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## UNIT 6 DROUGHT: CASE STUDIES

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### 6.0 LEARNING OUTCOME

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After studying this Unit, you should be able to:

- discuss the impacts of drought of 2002 in Gujarat and Rajasthan States;
- describe the institutional response system for drought management in the two States; and
- understand the lessons learnt on the basis of past experiences.

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### 6.1 INTRODUCTION

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India has a long history of droughts. The disastrous droughts of 1877 and 1899 are still remembered. These were the results of scanty monsoon rainfall over most parts of the country and turned into widespread famines. According to the reports of the Famine Commissions, these two disasters took tolls of 38 lakh and 12 lakh lives respectively. The 20<sup>th</sup> century witnessed severe drought in 1918, 1972 and 1987 but the loss of lives was not that much even though the population had increased almost four times. The 21<sup>st</sup> century also faced a widespread drought in the year 2002 but in spite of very great sufferings and economic losses, there were perhaps no deaths attributable to the drought. Having succeeded in avoiding famine conditions in independent India is no mean achievement and can be attributed to the scientific and technical progress and adopting a drought management system. The rising awareness among the people has also been an important factor in resisting and reducing the adverse impacts of severe drought in recent decades. The drought management system and full involvement of all stakeholders, viz., the Government, people and NGO sector has to be ensured and improved further.

### The Severe Drought of the Year 2002

In the previous Unit on Drought (Unit 5), we learnt that if the rainfall deficiency is more than 50 percent of the normal, the drought is called severe and if it affects 20 percent or more area of the country, it is called countrywide or all-India drought. Based on this criteria, the drought of the year 2002 was an all India drought because it affected 52 percent of the districts in the country and the rainfall deficiency was 19 percent below normal for the country as a whole; but it was as large as 65 percent below normal in Rajasthan and 26 percent below normal in Gujarat. Other States had higher deficiency but had irrigation systems. The impact of the drought of 2002 was felt most in Gujarat and Rajasthan, which are otherwise also in the arid part of the country. Therefore these two States have been chosen for case studies in this Unit.

This can best be done through relevant case studies in order to draw lessons for refining and improving approaches to anticipate, mitigate, and manage future droughts. In this context, this Unit will highlight the major issues in disaster management such as impacts of drought, response system, and lessons learnt by studying the case of the recent countrywide drought of 2002 with reference to the two States that suffered the most viz., Gujarat and Rajasthan.

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## 6.2 DROUGHT MANAGEMENT IN GUJARAT: A CASE STUDY

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### 6.2.1 Gujarat: Geography and Demography

Gujarat State is situated in the western part of the country and has a long coastline of about 1600 km. The population of the State as per 2001 census is 5.06 crore, which constitutes about 5 percent of the total population of India. The State has 25 districts and 225 talukas with 18,536 villages. Approximately 65 percent population of Gujarat lives in rural areas.

Gujarat State has three distinct regions, viz., Gujarat, Kutch and Saurashtra. Therefore one has to distinguish between the Gujarat Region (the eastern part of this State) and the Gujarat State.

Agriculture in Gujarat is mainly rainfed, and in this regard normal rainfall is absolutely crucial to agriculture. Out of the cultivable area only 30 percent is irrigated by canals, tube-wells and open-wells and that makes a major part of the State's economy dependent on rains. The State Government has initiated a number of long-term measures to combat water scarcity. There are considerable number of small and medium reservoirs and check-dams but these reservoirs generally do not get filled due to shortage of rainfall. This phenomenon has led to acute drinking water shortage.

### 6.2.2 Drought, 2002

Drought condition is declared not only on the basis of rainfall but there is a set procedure under the Gujarat Land Revenue rules and Gujarat Relief Manual, Revenue officials make a survey and estimate the likely shortfall in crop yield due to drought conditions. This is done for every village and every crop.

As a result of such valuation survey, 6111 villages were declared drought-hit in Gujarat in 2002 affecting almost 12 lakh farmer families.

Some rainfall was observed in the districts of South Gujarat, Amreli, Bhavnagar, Panchmahal, Dahod, Gandhinagar and Mehsana districts of Gujarat. However, other parts did not receive rainfall and were facing drinking water problems and drought conditions.

