

Effect of Drought on Nutritional Status of Rural Community in Karnataka

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ABSTRACT The State of Karnataka experienced drought during the year 2002, resulting fall in agricultural production, food insecurity, acute shortage of drinking water and fodder for cattle, reduced employment opportunities (in the labour activities) leading to migration of individuals to neighboring States. It was reported that the coverage of households in food for work programme, undertaken under drought relief works was poor (10.3%) and a family on an average, had an opportunity to participate in these works for a maximum of only 3 days during the entire drought period. However, a majority (71%) of the households were benefited with the developmental programme TPDS, while coverage of households in old age pension scheme (7.3%) and AAY (2.2%) was very poor in the villages covered for the present study. The intakes of foodstuffs at the household level, such as green leafy vegetables, roots and tubers, other vegetables, fruits, milk and milk products, fats and sugar was lower as compared to RDA as well as the levels reported by NNMB in its survey during non-drought period (2000-2001). The daily average intake of all the nutrients except calcium and thiamin was less than the levels recommended. The adverse effect of drought was reflected by marked decrease in the intake of vitamin A and concomitant increase in the prevalence of Bitot's Spots among preschool children. Food insecurity, particularly with respect to income elastic foods was significantly higher among SC/ST communities and in the households engaged in labour activities. Similarly, higher proportion of HHs of SC/ST communities and those households engaged in agricultural labour, adopted coping strategies like consumption of low cost foods and reduction in the quantities of food consumed. The prevalence of undernutrition among preschool children during current drought and non-drought periods was comparable perhaps due to effective implementation of supplementary nutrition programmes like ICDS in these areas. However, the prevalence of CED among adults was significantly higher during the current drought, which is reflection of reduction in the overall intake of dietary energy. The study revealed that though the serious ill effects of drought were largely prevented, there is a need to strengthen the drought relief programmes as well as supplementary nutrition programmes.

INTRODUCTION

The year 2002 was another year of drought in several parts of India, including the State of Karnataka. Recurrent droughts are known to affect the country's economy adversely, in terms of drop in agricultural production and agro based industrial output, increase in rural unemployment, decrease in purchasing power, reduce household food and nutrition security, migration of rural poor to urban areas and large scale displacement or death of cattle. In turn, these will lead to sharp increase in the prevalence of undernutrition, morbidity and mortality in the community. The consequences of such droughts are more severe among the poor, who are most vulnerable in terms of their access to resources (Dreze and Sen, 1989). A rapid survey was undertaken at the request of Ministry of Agriculture, Government Of India, during the

months of May and June 2003, to assess the diet and nutrition situation in drought affected States viz., Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Madhya Pradesh, Chattisgarh, Gujarat, Rajasthan and Orissa. The results of the survey in the State of Karnataka are presented here.

Objectives

The objectives of the present study are

To assess food and nutrient intakes of population in the drought affected areas,

To assess household food security status and coping mechanisms adopted by the community during the current drought,

To assess nutritional status of the community in terms of anthropometry and clinical examination and

To assess the extent of participation of households in drought relief activities and other development programmes, to assess the impact of drought, if any, on vulnerable segments of the

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population, such as Scheduled caste and Scheduled tribe communities, marginal farmers and landless labourers.

SAMPLING METHODOLOGY

Based on the rainfall during the year 2002, the Government of Karnataka declared 151 out of 176 taluks, spread over 24 districts in the State as drought affected. In consultation with local officials, two severely drought-affected districts, viz., Gulbarga and Kolar, representing two different geographical regions of the State were selected for the study. From each of these districts, two of the most severely affected blocks viz., Shorapur and Shahapur from Gulbarga and Bagepalli and Sidlaghatta from Kolar districts were selected. Assuming that all the villages within the block were equally affected by drought, five villages from each block were randomly selected. From each village, 60 households (HHs) were covered for survey by using cluster-sampling procedure. For this purpose, the village was divided into 5 geographical areas based on natural groups of HHs or streets or Mohallas. The Scheduled Caste/Scheduled Tribe population, who generally live together, formed one of the areas. From each of the areas, 12 contiguous households were surveyed for the study by selecting a random start.

Investigations: Demographic and socio-economic particulars were collected from all the HHs selected for the survey. All the available pre-school children and adult (≥ 18 years) men and women from these HHs were examined for anthropometry and clinical signs of nutritional deficiency. While both heights and weights were recorded for adults, only weights were recorded for pre-school children.

