Table 41: Soil Conservation Relief Works in Rajasthan, July, 1987 to July, 1988

S.No.	Work	Number of Works					Amount Require for completion of these works (Rs. in lakh)		
		Started.	Com-pleted	Dropp-ed	Sanc-tioned under other schem-es.	Re-mained incom-plete	Labour	Material	Total
1.	Watershed	42	11	..	..	31	23.82	1.77	25.59
2.	*Anicuts*	134	95	1	3	35	12.18	13.30	25.48
3.	*Khadins*	272	142	5	7	118	43.45	9.76	53.21
4.	Pasture Development	112	81	..	1	30	11.05	0.92	11.97
5.	*Nalla Bunding*	38	16	..	1	21	8.74	2.66	11.40
6.	Contour *Bunding*	7	7	..	..	..	..	..	..
7.	Spurs	3	..	..	..	3	0.51	0.04	0.55
8.	Diversion Channels	8	7	..	..	1	0.28	0.01	0.29
9.	Farm Ponds	13	11	..	1	1	0.20	0.10	0.30
10.	Waste Land Development Works	3	3	..	..	..	..	..	..
11.	Feeder Channels	1	1	..	..	..	..	..	..
12.	Desilting of Tanks	24	23	..	..	1	0.25	..	0.25
	Total	657	397	6	13	241	100.48	28.56	129.04

The process of sanctioning of posts, recruitment of incumbents and their joining the job took considerable time. The posts of supervisory staff should be sanctioned in advance based on likely number of labourers to be employed.

3.31 Mates responsible for maintaining mate measurement books and visit book were not literate enough. It was difficult for them to fill all the entries and maintain the record. It is suggested that training should be imparted to mates before they are engaged on works. District level employment exchanges should also maintain the list of trained mates.

3.32 The drought relief works were closed abruptly at the time when progress on works was at peak level, causing difficulty in maintenance and finalisation of accounts. Supervisory staff should be continued at least for two months after the closure of works. Irrigation department did not look after the maintenance of works irrigating less than 50 acre. Works irrigating less than 50 acre should be taken over by *Panchayat Samities* even if such works are executed by the Irrigation Department with a view to provide employment to drought affected population.

3.33 At a short notice large number of works were to be started and therefore, it was necessary that surveys and estimates should be ready well in advance. It was proposed that some staff should be deputed in every circle to carry out surveys and preparation of estimates of minor and small works to be taken up during drought years in advance. Such staff could be utilised to start the famine works in initial stage. This would help in taking up only useful works with correct estimates and designs which would give optimum utilisation of the expenditure incurred on drought relief works.

3.34 Rajasthan will continue to face droughts as the ultimate irrigation potential which can be developed in State from all sources will only be sufficient to irrigate two-fifth of the area under cultivation, which was likely to be 1,500 million hectare. In the start of next century, the State's three-fifth of area has to depend on the monsoon which is very erratic and lowest compared to other States of the country. The scarcity conditions in the State in atleast 2 years out of 5 years are

therefore unavoidable. The incomplete drought relief works should be taken under other special schemes like DPAP/DDP/NREP/RLEGP etc. so as to get maximum benefit out of the money spent on relief works.

3.35 The relief machinery in the field comes into existence only when relief operations are started. This results in inadequate preparations. It is essential that some field staff for survey and preparation of estimates is provided to the DCs in advance. This can be done by the State Government and expenditure on this can be charged to the margin money. This single measure can further improve the quality of work.

3.36 The relief operations come to an end abruptly on a given date. This results in large number of works remaining incomplete and the works completed are not maintained in any manner. Consequently the damage is caused to works of forestry nature where maintenance for the first three years is necessary. Funds should be provided for guarding and watering of trees even after closure of relief operations. Similar treatment is required for pastures also.

3.37 Hitherto only community works have been taken up as a drought relief employment generation activity. This may have had its own relevance and advantage but time has come when the emphasis may change from community works to individual beneficiary works. As providing employment is the first requisite of relief operations it becomes necessary that employment generation works are taken up in almost every *Panchayat* affected by drought. This has to be done just to provide employment within a reasonable distance from one's place of living. This compels opening of adequate number of works in each *Panchayat*, many a times, in more than one village of the same *Panchayat*. Even if there are not worth while community works, still these are taken up. This results in large number of earthen road works and works of deepening of village ponds *(nadis)*. In itself deepening of village ponds is not useless activity but deepening the same *nadi* year after year leads to infructuous expenditure and may result in malpractices.