### 6.2.3 Impacts of Drought

In 2002, 13 districts of Gujarat State received less than normal rainfall. It resulted in reduction in the agriculture production and also slowed down the small and medium industries. This affected crop production, employment opportunities, hydropower projects etc. In this section, we will discuss the impact of drought in Gujarat, itemwise, in some detail. It will be of interest to mention here that a specially disturbing feature of the monsoon rainfall in 2002 was that the monsoon, having started well in June, failed almost all over the country in July. There was some improvement in August and September but the large deficit could not be made up. Absence of adequate rain in July withered the crops sown in June, and after August it was too late to sow again.

#### i) Water level

The inadequate rainfall had a severe impact on drinking water situation and 83 talukas were facing drinking water problem. Even the level in the water reservoirs of Saurashtra, Kutch, and North Gujarat was almost zero. Table 6.1 shows the situation of water level in the reservoirs as on 31-12-2002, i.e. at the end of the rain giving monsoon and cyclone season and at the threshold of the harsh summer season.

**Table 6.1: Regionwise Water Level in the Reservoirs**

Region	Capacity of storage (Mm <sup>3</sup> )*	Actual Storage (Mm <sup>3</sup> )	Filled (%)
Gujarat	12321.47	5603.78	45.48
Kutch	266.68	<b>6.72</b>	2.52
Saurashtra	2325.02	425.46	18.30
Total For the State	14913.17	6035.96	40.47

Source: Ministry of Agriculture, Government of India.

\*Mm<sup>3</sup>: Million Cubic Meter

It is evident from the data that in the Kutch region, the situation of water level in the reservoirs was worst, i.e. only 2.52 percent of the designed live storage capacity. Almost **all** villages in the region were facing acute drinking water crisis. The situation of coastal areas in the district of Junagarh comprising of Veraval, Mangarol, Malya and Una was more critical due to non-availability of surface water as well as ground water. In this condition, children and women were worst sufferers.

#### ii) Women and Children

The women and children were affected adversely from the point of view of their nutritional level and basic food requirements. The expecting, and lactating mothers were the worst sufferers and so were the aged and children. It was reported that **6436** pregnant women and children were directly affected by the drought in Gujarat.

#### iii) Livestock

There **was** acute shortage of fodder due to the erratic rainfall. Out of 72 lakh cattle, over 50 lakh cattle were affected. However, there was no loss of cattle wealth as the State Government arranged fodder, drinking water, and animal healthcare services in the drought-hit areas.

#### iv) Employment

The labour force, which was dependent on agriculture, that is **farmers** and traditional artisans suffered due to reduced employment opportunities in regular work. As a result, people either

became jobless or transferred to marginal works. Hence, 16 lakh workers were without employment for a period of eight months. It affected the economy of the State and development.

#### vi) Development

The economy of Gujarat is mainly dependent on agriculture and industrial activities. Two-third of the population earns livelihood directly from agriculture. Due to the drought condition, 11,79,661 farmers families were affected. Total production loss, during 2002 for Kharif and Rabi crop was estimated at more than Rs. 3153.14 crore. The analysis of area sown under different crops shows that all major crops were adversely affected, and there was a decrease of 6.66 lakh hectares as compared to the area sown in the previous year. As rural and urban development system is interdependent, the adverse impact on rural sector had a direct effect on urban development. The scanty rainfall affected power generation that affected the industrial activity very adversely. As even routine activities slowed down or were hampered, the development work was severely affected and came to a standstill.

#### v) Hydropower Generation

There was a shortfall of about 1700MW in catering to the power demand due to scanty and erratic rainfall. The resultant energy scarcity further worsened the situation on agricultural and industrial fronts, not to speak of the basic needs of the people for drinking water and comfort.

### 6.2.4 Drought Management

The Government of Gujarat (vide Notification No. DMA-1003-1488 B dated 29th August, 2003 in the official Gazette) established Gujarat State Disaster Management Authority (GSDMA) w.e.f. 1.9.2003. According to the Gujarat State Disaster Management Act, Gujarat Act No. 20 OF 2003, the GSDMA will facilitate, co-ordinate and monitor the disaster management activities of the Revenue Department and other relevant Government Departments, where necessary. The Revenue Department, through the offices of the District Collector along with relevant Government departments will be responsible for implementing emergency relief measures and relief after a disaster.