The children were grouped into different grades of nutritional status by Standard Deviation classification (WHO, 1983) using National Centre for Health Statistics (NCHS) standards (Hamill et al, 1979). The nutritional status of adults was determined according to Body Mass Index (James et al, 1988).

Information pertaining to household food security during previous three months as perceived by head of the household in comparison with normal period and coping strategies adopted during food scarcity was collected in every third household covered for

nutritional assessment. Average daily intake of various foods at house-hold level was assessed by carrying out 24-hour diet recall in every alternate house (10HHs) covered for household food security. The food intakes were compared with the levels suggested as balanced diets in Recommended Dietary Intakes for Indians (ICMR, 1981). Average daily intakes of various nutrients were computed by using food composition tables (Gopalan et al, 1990) and intakes were compared with Recommended Dietary Intakes for Indians (ICMR, 1990). Information was also collected from all the households on participation in drought relief / developmental programmes that were being implemented in the village.

RESULTS

General Conditions in the Study Area: In the State of Karnataka, the agricultural operations are predominantly rain-fed. The Southwest monsoon, which normally caters to about 70% of the Khariff area, is crucial for the success of agriculture in the State. During the year 2002, though the Southwest monsoon entered the State during the first week of June 2002, its activity was weak over the State. The average rainfall reported was to be less than normal not only during the drought year of 2002, but also in the previous three to four consecutive years. In spite of the poor monsoon, agricultural operations were undertaken and khariff crops like ragi, jowar, bajra, short duration pulses, groundnuts, sunflower etc; were sown in most of the dry land in both the districts selected. However, there was 75% to 90% reduction in yield of various crops compared to normal periods in both the districts. Due to reduced employment opportunities in the labour activities during drought, migration of individuals to neighboring States, such as Maharashtra and Goa was reported in about 50-70% of villages in Gulbarga district and 30% of villages in Kolar district.

The prevailing drought conditions in these areas resulted in dried up water sources, causing an acute shortage of drinking water. The problem was mitigated to a certain extent by construction of community water tanks under mini-water supply scheme in some of the villages of both the districts and by revival and rejuvenation of

the already existing mini water supply sources. The scarcity of fodder was reported in both the districts, but the extent of deficit was relatively more in Kolar as compared to Gulbarga district. Even the cattle camps established by the Government in Kolar district were closed within 3 days of starting. Drought relief works, such as pitching (laying of stones for road construction), deepening of irrigation tanks and construction of drinking water tubs for cattle were carried out in all the villages surveyed in Kolar district, while similar activities were undertaken in only 64% of the villages of Gulbarga district. Though all the adults in 1202 households covered in the present study were eligible to participate in these relief works, only about 10% HHs participated in the programme. In some villages, the wages for those who participated in these relief works were paid part in cash (Rs.15/- per person/day) and part in kind (5 kg of rice per person/day). In the rest, the wages were paid in cash @ Rs. 30-50/- per person/day. It was reported that on an average, a family had an opportunity to participate in these works for a maximum of 3 days during the entire drought period.

Coverage: A total of 1202 households (HHs) were covered for demographic and socio-economic particulars, while household food security was assessed in a sub-sample of 402 households. Dietary assessment was carried out in a sub-sample of 200 HHs. A total of 2,967 individuals (678 pre-school children and 2,289 adult men and women) from 1202 households were covered for anthropometry and clinical examination.

Socio-economic Profile of the Households: About 29% of the households belonged to backward communities, 28% to Scheduled caste, 12% to Scheduled tribes and 32% to other communities. The average family size was 6.2 per HH. Nearly a fourth of the HHs were large families having ≥ 8 members, while about 28% of the HHs had < 5 members.