3.38 The experience of last two drought relief operations in 1987 and 1988 have proved that whenever community works of useful and drought-proofing nature are not available, individual beneficiary works may be taken up. The experience suggests that the latter may be preferred. In 1987 and much more in 1988, a large number of irrigation wells, *tankas* and rural house works were taken up. The advantages from this approach are as follows:

(i) The requirement for material component becomes zero as the wage component is borne by the Government and individual receiving the benefit bears the material component;

(ii) The requirement for supervision and control is reduced to minimum as individual beneficiary himself supervises the labourers and marks their attendance in the muster rolls;

(iii) Manipulation of attendance in muster rolls and measurements is ruled out. This becomes unnecessary as the total wage component available for a well or a *tanka* or a house is fixed and is related to the progress of the construction;

(iv) The maintenance requirement of these works after their completion is zero for the Government.

(v) The wells and the *tankas* are directly of drought proofing nature. Anybody who gets a well or a *tanka* is in a better position to withstand future drought;

(vi) The benefit can easily be directed towards weaker sections, thereby making the programme equity — oriented;

(vii) Increased national productivity by way of increased irrigation/agricultural produce accrues; and

(viii) It attacks poverty directly. Wastage of public funds is ruled out. Dispersal of labour deployment can be achieved as per desired pattern. It takes care of a number of facilities such as drinking water, shades, and creches for the labourers.

Water Supply

4.1 There was an acute drinking water problem in Rajasthan which was compounded by unprecedented drought for fourth consecutive year. Normally in the past, the drought occurred due to

Figure 17: Monthwise position of work sanctioned and work started in Rajasthan July'87 to July'88.

improper spacing of the rainfall but in 1987-88, it was not the improper spacing or uneven nature of the monsoon but it was due to the total failure of the monsoon.

4.2 The normal rainfall in western part of the State which is covered by Thar Desert, varied between 5 centimetre to 12.5 centimetre. In most of this part in 1987-88 there was no rainfall at all. The depth of ground water in many parts of the State varied between 80 to 140 metre. During last four years of drought with hardly any recharging of ground water acquifer, the water level went down by 20 metre. With the result that large number of wells either dried up or had substantially reduced water column or became brackish. Water tanks also were either empty or had little water.

4.3 There are 32,530 identified problem villages out of total 34,968 villages (as per 1981 census) in Rajasthan. Even after great efforts and substantial investment over last several years, 6,234 villages continued to be problem as on 1st April, 1988 for want of safe and potable water supply facilities. Leave alone the settlements not so far covered with safe drinking water sources, the villages with normal drinking water facilities in normal times also faced crisis due to depletion of water table.

4.4 The problem of drinking water was acute in a number of towns but critical particularly in the cities such as Ajmer, Beawar, Kishangarh, Jodhpur, Udaipur, Bhilwara, Mount Abu, Deeg and Pali. People of Ajmer city (population 5 lakh) were hardly getting water once in 3 days. Beawar and Kishangarh towns were in even worse condition. Udaipur, known as the city of lakes, faced such a water crisis that when the monsoon in 1988 was normal, water was supplied once in two days. Jodhpur with big cantonment, too faced serious water problem. Supply of water was restricted there also to once in 2 days. In Pali and Bhilwara water was given once in 2 days. Bharatpur and Deeg though in the Eastern Rajasthan, also faced similar crisis.