#### i) Drought: Forecasting and Warning System

For accurate drought forecasting, and warning, the Gujarat Government has constituted Weather Watch Group under the Chairmanship of Principal Secretary (Revenue/Agriculture). This group consists of the Principal Secretary, Secretary, Agriculture and Co-operation Department, Secretary, Narmada and Water Resources, Relief Commissioner and Secretary (Scarcity), Joint CEO, GSDMA Gandhinagar, Director, IMD, Ahmedabad, Director, ISRO, Director, RESECO, Gandhinagar, Deputy Chairman, Gujarat Maritime Board, Deputy Secretary (Scarcity), Revenue Department, Director, Agriculture, and Relief Commissioner and Deputy Secretary. This group meets every week to monitor and analyse the monsoon activity. The Government has set-up rain gauge stations at taluka and sub-centre levels. The rainfall data of the past 24 hours is collected from all the districts through online services. The Weather Watch Group monitors the situation of rainfall and analyses the water levels of reservoirs and position of ground water resources. In addition as the agricultural activities depend on rainfall, the status of sowing operations and crop situation is also monitored.

#### ii) Drought: Relief Measures

The State Government had laid focus on employment generation for providing relief. For this purpose, districtwise Master-Plans were prepared. SGRY pattern was applied for providing employment to unemployed people from the drought affected areas. During the drought, 11.94

lakh labourers were given wage employment and total number of 6.67 crore mandays of employment were generated. For providing wage employment in drought hit areas, the Gujarat Government incurred an expenditure of Rs. 211 crore under various programmes and schemes.

#### **Food for Work**

Under the SGRY special component, foodgrain was distributed to the workers as a part of wages to establish food security. Under this programme, 2.10 lakh MT foodgrain had been distributed.

#### **Cash doles**

The old, infirm, children and expectant women were provided with cash doles during drought as a part of relief policy as they were unable to work under the harsh and hot weather. As per policy, the adult beneficiaries were provided cash doles of Rs. 10/- per day, children Rs. 5/- per day and expectant women Rs. 20/- per day.

#### **Drinking Water**

During the drought period (2002-2003), there was an acute drinking water problem. In Gujarat, 6263 villages and 54 towns were facing acute problem of drinking water. The Water Supply Department of the State launched round the clock programme of drilling bores, tube-wells, deepening of wells, hand pump repairing, etc. 150 mm/ 100 mm bore/deep tube-wells were drilled in 1761 villages. Besides, the Gujarat Government provided water to the affected areas through road and railway tankers. Thus for providing drinking water in the affected area, the State Government incurred an expenditure of Rs. 127 crore.

Government of Gujarat also look up long-term drought mitigation measures like water conservation schemes as a priority measure to mitigate the effects of the drought. In this context, more than 20,000 check dams were constructed and more than 1500 ponds were dug up/deepened.

Under the Centrally Sponsored Watershed Development Programme, the following schemes as depicted in table 6.2 were taken up by the State during 2002-03.

**Table 6.2 Programmes/Schemes for Drought Management**

Programme/Scheme	Project Completed	Area Covered (hectares)	Ongoing Project	Area under Action (hectares)
1. DPAP	689	3,44,500	1461	7,30,500
2. DDP	577	2,88,500	1494	7,47,000
3. IWDP	-	-	521	2,60,500
4. EAS	546	2,73,000	-	-

Source: Department of Agriculture & Co-operation, Ministry of Agriculture, Government of India.

1. DPAP - Drought Prone Area Programme
2. DDP - Desert Development Programme
3. IWDP - Integrated Wasteland Development Programme
4. EAS - Employment Assurance Scheme

As per the Gujarat State Relief Manual, priority was given to useful and productive works like percolation tanks. During the drought year 2002-03, 258 works of check dams were completed. In addition, as a part of water harvesting scheme, 2773 works under Sardar Patel Sahabagi Jal Sanchay Yojana were completed.