About 82% of the households surveyed possessed land of varying extent. Nearly one third of the HHs were marginal farmers (< 2.5 acres, 35.8%), followed by large farmers (≥ 5.0 acres, 24%) and small farmers (2.5-5.0 acres, 22.3%). In a majority of the households (62%) major occupation of head of household was either agricultural labour (32.9%) or cultivation (28.9%), while 22% were engaged in non-agricultural labour. Thirty four percent of the

households had ≥ 3 earning members, 41% had two and 24% had single earning member. In general, about 80% of the households reported reduction in duration of employment. There was 15% increase in the number of individuals participating in labour activities during drought. Of those HHs, which possessed different types of livestock, 14% of HHs reported cattle deaths and 28% reported deaths of sheep/goats, while 33% reported deaths of poultry due to severe drought conditions. Only 10% of HHs reported that they participated in Sampoorana Grameena Rozgar Yojana (SGRY) scheme. Many (71%) of the HHs availed rations from Targeted Public Distribution Scheme (TPDS). The participation in other programmes such as, old age pension scheme (7.3%), Public Distribution System (PDS) (4.0%) and Antyodaya Anna Yojana (AAY) (2.2%) was relatively low. The Integrated Child Development Services (ICDS) and Mid-day Meal (MDM) programme were in operation in Gulbarga district, while ICDS programme alone was in operation in Kolar district. In general, 83% of the HHs having target beneficiaries were participating in these supplementary feeding programmes.

Dietary Situation

Food Intake: The average consumption of various foods (g/cu/day) during drought was compared with that reported by NNMB in its survey carried out during a non-drought period (NNMB-2000-01) and the Recommended

Table 1: Average household consumption (g/CU/day) of foodstuffs

Food Groups	Current survey 2003 (n:200)	NNMB 2000-01 (n:797)	Suggested balanced diets *
Cereals and Millets	457	439	460
Pulses and Legumes	38	38	40
Green Leafy Vegetables	4	11	40
Roots and Tubers	12	45	50
Other Vegetables	11	25	60
Condiments and Spices	12	21	-
Nuts and Oil Seeds	4	0	-
Fruits	10	33	-
Fish and Other sea foods	3	5	-
Other flesh foods	5	4	-
Milk and Milk Products	31	88	150
Fats and Edible Oils	5	12	20
Sugar and Jaggery	18	24	30

Figures in parentheses indicate number.

*Recommended Dietary Intakes for Indians, ICMR, 1981

Dietary Intakes (RDI) (ICMR, 1981). Rice formed the staple diet, while millet ragi was also consumed in varying amounts in both the districts. The average daily consumption of cereals and millets (457 g) and pulses (38 g) during drought was comparable to the recommended levels as well as the figures reported earlier by NNMB. However, the intake of food stuffs, such as green leafy vegetables, roots and tubers, other vegetables, fruits, milk and milk products, fats and sugar, which were well below the RDI, was less than the levels reported during the NNMB survey of 2000-01 (Table 1).

During the current drought, though there was a reduction in the intake of cereals, green leafy vegetables, other vegetables and roots and tubers, but the consumption of pulses, milk and milk

Table 2: Average household intake (CU/day) of nutrients

Nutrients	Current survey 2003 (n:200)	NNMB 2000-01 (n: 797)	RDA
Protein (g)	52	53	60
Energy (Kcal)	1927	2082	2425
Calcium (mg)	457	634	400
Iron (mg)	16	16	28
Vitamin A (mg)	133	210	600
Thiamin (mg)	1.4	1.4	1.2
Riboflavin (mg)	0.7	0.8	1.4
Niacin (mg)	13	13	16
Vitamin C (mg)	14	33	40
Free Folic Acid (mg)	48	50	100

Figures in parentheses indicate number.

RDA: Nutrient Requirements and Recommended Dietary Intakes for Indians, ICMR, 1990

products was surprisingly more than the figures reported during 1987 drought survey (Pralhad Rao, 1989).

Nutrient Intake: The average intakes of all the nutrients, except calcium and thiamin were lower than the Recommended Dietary Allowances (RDA) (ICMR, 1990) (Table 2) The intakes of energy, protein, iron, thiamin, riboflavin, niacin and free folic acid were comparable to the figures reported during the NNMB survey of 2000-01, while the intake of calcium, vitamin A and vitamin C was less.

The average intake of dietary energy in the present survey (1927 Kcal/CU/day) was much lower than the figure (about 2300 Kcal/cu/day) reported during 1987 drought survey (Pralhad Rao, 1989), while a marginal decrease in the

intakes of protein and vitamin A was observed.

The percent distribution of HHs according to consumption of energy, expressed as percent of RDA showed that none of the households were consuming energy < 500 kcal/per cu/day, a level suggestive of starvation diet (Pralhad Rao, 1989), while, this accounted for 1.5% during 1987 drought survey in the State. However, the proportion of HHs consuming <50% of RDA was maximum (93%) for vitamin A followed by vitamin C (80%), free folic acid (61%), riboflavin (55%) and iron (51%).