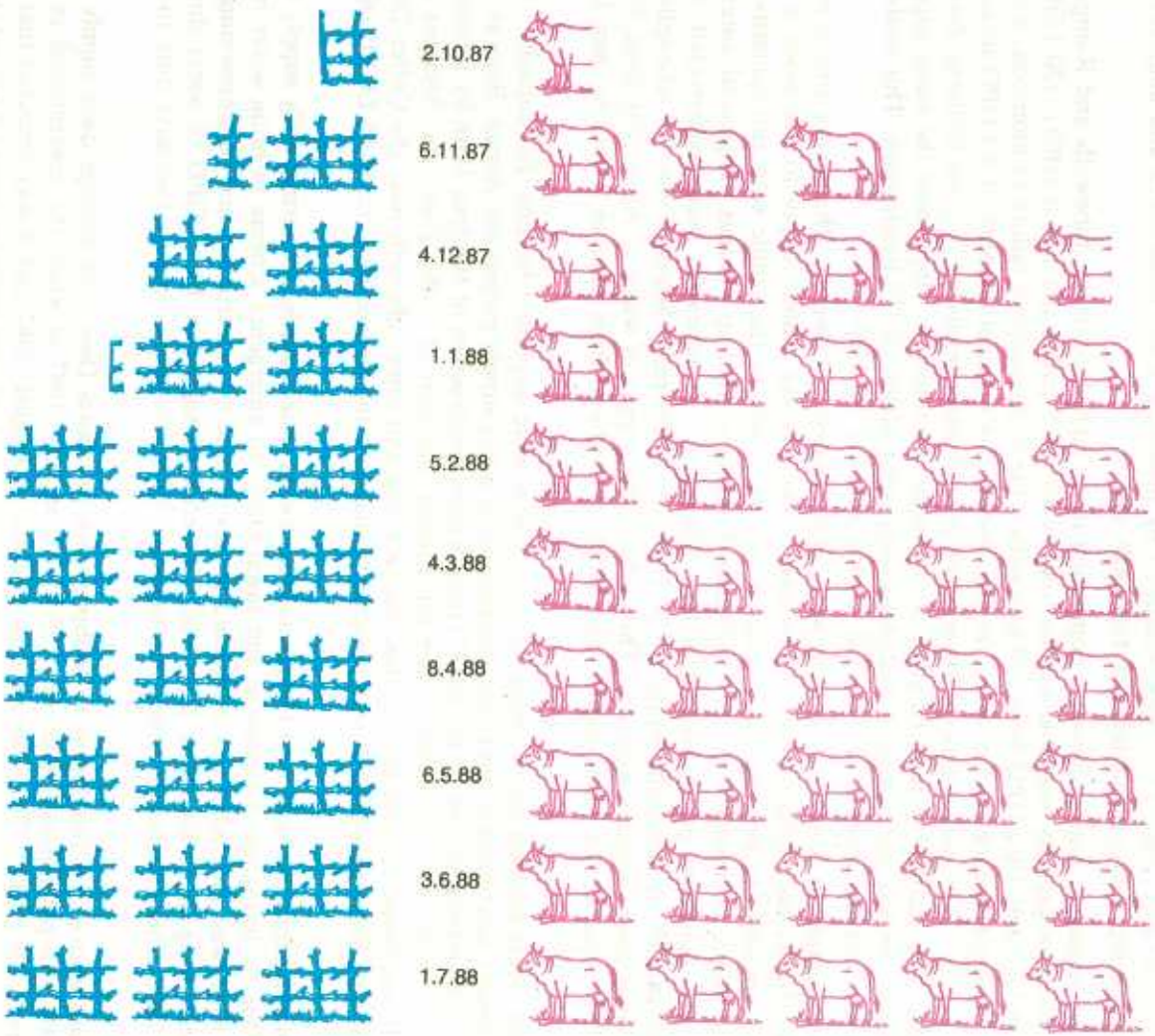
4.5 The State Government realised the grimness of the situation in August, 1987 and prepared a contingency plan from August, 1987 to July, 1988 to cover 6,570 villages by providing additional handpumps, augmentation of water supply and transportation of water through tankers at a cost of Rs. 62 crore in rural sector and benefiting 146 towns by providing new handpumps and augmenting water supply schemes at a cost of Rs. 58 crore in urban sector. The position was reviewed in November, 1987 and proposals for allocation of additional funds required during August, 1987 to March 1988 and April, 1988 to July, 1988 were prepared for Rs. 37.08 crore and 24.89 crore respectively for urban sector and submitted to the GOI.

4.6 Again in March, 1988 it became necessary to review the overall position due to failure of winter rains. Then a supplementary memorandum was prepared and submitted to cover 2,236 villages through augmentation schemes and providing new handpumps at a cost of Rs. 16.44 crore in rural sector and benefiting 117 towns by augmenting schemes and providing new handpumps at a cost of Rs. 30.58 crore in urban sector.

4.7 Installation of handpumps in villages where all existing handpumps went dry so as to keep at least one handpump in working order was undertaken. Space imageries were also used in finalisation of sites for borewells. Water was brought from distance sources through pipe line, where no local source was available. Boring was done in existing open wells or they were deepened to increase water column/yield. In extreme cases water was transported by truck/tractor, tankers, and camel carts. Broadly an attempt was made to maintain a minimum service level of water supply. Local water sources were exploited to the maximum possible extent by constructing handpumps/low cost duty tubewells and utilising unused wells. Water supply from nearest possible ground water source/surface water source through pipe line was arranged. Spraying Cetyl Alcohol for reducing evaporation losses from surface water sources was undertaken. Transportation of water through road/rail tankers was also undertaken.

4.8 The GOI provided a sum of Rs. 25 crore and Rs. 19.68 crore through two different sanctions for 1987-88 (August 1987 to March, 1988). A sum of Rs. 25. 238 crore was also made available by the GOI for the period from April, 1988 to July, 1988.

4.9 Most of the drilling work in the State was done by the Public Health Engineering Departments (PHED) and Ground Water Department. The PHED had 113 different type of drilling rigs having capacity to drill 506 points for tube wells and 5700 points for handpumps annually. Looking to the increasing workload of the drilling, indent for purchase of another 13 drilling rigs (7 DTH, 5 Rotary



LEGEND

Each Symbol Represents 200 Cattle Camps

Each Symbol Represents 1 lakh Cattle

Figure 18 : Cattle in Cattle Camps in Rajasthan, Oct. 1987 to July 1988

and 2 Combination) with other equipments were placed on Director General of Supply and Disposal (DGS&D). For this the GOI provided Rs. 4.25 crore in 1987-88

4.10 From August, 1987 to March, 1988 5,512 villages benefitted by providing 5,750 handpumps and augmentation of water supply through 285 tubewells etc. A sum of Rs 11.74 crore was spent on these works. In addition, water supply arrangement in 1,058 villages were also made through tankers. Wells of 675 villages under *Piwai* system were deepened.