### Fodder

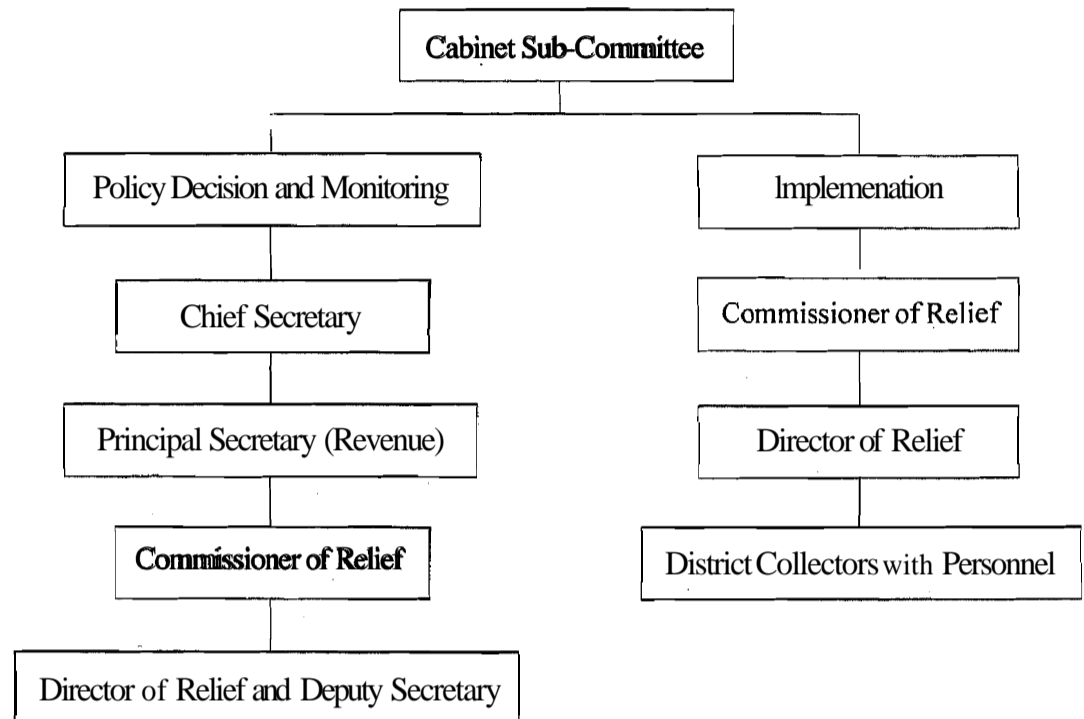
In the State, 56.30 lakh cattle were affected on account of the drought situation. In the affected districts, fodder was distributed through grass depots. For this purpose, 373 grass depots were opened. The arrangements were made to provide 1120.66 lakh kg grass and 110.80 lakh Kg cattlefeed in the affected areas.

### Maintenance of Gaushalas and Cattle Camp

Gaushala and Pinjarapoles were operated to maintain 1,63,083 cattles during the period of drought. Gujarat Government provided subsidy for cattle maintenance at the rate of Rs. 10/- per day. Government had incurred an expenditure of Rs. 43.5 crore towards cattle subsidy.

### iii) Drought Management: Organisational Structure

Chart 6.1: Organisational Structure for Drought Management in Gujarat



Source: Department of Agriculture & Cooperation, Ministry of Agriculture

The organisational structure as shown in Chart 6.1 came into existence and started functioning on the declaration of drought 2002-03.

As soon as a drought is declared in the State, the Cabinet Sub-committee comes into existence under the chairmanship of the Chief Minister for overall monitoring of drought related measures. It is consisting of Minister Finance, Minister Revenue, Minister Agriculture, Minister Water Supply, Minister Energy, and Secretaries of various key Departments as members of the Committee. The Department of Revenue monitors all the drought related activities and areas of concern such as health care, water supply, and animal care in the drought-hit areas in association with the Departments of Health and Family Welfare, Water supply, and Animal Husbandry respectively.

The administrative structure at the State level has an important role in smooth functioning of drought management programme. In this context, the Commissioner of Relief serves as the link between District Administration and the State Government. The Principal Secretary, Revenue takes decision on the basis of feedback received from the district. The Director of Relief is the key officer to assist the Commissioner of Relief by maintaining constant liaison between district and state level mechanism and monitors regularly the requirements of man-power, tools, finance etc. to facilitate the entire

administrative machinery engaged in drought relief. The Chief Minister does overall review, and the entire management of drought management in the State remains under review and scrutiny of the Chief Minister.

The monitoring and implementation system of the State Government (as shown in Chart 6.1) proved very effective to handle the drought crisis. Policy decisions for relief measures were structured on the basis of past experiences of droughts. In addition, the authorities of the affected districts were directed to strictly operate the laid down policies and procedures for drought management. For an effective monitoring and execution of relief works, administrative support structure was provided at the State, District and Taluka levels. A separate establishment for fodder supply and fodder management was also created as an important part of disaster management.