Household Food Security Status: Nearly half (48%) of the households reported insufficiency of cereals and millets. Food insecurity was reported to be more with respect to expensive foods like vegetables (88.1%), roots and tubers (86.6%), pulses (78.4%), fats (78.1%), milk and milk products (61.2%). As many as 38% of the households reportedly had 50% insufficiency for pulses, while 18.2% reported 75% insufficiency for the same. About a half of the house-holds reportedly had insufficiency of vegetables, roots and tubers. The consumption of milk and milk products was reportedly nil in 46% of the households (Table 3). The proportion of house-holds having insufficiency of these foods during this drought

Table 3: Distribution (%) of households according to current HH food security status (n: 402)

Food group	No change	(% Less than usual			
		25	50	75	100
Cereals and Millets	52.0	37.1	10.9	0.0	0.0
Pulses	21.6	20.4	37.8	18.2	2.0
Vegetables	11.9	11.7	48.8	27.4	0.2
Roots and Tubers	13.4	29.6	49.8	6.5	0.7
Milk and milk products	38.8	3.2	3.2	9.0	45.8
Fats and Oils	21.9	45.5	23.6	5.5	3.5

Figures in parentheses indicate number.

was significantly higher among SC/ST Communities and those HHs engaged in labour activities (Table 4). During the current drought, only 1% of the households surveyed reduced the number of meals from 3 to 2 per day. None of the households reportedly consumed any unconventional or wild foods.

Coping Strategies Adopted During Food Scarcity: The common coping strategies reportedly adopted by the households during the

Table 4: Distribution (%) of households according to current household food security status as perceived by the head of the household: By community and occupation

Food group	Extent (%) of insufficiency	Community			Occupation			χ^2
		SC+ST (155)	BC+ Others (245)		Ag Lab. (158)	Non-Ag lab. (58)	Others (184)	
Cereals and Millets	Normal	36.1	61.6	P<0.01	37.3	46.6	65.8	P<0.01
	< 50%	48.4	30.2		46.8	36.2	29.3	
	≥ 50%	15.5	8.2		15.8	17.2	4.9	
Pulses	Normal	5.8	31.4	P<0.01	8.9	13.8	34.8	P<0.01
	< 50%	21.9	19.2		19.6	20.7	20.7	
	≥ 50%	72.3	49.4		71.5	65.5	44.6	
Vegetables	Normal	4.5	16.3	P<0.01	0.6	6.9	22.8	P<0.01
	< 50%	12.9	10.6		7.6	13.8	14.1	
	≥ 50%	82.6	73.1		91.8	79.3	63.0	
Roots and Tubers	Normal	5.2	18.4	P<0.01	1.9	8.6	24.5	P<0.01
	< 50%	25.2	32.2		24.1	31.0	33.7	
	≥ 50%	69.7	49.4		74.1	60.3	41.8	
Milk and Milk products	Normal	18.7	51.0	P<0.01	21.5	20.7	58.7	P<0.01
	< 50%	1.9	4.1		2.5	1.7	4.3	
	≥ 50%	79.4	44.9		75.9	77.6	37.0	
Fats and Oils	Normal	7.7	30.6	P<0.01	5.7	13.8	38.0	P<0.01
	< 50%	43.2	46.9		50.0	50.0	40.2	
	≥ 50%	49.0	22.4		44.3	36.2	21.7	

Figures in parentheses indicate number.

current drought were reduction in food consumption (96.7%), participation in Government programmes, such as TPDS/AAY (80.5%),

Table 5: Distribution (%) of households according to coping strategies adopted during current drought* (n: 357)

Coping strategies	(%) of HHs
Reduce food consumption	96.7
Obtained Govt./NGO's assistance	80.5
Consumption of low cost food items	64.8
Use of food stocks/ savings	24.9
Borrow cash/food	22.4
Migration	21.5
Selling HH assets	5.3
Others	0.3

Figures in parentheses indicate number.

* Multiple responses

consumption of low cost foods (64.8%), utilization of available food stocks/savings (24.9%), borrowing of cash/food grains from neighbours (22.4%), migration (21.5%) and disposing of household assets (5.3%) (Table 5). Significantly higher proportion of HHs belonging to weaker sections such as SC/ST resorted to consumption of low cost food items, borrowing cash/ food and migration to other places. Similarly, the adoption of coping strategies like, consumption of low cost food items and reduction in the quantities of food consumed was significantly higher among HHs engaged in agriculture labour (Table 6).