4.11 From April to July 1988, 2,293 villages benefitted through 3,676 handpumps, 207 tubewells and 217 open wells etc. In addition to this, water supply arrangement in 500 commissioned villages were made through tankers as the source of water of these villages dried up. A sum of Rs. 16.44 crore was spent on these works.

4.12 From August 1987 to March 1988, 42 towns benefitted including some major cities like Ajmer, Jaipur, Jodhpur, Pali and Udaipur by providing new handpumps and augmentation of water supply scheme through tubewells etc. An expenditure of Rs. 25 crore was incurred on these items.

4.13 From April to July 1988, 117 towns benefitted by providing 1,991 handpumps and augmenting water supply schemes by constructing 225 tubewells etc.

4.14 The water supply to Jaipur, having a population of 12 lakh depends on tubewells and Ramgarh lake. The production capacity available for the town is 470 lakh gallon per day (LGPD), 120 LGPD from Ramgarh lake and 350 LGPD from 370 tubewells. Due to consecutive failure of monsoon, water level in lake depleted to rock-bottom level, forcing drawal of a nominal quantity of 5 LGPD to keep the system running. There was a general lowering of ground water level due to poor recharge during past four years. This resulted in reduced yield of tubewells. Therefore to supplement the water supply 30 tubewells were drilled and commissioned along with construction of 150 handpumps. This enabled in maintaining a service level of 370 LGPD during summer of 1988.

4.15 The water supply to Ajmer city is from well fields situated at Ganehra, Bhaonwata and at bed/ bank of river Banas and surface sour of Foyasagar. The average water supply to the town is 70 LGPD. It was possible to provide water once in two days only to the public with this quantity of water. Due to failure of monsoon in 1987, surface of Foyasagar dried up whereas the ground water in Bhaonwata and Ganhera got heavily depleted. Therefore, 20 tubewells were constructed and commissioned in 1987 to maintain supply level. However in February-March, 1988, 18 tubewells in the bed of Banas river suddenly went dry. This reduced the supply of water to Ajmer city from 70 to 50 LGPD. The frequency of water supply thus had to be reduced from once in 2 days to once in 3 days.

4.16 The well fields situated on bed/bank of river Banas were exploited to their full capacity. The State Government sanctioned a composite reorganisation water supply project for Ajmer, Beawar and Kishangarh at an estimated cost of Rs. 64.37 crore besides construction of Bisalpur Dam by Irrigation Department at a cost of Rs. 52 crore. Under this project, one part of Coffer Dam near Bisalpur was completed. It was found feasible to construct one jack well and some tubewells near the Coffer Dam. By commissioning these proposals it was possible to maintain the service level to 60-65 LGPD of 70 LGPD.

4.17 Pali town depends on Jawai and Hemawas Dam for its water supply. Its normal daily supply was 25 LGPD. Due to drying up of Hemawas and Jawai Dam, an emergency scheme to bring water from Bhomadra, Khetawas and Jadan was completed in record time by constructing and commissioning 26 tubewells and laying in 32 kilometre pipe line. This enabled supply of 10.5 LGPD of water during summer of 1988. This quantity of water was sufficient to make supply once in two days only to the public.

4.18 The main source of water supply to Jodhpur town was Jawai Dam. The average daily supply for Jodhpur town with population 7 lakh was 170 LGPD in July, 1987 in which the contribution of the Jawai Dam was 120 LGPD. The situation was assessed in August, 1987 and it was expected that the water in Jawai Dam would not last long. Therefore, following four augmentation works were taken up on emergency basis.

a) Augmentation of Rampura well field: Rampura well-field is one of the sources of water supply to Jodhpur Dam and had the production capacity of 25 LGPD through tubewells. Another 15

tubewells were constructed under emergency scheme to augment the supply of 40 LGPD.

b) Augmentation of Pal well field: The production capacity of Pal well field was 5 LGPD. By constructing additional tubewells its capacity was increased to 7 5 LGPD.

c) Emergency Scheme Tiwari-Panchla: A new well field was developed in Tiwari Panchla Balarwa area, 45 kilometre away from Jodhpur by constructing 27 tubewells to bring 30 LGPD of water to Jodhpur town.

d) Emergency Scheme Ransigaon: 8 new tubewells were constructed and commissioned near Ransigaon 85 kilometre away from Jodhpur. This scheme was commissioned to bring 20 LGPD of water to Jodhpur town. In addition to above, transportation of water through rail and truck tankers was undertaken to supply water upto 8 LGPD. 1100 handpumps were provided in the town to meet the need of severely affected localities.