At the State level, the Scarcity Cell was assigned jobs such as day-to-day monitoring of the progress of relief works, fodder management, cash-dole, food grain distribution, payment made to the workers, and financial and other facilities required by the district administration.

A Quality Control Cell under the supervision of an Executive Engineer with other technical staff was set-up to monitor relief work from the quality as well as measurement point of view.

Surprise inspections were carried out by the State level as well as district level inspection teams to check and control irregularities in the relief efforts.

#### iv) Development Changes between Droughts of 1987 and 2002

The drought years of 1985-86 and 1987 were crucial due to their consecutive effect on almost all the villages of the State. In drought of 1987, the monsoon rainfall deficiency in the Saurashtra and Kutch region of the State was as much as 76 percent below normal creating acute drought conditions and the State Government had to incur considerable expenditure but learnt many lessons as well which proved useful in dealing with drought of 2002. But in the meantime, Gujarat had also to deal with the severe earthquake in Bhuj in the Saurashtra and Kutch region in January 2001 and before the State could recover from this disaster, it had to face the drought of 2002.

As far as wages are concerned, the rate of relief wage was Rs. 11 per day in 1987. Whereas Rs. 42 per day was given to the worker as relief wage in the circumstances of rising index in 2002. The records highlight that majority of the road works were carried out during 1985-87. However, productivity concept in relief works was applied for the first time in the State. As a result, sustainable community assets were created. Even in the field of agriculture pattern, there has been a lot of change wherein a system of shifting of crop pattern has been developed. In addition, area covered under High Yield Variety was increased by 81.60 percent (2002) as compared to 1987. Last but not the least, the size of irrigated area increased by 39.11 percent (2002) as compared to 1987. Further, the farmers were encouraged to go for cash crops to obtain ready market for their products. Thus, the Government of Gujarat performed better in handling the drought situation of 2002 effectively.

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## 6.3 DROUGHT MANAGEMENT IN RAJASTHAN. A CASE STUDY

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### 6.3.1 Rajasthan — Geography and Demography

Rajasthan is the largest State with a land area of 3,42,239 sq km. and spread over 32 districts having 41,538 villages and 5.65 crore population. As per the 2001 Census, 4.33 crore population belongs to rural areas and 1.32 crore population live in urban area. Thus the overall population of

Rajasthan is almost the same as that of Gujarat but the population density is much less in Rajasthan because it has a large area. In terms of annual rainfall, both the States are rain deficient, receiving less than 20cm rain per year. The State of Rajasthan has only one percent of the water resources of India although it has 10.41 percent area of the entire country. In the Rajasthan State, 12 districts comprise 60 percent of the area that fall within the Great Indian Desert (Thar). This is the most populated desert in the World, where 64 percent of the State's population resides, despite scanty rainfall with all its variation in time and intensity. The climate varies from arid to sub-humid. Low rainfall coupled with erratic behaviour of the monsoon makes Rajasthan most vulnerable to drought. The frequency of occurrence of droughts in the State is about once in three years in the Western districts, viz., Bannar, Jaisalmer, Jalore, Jodhpur and Sirohi districts. However, frequency rate is minimum in the eastern districts like Bharatpur and Dholpur about once in eight years.

### 6.3.2 Drought, 2002

In the history of Rajasthan, the drought of 2002 was among the worst droughts, caused by the failure of the southwest monsoon in all the 32 districts. All districts received scanty/deficient rainfall. Overall monsoon rainfall deficiency in Rajasthan in 2002 was (-) 65 percent, i.e. 65 percent below normal, which was the lowest in the last 100 years. In western parts of Rajasthan, the situation was worse with monsoon rain deficiency being 71 percent below normal.

### 6.3.3 Impacts of Drought

In 40990 villages, 4.48 crore people and 4.52 crore livestock were in the grip of drought of rare severity. Almost entire crop was damaged due to long dry spell throughout July 2002. As against the normal sown area of 129 lakh hectares in kharif, only 82.26 lakh hectares could be sown. Most of the surface water sources were dry, ground water table was depleted by 3.2 meters to 6 meters and reservoirs received only 32 percent water as against their designed capacity. Drought 2002 was the fifth year of drought in succession in Rajasthan and a drought of rare severity. Table 6.3 shows the impact of droughts from 1998 to 2002.