Nutritional Status

Table 6: Distribution (%) of households according to coping strategies adopted during current drought by community and occupation

Coping strategy	Community		Occupation		
	SC + ST (151)	BC + Others (208)	Ag.Lab. (158)	Non – Ag.Lab (56)	Others (145)
Use of food stocks / savings	19.2 ^a	29.1 ^b	22.2 ^{ab}	16.1 ^a	31.5 ^b
Consumption of low cost food items	73.5 ^a	58.5 ^b	70.9 ^a	64.3 ^a	58.3 ^b
Barrow cash/food	29.1 ^a	17.5 ^b	20.3 ^a	32.1 ^a	21.0 ^a
Obtained Govt./NGO's Assistance	84.8 ^a	77.4 ^a	79.0 ^a	80.4 ^a	82.2 ^a
Reduce food consumption	98.7 ^a	95.2 ^a	98.7 ^a	96.4 ^{ab}	94.5 ^b
Migration	30.7 ^a	14.9 ^b	22.2 ^a	35.7 ^b	15.3 ^a
Selling HH assets	4.6 ^a	5.8 ^a	6.3 ^a	3.6 ^a	4.8 ^a

Figures in parentheses indicate number.

Figures in the same row with different superscripts under the "community" and "occupation" categories are significantly (P< 0.05) different by proportion test.

Table 7: Prevalence (%) of nutritional deficiency signs among 1-5 year children and adults

Clinical signs*	Pre-School Children (n:679)	Men (n:846)	Women (n:1443)	Pooled (n:2289)
NAD	91.5	96.5	74.2	79.7
Bitot's spots (XIB)	1.5	0.2	1.0	0.7
Angular stomatitis	2.9	0.1	0.3	0.2
Glossitis	1.0	0.0	0.1	0.1
Total Goitre	0.1	0.7	7.2	4.8

Figures in parentheses indicate number.

* Multiple responses

Nutritional Deficiency Signs: The prevalence of clinical signs of nutritional deficiency among pre-school children and adults are presented in Table 7.

None of the preschool children examined exhibited severe forms of protein energy malnutrition, such as marasmus or kwashiorkor. The prevalence of Bitot's Spots, an objective sign of vitamin A deficiency during current drought was much higher (2.9%) than the figure reported for the State (0.3%) by NNMB as well as the WHO criterion of 0.5%, indicating its public health significance for action.

In case of adults, the prevalence of total goitre was about 5%, with higher prevalence among females (7.2%) than males (0.7%), while that of

angular stomatitis and glossitis was negligible.

Anthropometry

Preschool Children: The overall prevalence of underweight (weight for age < Median-2SD) among pre-school children was 58%, while the extent of severe underweight (weight for age < Median-3 SD) was 20%, which was comparable with that reported in NNMB survey (Table 8). No significant association was observed between the overall prevalence of underweight vs community, land ownership and major occupation of the head of the household. However, a marginally higher proportion of children belonging to SC and ST communities (61.1%) and in households of agricultural labour (60.4%) were undernourished as compared to those belonging to Backward and other communities (56.4%) and in households of other occupational categories (56.7%).

Adults: Among adults, the prevalence of Chronic Energy Deficiency, as assessed by BMI (<18.5) during the current drought was significantly ($p < 0.01$) higher (Men: 48.6; women: 51.3) than that reported by NNMB (Men: 36.2%, women: 39.7%) (Table 9). The prevalence of CED was significantly higher among males of SC and ST communities (54%) as compared to those belonging to BC and Other communities (45%), while no such differences were observed among women. No significant differences were observed in the prevalence of CED among households with varying extent of landholdings or major occupations.

DISCUSSION

The primary effect of drought is failure of crops, reduction in agricultural production and increased unemployment among laborers with

Table 8: Distribution (%) of 1-5 year children according to weight for age by standard deviation (SD) classification*

Wt/age	Current survey- 2003 (n: 676)	NNMB- 2000-01 (n: 750)
< Median - 3SD	19.7	17.7
- 3SD to - 2SD	38.5	41.9
> Median -2SD	41.8	40.4

χ^2 : $p > 0.05$

Figures in parentheses indicate number.