4.19 All these augmentation works of water supply made it possible to supply 125 LGPD of water in summer of 1988 to Jodhpur town even when the supply of water from the surface sources became nil. Even with such massive efforts, it was possible to supply water once in 48 hours only to the public.

4.20 **Udaipur:** The main source of Udaipur water supply scheme is Pichhola and Fatehsagar lakes, besides local wells/tubewells. In normal days, 95 LGPD of water was being supplied to Udaipur city having 3 lakh population, out of which 70 LGPD of water was drawn from Fatehsagar and Pichhola lakes. Due to the meagre rainfall in last two years, water in these two lakes depleted very fast. The State Government executed augmentation water supply scheme on emergency basis to bring 30 LGPD water from Bari Tank besides constructing 45 tubewells and 204 handpumps. By the time the scheme from Bari Tank was commissioned production from above two lakes dropped down considerably. In February 1988, the production from Fatehsagar and Pichhola lakes got reduced to 5 LGPD only and total supply level was reduced to 50 to 55 LGPD. To improve the supply, 20 more tubewells and 150 handpumps were constructed which increased the supply to 58 LGPD in May, 1988.

The water in Bari lake was adequate upto July 1988. To guard against an eventuality of delayed rainfall or inadequate rainfalls, the State Government took up an emergency water supply scheme from Jaisamand lake. This is for bringing 60 LGPD raw water per day from a distance of 57 kilometre. The estimated cost of the scheme is Rs. 16.45 crore. The State Government incurred an expenditure of Rs. 7.40 crore on procuring steel pipes for the scheme.

4.21 Besides, in 111 towns during August 1987 to the end of July 1988, 2,254 handpumps, 330 tubewells etc., were constructed.

4.22 The State has a fleet of 222 water tankers. Out of these, 182 water tankers were used for transporting drinking water to 21,036 villages, having population of 6.14 lakh people. Besides, 69 camel carts and 102 bullock carts and 39 tractor trollies were also used. *Piwai* subsidy was sanctioned for 429 wells, located in 341 villages. 4,093 public wells were also deepened in 3,425 villages.

4.23 In all a sum of Rs.68.72 crore was spent on water supply arrangement during August 1987 to July, 1988. Plan funds were also invested in such a way as to meet the immediate requirements.

4.24 The drought of 1987 under-scored the need of selecting new sources of water on a more sound scientific basis. The use of satellite imageries from remote sensing satellite indicated the area having higher intensity of surface drainage and delineated area having high ground water recharge potential. These imageries also indicated geohydrology of the area culminating into finding higher intensity of linements and the porosity of rocks could also be relatively made known with the superimposition of these indicators of the imageries. It classified very good, good or satisfactory zones for ground water exploitation. Combining results obtained from imageries with the geohydrological information of the area, it was possible to restrict the failure rate in construction of tubewells and handpumps The quick feed back from Satellite imageries helped in achievement of greater success.

4.25 Installation of desalination plants in Rajasthan in most difficult areas was also taken up. The PHED with the assistance of GOI is now installing the desalination plants in 75 villages.

4.26 It was observed that the underground water was being tapped for an immediate solution of the problem of water supply. In case of major towns, solution was proposed from distant sources on which immediate action was required to complete them in earliest possible time. For Ajmer town,

work on Bisalpur scheme was in progress, for Jodhpur town work on Indira Gandhi *Nahar Pariyojana* (IGNP) had already been started, for Bikaner town, work on holding tank was to be done immediately. Similarly for the permanent solution of Udaipur and Jaipur town, work on schemes from Mashi Wakal and Bisalpur dam respectively has to be taken up immediately.

4.27 It was experienced that in case of small towns / villages the concerned Department faced agitated local people for obtaining the local source (wells etc) for the water supply. Farmers also created hurdles in using local wells. It is, therefore, proposed to enact a water management legislation so that use of private wells may not become difficult.

Cattle Care

5.1 The cattle population of Rajasthan was severely affected due to consecutive droughts, culminating in the drought of 1987. The State Government with the assistance of the GOI took special care of the cattle population in the State. Voluntary agencies and *Gram Panchayats* were involved in a big way to procure fodder from neighbouring States and distribute the same in the scarcity-affected districts of the State on 'no-profit, no-loss' basis. The Collectors were directed to motivate these organisations to play a leading role in this behalf.

5.2 3,536fodder depots were opened 1.87 lakh quintal of fodder was distributed by these agencies. Most of the fodder was procured from Punjab.

5.3 The working capital was made available to these agencies in the form of interest-free-loan. Rs.8.40 crore was sanctioned to the Collectors for the purpose. Out of this amount, Rs.7.70 crore was drawn by the Collectors and advanced to these agencies. Besides this amount the Collectors were also advanced money through District Rural Development Agencies of their District. Out of the advances given by the State, Rs.5.84 crore has already been recovered.