Table 6.3: Impacts of Drought

Year	No. of Affected Districts	No. of Affected Villages	Affected Population (In lac)	Affected Cattle (in lac)	Damaged Crop (Value in Rs. crore)
1998-1999	20	20069	215.07	295.78	2283.49
1999-2000	26	23406	261.79	345.60	3407.02
2000-2001	31	30583	330.41	399.69	3511.77
2001-2002	18	7964	69.70	69.73	1252.27
2002-2003	32	40990	447.80	451.63	4414.00

Source: Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India.

This unprecedented situation was a major challenge for the Government because of the vulnerable situation of the people. The combination of inflation, unemployment and reduced agricultural and industrial output led to depression of demand in the economy of the State. At the household level, the major impact of drought was on income and consequently, poor people were the worst sufferers due to severe food shortage.



### 6.3.4 Drought Management

#### i) Early Warning System

The Weather Watch Group (WWG) under the Chairmanship of the Relief Secretary monitors the agro climatic parameters and provides early warning of drought onset conditions. This Group consists of the Relief Secretary, Director Agriculture, Director, IMD, Hydrologist, Irrigation Department and the representatives of PHED and the Ground Water Department.

#### ii) Action Plan

The Drought Action Plan was prepared by the District Collectors on the basis of District Contingency Plan. The major items of the Action Plan were employment generation, cattle conservation, drinking water supply and medicines. The total estimated funds required for this plan were Rs. 6115 crore, which were revised to Rs. 7519 crore during the Central Study Team's visit.

#### iii) Relief Measures

##### *Drinking Water*

As all major sources of drinking water had dried up, a contingency plan of Rs. 518 crore was prepared and implemented to ensure supply of drinking water. For provision of drinking water, hand pump repair campaign was launched, 24895 traditional sources of water were revived, and 2250 new tubewells and 22258 new hand pumps were installed. In addition, water was transported to 10530 villages and 74 towns through tankers and railway wagons.

##### *Wealth and Nutrition*

As against the normal scheme of 100 beneficiaries per 'Aanganbari', 100 percent coverage of the age group of 0-6 years and expectant women was made in severely affected blocks. The Mid-Day Meal scheme was continued even during summer vacations for 7 lakh school students. The District Collectors were given a revolving fund of Rs. 2 lakh per district for emergency purchase of medicines. Mobile medical teams provided health services in remote areas. Teams of Medical and Health Department carried out regular health examination of the labourers employed on relief works in the drought affected areas. Medicare cards were issued to 23 lakh BPL families for free treatment including medicines in Government Hospitals.

##### *Employment Generation*

The major thrust area in providing relief to about 38 million vulnerable people was the employment generations specially for people below poverty line, small and marginal farmers and landless agriculture labourers etc.

As the immediate impact of drought was on the rural income i.e. on the means of livelihood, about 80 percent of the outlay proposed for relief was allocated to provide employment opportunities. During 2002, 331169 works were sanctioned on which 43.44 crore mandays of employment were generated for relief work. The average wage paid to the workers was Rs. 55.11 per day and 75 percent wages were paid in wheat allotted under Sampoorna Grameen Rozgar Yojna, (SGRY).

##### *Gratuitous Relief*

In the unprecedented situation, some vulnerable unemployed families i.e. about 5 lakh people were provided foodgrains at the rate of 10 kg per person. In addition, 5.15 lakh people who were destitute and sick were identified, and provided 50 kg foodgrains and Rs. 30 per month during drought period.

### Essential Commodities

To strengthen the public distribution system, special attention was given to the effective implementation of the safety net schemes like Targeted Public Distribution System and the Antyodaya Anna Yojana.

### Cattle Conservation

To provide sufficient fodder, fodder production was encouraged in 9 affected districts by extending subsidy to the farmers to grow fodder. The State Government provided cattle food subsidy, and cattle camps were set-up through voluntary agencies. A bull subsidy was provided to maintain pedigree bulls, which were maintained by Panchayats.

### Transparency in Management of Relief Operations

The management of drought 2002 was reported to be corruption free due to the transparency and vigilance measures undertaken by the State Government. In this context, Rajasthan Right to information Act, 2000, provided uninhabited access to the people to records and information on drought relief activities. The relief works were subject to social audit in Gram Sabha. NGOs also played pro-active role in keeping vigilance and providing feedback.