* By using NCHS Standards

Table 9: Distribution (%) of adults according to body mass index (BMI)*

BMI Class	Nutritional Grade	Males		Females		Pooled	
		Current survey 2003 (n:845)	NNMB 2000-01 (n:1506)	Current survey 2003 (n:1442)	NNMB 2000-01 (n:281)	Current survey 2003 (n: 2287)	NNMB 2000-01 (n:3637)
< 18.5	CED	48.6	36.2	51.3	39.7	50.3	39.5
18.5 – 25.0	Low Normal	49.3	56.7	45.8	50.4	47.1	53.0
≥25.0	Obese	2.1	7.1	2.8	7.9	2.6	7.6

χ^2 (Current survey Vs. NNMB)

$P < 0.01$

$P < 0.01$

$P < 0.01$

Figures in parentheses indicate number.

* Body Mass Index (BMI): Weight (kg)/Height (metres)²

CED: Chronic Energy Deficiency

direct economic consequences, leading to ill health and undernutrition in the community. The most vulnerable segments of the population to drought are weaker sections of the society, such as those belonging to SC/ST communities, rural landless labourers, marginal farmers and small farmers. In Karnataka, during the past 3-4 years, the average rainfall was reported to be less than normal due to failure of monsoon, leading to severe drought conditions.

Results of diet surveys showed further reduction in the intake of important nutrients like energy, vitamins and nutrients as compared to non-drought period, with marked decline found in the intakes of vitamin A and vitamin C. The drought conditions imposed stress on the households, having already low dietary intakes. The survey revealed that the intake of cereals and pulses remained comparable, while the consumption of protective foods such as green leafy vegetables, other vegetables, fruits, milk and milk products and fats decreased significantly during the current drought as compared to non-drought period. The adverse effect of current drought is reflected by marked decrease in the intake of vitamin A and significant increase in the prevalence of Bitot's Spots among pre-school children. This warrants the need to strengthen the existing massive dose of vitamin A distribution in the drought affected areas.

The survey revealed that the prevalence of undernutrition among pre-school children during drought was similar to that of non-drought period. However, the prevalence of CED among adult males and females was significantly higher during the current drought, which is a reflection of the reduction observed in overall intake of dietary energy among adults. In addition, scarcity of drinking water and shortage of fodder for cattle were also seen during the current drought.

Food insecurity was observed in 60-90% of the households with respect to income elastic foods like milk and milk products, fats and pulses along with those of vegetables and roots and tubers. The consumption of milk and milk products was nil in 46% of the households surveyed. However, none of the households were found to be subsisting on starvation diets (< 500 Kcal/cu/day) during the current drought. Also households consuming unconventional foods such as wild leaves and tubers (famine foods) were not observed during the present survey. It

therefore, appears that the relief of poverty alleviation programmes, such as TPDS/PDS to a large extent, helped protecting the poor community from the impact of severity of drought.

A significantly higher proportion of households belonging to the relatively better off communities, such as BC/Other Communities and also HHs engaged in other occupations, used food stocks /savings to cope with the drought situation. While, the HHs belonging to SC/ST communities and those HHs engaged in agriculture labour used low cost foods as a coping strategy. This reflects the vulnerability of the weaker sections of the society to severe drought conditions. Migration of population to neighbouring States/districts (in 20% of the HHs) reflects the decrease in employment opportunities in the villages and highlights the need for strengthening income-generating activities for the rural poor. It may be mentioned here that the existing food for work programme provided work for a period of 2-3 days only in the households, which participated in these programs.

The present study revealed that significantly higher proportion of HHs belonging to weaker sections of the society was participating in the poverty alleviation programmes such as SGRY and TPDS.

For effective prevention of ill effects of drought, it is suggested to 1) provide entitlement card specifying the eligibility of household for specific poverty alleviation and drought relief programmes, 2) provide employment for at least 10-15 days in a month under food for work programme, for at least one individual per household, particularly of SC/ST communities, landless labour and marginal farmers, 3) enhance the quantity of cereals under TPDS/PDS, 4) implement MDM even during holidays/vacations, 5) strengthen distribution of massive dose of vitamin A under the nutrition prophylaxis programme, 6) provide fodder at subsidized rates and 7) Organize cattle camps through Government/ NGO's/Philanthropic organizations in all drought affected villages.

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