5.4 These voluntary agencies were allowed to charge administrative charge at the rate of Rs. 5 per quintal for the fodder transported. This amount of administrative charge was included in the sale price of the fodder. The total amount of transport subsidy paid to these agencies for the period was Rs.92.17 crore from 1st July 1987 to 31st July, 1988.

5.5 As many as 639 cattle camps were opened by voluntary agencies benefiting more than 5 lakh abandoned and handicapped cattle. Mouthwise position of cattle in cattle camps in the State from July, 1987 to July, 1988 may be seen at Fig. 18. Subsidy was paid at the rate of Rs. 4 per cattle per day. The amount sanctioned by the GOI at the rate of Rs. 3 per cattle per day was inadequate. Owing to four subsequent scarcity years faced by the State, the voluntary agencies had drained their financial resources and therefore, they were unable to contribute their share in the form of Rupee one per cattle per day. Hence this precondition was waived by the State Government with effect from 1st July, 1988.

Nutrition.

6.1 Under the Integrated Child Development Services (ICDS) programme, nutrition was provided to children and women once a day. Looking to the severe drought conditions, arrangements were made to provide nutrition twice a day to children and women. The cost of the food provided to the beneficiaries in normal times which is 45 paise was enhanced, since it was not sufficient to meet the food requirement and deficiency, caused by drought. The enhanced rate was 70 paise per day per beneficiary per time.

6.2 The recurring droughts in the State also caused malnutrition in children in the age group of 6-12 years. It was very acute in Barmer, Jaisalmer and Churu districts. As such project authorities were asked to distribute supplementary nutrition in the age group of 6 to 12 years also. It was also distributed to all the children, present and the *anganwadi* centres irrespective of their number.

6.3 To meet the challenge of drought, the number of primary units of the ICDS, that is, *anganwadi* centres were also increased. 364 additional *anganwadi* centres (214 at Barmer and 50 each at Doongarpur, Banswara and Ajmer) were also opened for a specific period to cover more beneficiaries. Necessary instructions were issued to project authorities that supplementary nutrition

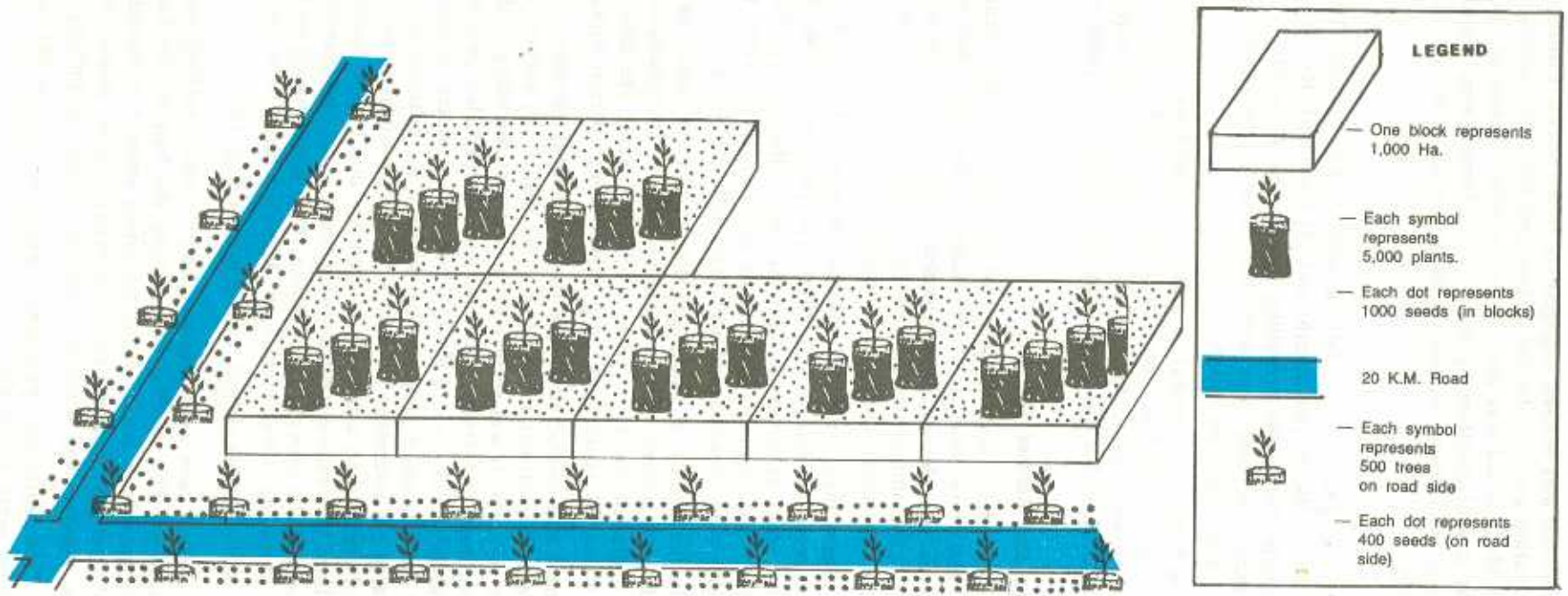


Figure 19: Seeds Sown and Trees Planted in Jhunjhunu District, Rajasthan.

should be provided to children and women engaged on relief works Efforts were made to provide health check-ups, immunization and distribution of iron and folic acid tablets to children and women and Vitamin-A solution. Medical aid was also made available. Teams of doctors and para-medical staff were deputed to pay special attention to the drought affected area. Funds were made available by Relief Department and from Prime Minister's Relief Fund to the extent of Rs.2.77 crore and Rs.59.40 lakh respectively.