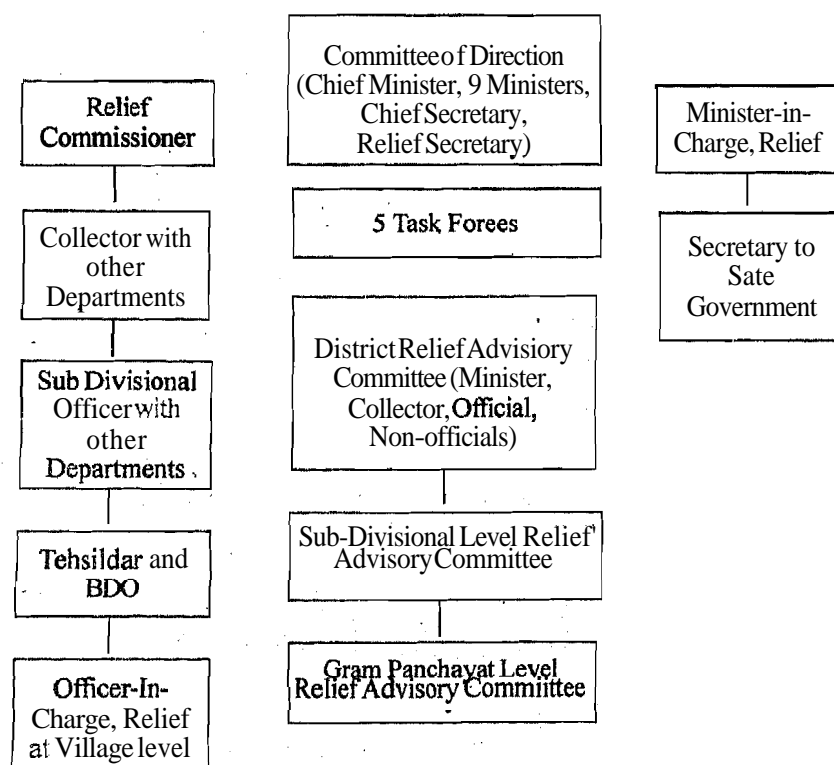
### Special Measures

The State Government decided a special package of relief measures for 74 drought-affected blocks. These measures included higher allocation of labour ceiling for wage employment; additional funds for drinking water, special health care measures, additional funds for cattle conservation activities, provision for supplementary nutrition and filling up of vacant posts on priority basis.

### iv) Drought Management: Organisational Structure

The organisational structure for the management of the drought in the State is depicted in Chart 6.2.

Chart 6.2 Organisational Structure for Drought Management in Rajasthan



Source: Ministry of Agriculture, Government of India.

It is evident from the above chart that the Committee of Direction was at the apex level. This committee was the highest decision-making body for drought management. During the drought period, the committee members met twice in every month under the leadership of Chief Minister to discuss the progress of disaster management. Five task forces were set-up to closely monitor the various drought relief activities on relief work, drinking water, fodder, nutrition and health, and energy. They met regularly on fortnightly basis. At the district level, District and Sub-Divisional Relief Committees headed by the Minister-in-Charge of the district and co-chaired by the Collector looked after relief measures and closely monitored the implementation. The Chart 6.2 highlights the sub-divisional level relief advisory committee also. In this hierarchy, there is a committee comprising both public leaders and administrators at the block level. This committee is headed by the Sub-Divisional Officer, followed by a Committee at the village panchayat level headed by the Sarpanch.

### Control Rooms

Control rooms were set-up at the State, District and Block levels, which were managed by senior officials. They continuously functioned during the drought period to detect early signals of emerging disaster and initiate timely action to avert crises.

Thus, the officials working in the control rooms were responsible to get information and further inform the concerned officer about the periodical information on various relief activities from the field.

### v) Role of Voluntary Organisations

The voluntary organisations including NGOs contributed and rendered very useful services in the implementation of drought relief programmes. They participated in procurement and distribution of fodder, maintenance of cattle camps, running community kitchens, and providing drinking water in drought prone areas.

### vi) Development Changes: Between Drought of 1987 and 2002

As already stated, 2002 was the fifth year of drought in succession and a drought of rare severity in Rajasthan. Table 6.3 shows the data from 1998-99 to 2002-03 regarding impacts of droughts. It is evident from the data that number of affected districts increased from 20 to 32 and the value of damage to crop also increased from Rs. 2283.49 crore to Rs. 4414.00 crore. A study of development changes between the two major droughts of 1987 and 2002 indicates that the State made steady progress in drought management and poverty reduction. The impact of these efforts is evident from the fact that even during period of drought in 2002-03, large-scale migration of human and cattle population did not take place. In addition, the capacity of the system to respond to the needs of the affected citizens got increased and certain amount of resilience had been developed to face the challenge.

