take what was given as charity. But day by day that number went on increasing. Hunger eroded the self-respect of the most unyielding, made even the upright stumble!

Kalu who was lying down like an inert lump was forced to become active and get up. On Kalu's eyes, deep sunken in their sockets and the jawbone sticking out of his face, something like a smile flickered. And he asked, "This one-and-a-half quarter seer of *khichdee* will keep us alive? Oh, no. Even if they make it two seers I can't have my fill." Walking ahead he went on, "And you imagine it is going to rain, is it? This is the end of our earth-time of universal destruction, you wretch! No one is going to remain alive-no, not us, and not any of those tradesmen either! Why then, at this moment of death, are you compelling this son of a farmer to hold out his hand to beg? Leave me alone."

Kalu resisted when he was asked to stand in line, 'But I don't want to eat what is given in charity. I don't want any dole."

When he was mocked that he was behaving like a '*laat sahaab*,' he tensed up and said, 'If I were a *laat sahaab* I would have taken it, because I am a farmer I won't. Here I stand. How we feel seeing these heaps of grain in front of us that we ourselves had grown with our sweat?" But before he could complete the sentence a sob burst out from him and cut it off. And he broke down sobbing and crying bitterly....

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"No.I too had thought hunger was the worst, the greatest curse. But today I have found something else that is even worse than that". Looking up the small bundle at a loose-end of his *dhoti* in which he had tied up the *khichdee*, *Kalu* said, "Worse than hunger and more terrible, is begging. Hunger melts down our flesh and bones, but this begging, it dissipates our pride, even our very souls....turns everything to water...reduces us to nullity."

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People looked up and seeing July skies bare and arid, sighed. Day after day as the month advanced, they lost hope of rain, and side by side, their hopes of survival too gave way. Like fragile bubbles breaking they began to die one after another in quick succession. Those left behind yearned for release imploring God, 'We can no longer endure this hunger. Give us death. There's no dearth of that at least? Do grant us one thing, O God! Either send us rain or give us death. We ask no more..."

Box:2

Smallpox as Savior

Mohan of village Morsal is dejected when he learns that the son's sickness is not "All hopes are dashed. I was expecting the diagnosis of due to smallpox. smallpox which will bring me reward of one thousand rupees, that will help us in surviving through the drought and enable us to bring up the young Ravala like a prince". * *

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"What is rain like?"

'My daughter was born during Diwali holidays, so we named her 'Diwali'. She had heard people talking about rains, so when she learnt to speak, Diwali asked me, 'Mother, what is rain like?' It never rained, and the girl continued to demand to show her how does it look when it rains. I was feeling the pang. My first child, this daughter born during drought would not enjoy any bliss, but won't see even the raindrops falling from the sky? I brought a pitcher of water from the neighbour, sprinkled before Diwali's eyes and cried, 'Look Diwali, this is how it looks when it rains'. Diwali looked at falling drops with excitement and then passed away quietly".

From the novel 'Ansu Bhino Ujas" by Dilip Ranpura, translated for this paper by Anil Shah

Annexure-1

Study Area - Project Implementing Agencies & villages

- a) Development Support Centre, Dhari, Amreli
 a.1 Village-Khicha, (watershed village)
 a.2 Village- Virpur, (control village)
- b) GRISERVE (BAIF), Jasdan, Rajkot
 b.1 Village-Bhupgarh, (watershed village)
 b.2 Village- Ramadiya, (control village)
- c) Gramya Vikas Trust, Dwarka, Jamnagar
 c.1 Village-Lourali, (watershed village)
 c.2 Village- Kuranga, (control village)
- d) M G Patel Sarvodaya Ashra, Amirgarh, Banaskantha d.1 Village- Padan, (watershed village)
 d.2 Village- Jaloya, (control village)
- e) Shri Kundla Gram Seva Mandal, Savar Kundla
 e.1 Village- Dedakdi, (watershed village)
 e.2 Village- Thordi, (control village)
- f) ANARDE Foundation
 f.1 Village- Kanera, (watershed village)
 f.2 Village- Pisal, (control village)
- g) Sahjeevan, Bhuj, Kachcch
 g.1 Village- Laiyari, (watershed village)
 g.2 Village- Tal, (control village)
- h) Gujarat Land Development Corporation (GLDC), Surendranagar
 h.1 Village- Bhimgarh (watershed village)
 h.2 Village- Kalasar (control village)