Gratuitous Relief

7.1 Gratuitous assistance was given to 2,62,641 persons during 1987-88. The GOI laid down the following scales: (i) For adult, Rs. 60 per month; and (ii) For child, Rs. 30 per month. These rates were found to be inadequate due to the prevailing high prices of essential commodities. Therefore, the State Government enchanced these rates with effect from 1st November, 1987: (i) For adult Rs. 120 per month; and (ii) For child, Rs. 60 per month.

7.2 It was decided by the State Government to make the gratuitous relief available to the selected persons in the form of wheat instead of cash. This was done with a view to minimise chances of misuse of cash assistance. However some districts found it difficult to get required quantities of wheat alloted from the Food Department for this purpose as the number of persons to be benefited was very high in these districts.

Case Studies: Jhunjhunu and Barmer Districts

8.1 Micro studies are very useful in documentation as they provide relief measures undertaken at the grass roots level. They also show innovative approaches to drought relief measures. In Jhunjhunu district of Rajasthan, the district administration adopted an innovative approach by undertaking social forestry. In Barmer district the administration adopted *a holistic* approach to the problem of drought and its mitigation. These two case studies are presented below.

8.2 According to 1981 census there were 689 revenue villages in Jhunjhunu district. Few important *dhanies* were declared as revenue villages by the State Government in 1986. Therefore, total number of villages in Jhunjhunu district at present is 822. All these villages were declared drought affected during 1987-88. From the very beginning of drought year various activities which could reduce the impact of severe drought were planned and executed with full force.

8.3 For the first time in the history of Jhunjhunu district forestry works were taken up on a large scale under drought relief programme. The total forest area in Jhunjhunu district is 39,262 hectare, and most of it has got degraded due to continuous felling of trees. The hills of Arawali range which used to be lushgreen about 50 years back have now become barren topographical features.

8.4 Initially an experiment was conducted by planting some local varieties of the plants in sand dune area and hilly area. Very soon it was revealed that the plants can survive with the help of proper attention and care from villagers. It was surprising to note that the villagers themselves came forward to help the Forest Department in carrying out these works with fullest possible attention. It was only after this that the district level Famine and Relief advisory Committee decided to take up the forestry works on a large scale and a shelf of projects was prepared for different areas of Jhunjhunu district. The people of nearby area got interested in these works as the works to be paid under drought relief programme were directly related to a number of trenches dug by the individual labourer in a day. This pit principle of village distribution gave a strong boost to this programme and after about 2 to 3 months about 40 per cent of the drought relief labour force was working on forestry works. Table 42 reveals that 67 works involving 4,800 hectare of degraded forest was taken up during 1987-88. Details of plantations work in this district are shown in Fig. 19.

8.5 Enclosures of 100 hectare each were prepared and contour trenching method of plantation trees in these areas was taken up. This method of trenching the barren hills has proved to be of great success and it has been possible to conserve the maximum amount of rainfall in the area covered by the trenches. These trenches have not only provided better bed for plants suitable for desert area but at the same time these trenches will serve as a constant source of moisture to the roots of plants.

8.6 Similarly works of "*Panchayat* land plantation" where an area of 240 hectare was covered under drought relief programme were taken up.

Table 42: Plantation work taken up in Jhunjhunu District during drought of 1987-88.

S No.	Scheme	Area	Number of Plants (lakhs)		
			Plantation Work	Seed Sowing Work	Total
1.	Reforestation of Upgraded Forests	4,800 (hectares)	0.15	46 50	46.65
2	Reforestation of Degraded Forest (Enclosures)	1,900 (hectare)		23.61	23.61
3.	*Panchayat* Land Plantation	240 (hectare)	0.96	2.28	3.24
4.	Road Side Plantation	78 Kilometre	0.13	1.03	1 16
5.	Road Side Plantation (Interim Efforts)	150 kilometre			
6.	Preparation of Plants in Nurseries		8.00		
	Total Area Covered	6940 hectare and 228 Kilometre of road length.			
	Total Plants:	74.66 (lakh)			

8.7. An experiment was tried in the district where large number of ring pits on the sides of different roads were dug up. By this method 78 running kilometer length of the roads was covered. Intensive plantation work was taken-up for preparing shelter belts on both sides of the roads.