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## 6.4 LESSONS LEARNT

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The study of disaster management in the States of Gujarat and Rajasthan with reference to the drought of 2002 reveals that the people and the Government made considerable attempts to meet the challenges posed by disasters. The citizens actively participated in water harvesting through traditional methods, deepening village ponds, recharging dried wells and construction of simple watersheds. In addition, the actions initiated by the Government such as effective monitoring for Weather Watch Group and their immediate response to the impending scarcity situation helped in providing relief.

For maintaining proper supply of drinking water to affected areas, the district authorities provided the water tankers through road and rail wherever shortage existed. In addition, preparation of timely Action Plans for tackling scarcity helped in managing drought conditions successfully.

A policy directive issued by the State Government to preserve water, which is available in the reservoirs for drinking only and not to release for irrigation unless approved by a High Level Committee saved a good quantity of water. In addition, stopping supply of water from dams and reservoirs to the industries also contributed to reserve water for day-to-day use. The provision of electric connections to the farmers through the Electricity Board also helped to energise their water source.

The drought created unemployment problems more so in rural areas. In this context, various programmes and schemes of the Central Government and State Government were very helpful, namely Swarnajayanti Gram Swarajgar Yojana, Employment Assurance Scheme, National Social Assistance Programme, Indira Awaas Yojana, and Innovative Schemes for Rural Housing and Habitat Development, and Pradhanmantri Gramodaya Yojana. These schemes/programmes aimed at improving the socio-economic conditions of poor people.

To provide employment opportunities, NGOs initiated efforts to search for alternative livelihood vocations that include leather work, weaving, craft, dairying, sheep and goat rearing, soap manufacturing, "pattal" and "dona" making, masonry, tailoring, preservation of fruits and vegetables, sale of local crafts, grinding spices and many others.

Apart from the participation of citizens, Community Based Organisations and NGOs, the role of Government at the State level and Central level for providing relief in cash and kind was very important.

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## 6.5 CONCLUSION

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In this Unit, we have mainly discussed the role of State Governments in drought management on the basis of case studies of the drought of 2002 in Gujarat and Rajasthan. Though not much can be done to prevent natural disasters such as severe droughts, but intensity of their impact can be reduced considerably through adequate planning, early warning, and implementation of action plans with the joint efforts of the Government and citizens. This Unit has also discussed the organisational structure of the States of Gujarat and Rajasthan for drought management and how it proved effective in 2002. In addition, institutional response system, relief measures taken by the State Government, role of community based organisations have been described. It has also been brought out that the State Administration learnt from the experience of droughts of the immediate past. This fact highlights the importance of Case Studies in disaster management.

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## 6.6 KEY CONCEPTS

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<b>CEO</b>	:	Chief Executive Officer
<b>Community preparedness</b>	:	It involves actions taken beforehand by community to mitigate the effects of potential disasters,
<b>Evacuation plan</b>	:	It is a structured procedure, whereby persons can be moved from a threatened or affected area to a safer place
<b>GSDMA</b>	:	Gujarat State Disaster Management Authority
<b>IMD</b>	:	India Meteorological Department
<b>ISRO</b>	:	Indian Space Research Organisation

- Needs Assessment** : It is an estimate of what assistance is needed by a district of the State, following a disaster.
- PHED** : Public Health Engineering Department
- SGRY** : Sampoorna Grameen Rozagar Yojana.

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## 6.7 REFERENCES AND FURTHER READING

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Gupta, L.C. and Vinod K. Sharma, 2001, Drought in *Gujarat*, 1999-2000 & 2000-2001, Indian Institute of Public Administration, New Delhi.

Sahni, Pardeep and Madhavi Malagoda Ariyabandhu, 2003, *Disaster Risk Reduction in South Asia*, Prentice-Hall of India, New Delhi,

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## 6.8 ACTIVITY

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- 1) Prepare a list of development programmes directly linked with drought management in your area, and discuss briefly.
- 2) On the basis of study and observations, describe the role of State Government in drought management.
- 3) Explain the arrangements for drinking water supply and livelihood options in any drought prone area.
- 4) Describe the organisational structure for drought management established in either Gujarat or Rajasthan.