8.8 To take care of these plantations and for augmenting the irrigation potential of the wells located in various forest area, deepening of irrigation wells was taken up during the drought of 1987-88. Similarly 6 ground level reservoirs were constructed in forest area for creating irrigation facilities.

8.9 Relief funds were utilised in preparing saplings in 8 forest nurseries located in various *panchayat Samiti* area where 8 lakh plants were raised.

8.10 On the whole plantation on 20 per cent of total forest area in the district was taken up and efforts to raise 74 lakh saplings / plants at different locations were made. The results have already started showing up and the barren hills have started bearing a cover of small plants of different species.

8.11 These forestry works were combined with the efforts being made by the Soil Conservation Department and it has been endeavoured that complete catchment areas are developed under drought relief programme. For this purpose, small *anicuts*, guide *bunds*, *nala bunding* works and *pucca talab* works were taken up in forest area. These water retaining and conservation structures will ultimately make the availability of water to the wild life of the forest area on a substantial scale. These forestry works have resulted in following salient features:-

(i) Drought relief funds have been utilised for environmental protection activities which are being stressed upon by the State Government and the GOI;

(ii) These works will result in afforestation / reafforestation on the large barren hills of Aravali range in Jhunjhunu district;

(iii) Wild life consisting of wolves and *neelgais* etc. will get sufficient supply of vegetation and drinking water and thereafter it should be possible to take up the complete area as wild life sanctuary will be a unique exercise in itself; and

(iv) By taking up the forest area under the enclosures it has been possible to remove several encroachments from the forest land. People living near these works have also understood the

advantages of the forests and have started coming forward to save the existing vegetation on their own.

Barmer District: Micro Study of Village Dhorimana

8.12 Barmer district is a desert district situated in western international border of Rajasthan. Drought is a recurring phenomenon here Residents of this area generally struggle with drought with some exception of rain in any one out of 4 to 5 years. Drought of 1987 was severest in this century. The State Government left no stone unturned to provide relief to the affected persons.

8.13 Whole of the district benefited by arrangements made during the drought. Targets were pre-decided to provide relief to villagers and these targets were achieved. Effect of these relief measures was visible. Residents of villages appreciated the efforts made by the Government.

8.14 Village Dhorimana of *Tehsil* Gudha Malani *(Panchayat Samiti* Dholimana) may be taken as an example here. Total area of this village is 6,914 hectare having population of 5,647 out of which 1.506 are scheduled castes and 12 scheduled tribes population. Total cattle population is 2.602. The efforts made by State Government to provide relief and to ensure other arrangements to over come the situation of drought of 1987 may be enumerated.

8.15 *Nadi* works amounting to Rs. 4.60 lakh was sanctioned during 1987-88 for village Dhorimana out of which 4.37 lakh was spent and 65,336 manday was created. Payment of wages at the rate of Rs.6.70 per manday was made. *Nadies* of the village were cleaned and cleared so as to utilise their full capacity. This scheme proved useful for labourers and general public. The effort resulted in increase of filling up capacity of the *nadies* which ultimately improved drinking water situation in the village.

8.16 Village Dhorimana is surrounded by hills. Material for construciton of *pucca* roads was made available from these hills by deploying 10 gangs of Public Works Department(PWD). It helped to provide employment to labourers and to provide material for construction of road by the PWD.

8.17 Due to severe drought and speedy winds, rural houses were damaged which created scarcity of living accommodation for villagers. A sanction of 220 houses at the rate of Rs.2,000 per house was issued for village Dhorimana and 210 houses were constructed. Drainage system based on Gujarat pattern was provided which proved very useful in this *Panchayat Samiti* area. This scheme benefited in two ways to the public. It provided employment as well as houses for inhabitants of the village. The scheme benefited weaker sections of society at large.

8.18 Fair price depots of fodder were opened in this *Gram Panchayat* area. In village Nedi, *Nadi* Depot was managed by private agency and in village Dhorimana depot was managed by *Gram Seva Sahakari Samiti.* 16,270 quintal of fodder was distributed to save and protect lives of animals.

8.19 Farmers of village Dhorimana generally live in *dhanies* and there is no source of drinking water nearby these *dhanies* These farmers have to transport drinking water from a distance. They face drinking water problem in summer because they do not have any storage capacity for drinking water. 231 community tanks were constructed through *gram panchayat* Dhorimana costing Rs. 10,000 per tank. Out of this Rs. 5,000 was labour component borne by cultivator himself. This scheme proved very useful because it provided employment and storage capacity for drinking water. It also solved problem of drinking water in summer.

8.20 Cattle camp was organised at Dhorimana. On conclusion of the drought period, cattle were handed over to their owners after identifying them. This exercise saved 250 animals and ultimately gave a source of livelihood to the animal owners.

8.21 A total of 281 persons who were in ailing condition or destitute were provided relief to save their lives.