Impact of Drought at Household Level: Field Observations from Aspirational District of Karnataka – Yadgir

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Abstract

About 60 percent of agriculture in Karnataka state is rainfed and thus prone to successive droughts, affecting various aspects of quality of life. There are studies on drought impacts on development, but a few of them have examined its impacts at the household level, for instance on income, nutrition, water, sanitation, health, education etc. This study was undertaken to find out the impacts at the household level and presents the findings, based on a survey of 120 households in 30 villages of Yadgir district (during Feb- April 2019). Yadgir, a northern district of Karnataka was chosen as it is prone to frequent droughts and as a consequent result, has a lower Human Development Index (HDI) than the average HDI of the State. Random selection of households based on their vulnerability to droughts (dependence on agriculture and economic status) was made. Research tools like Checklists, Questionnaires, Focus Group Discussions, Key Informant Interactions were employed to collect the information on the impact of drought. Results have indicated that present drought specific interventions by the State, for instance, Input-Subsidy, increased work-days in Rural Employment Guarantee Scheme etc have helped the community in overcoming drought in that particular year, but not in their coping capacity. On the other hand, measures, such as Integrated Child Development Services (ICDS) were found to have a significant impact.

***Keywords**: Yadgir District, Karnataka, Drought and its Management, Socio-economic Impacts, State Interventions*

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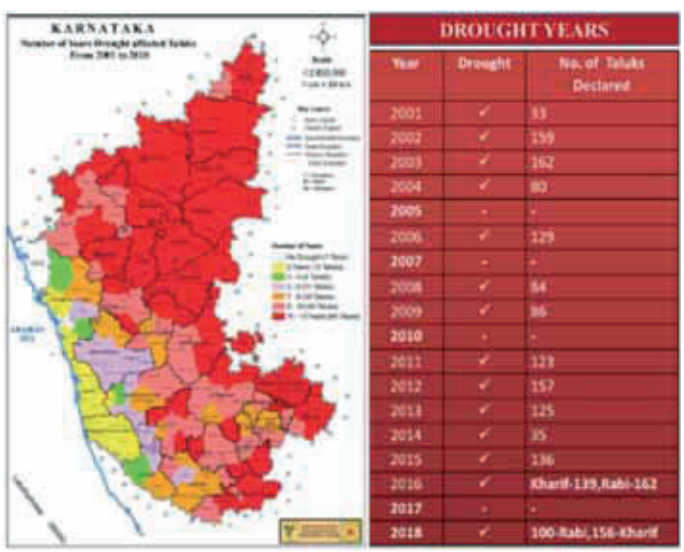
1. Introduction

Karnataka state with an area of 19.1 M ha accounts for 5.8 percent of the total area and 5.05 per cent of the total population of the country, consisting of four major regions namely 1) North Interior Karnataka, 2) South Interior Karnataka, 3) Malnad region and 4) Coastal region. Administratively, it is divided into 30 districts and 176 Taluks, home to 61.5 million people (2011 Census), with a decadal growth rate of 15.7 percent. The State is prone to different natural disasters like droughts, floods, cyclones, hailstorms, landslides earthquakes, etc., but drought is found to cause maximum damage and also impacts large geographical areas within the State. The extent of the affected area, loss of property and socio-economic losses due to different disasters in the State are in the order: Droughts > Floods > Hailstorms > Cyclones > Landslides > Earthquakes (KSDMA, 2016). Nearly 80 percent of blocks in the State are drought-prone. The recurring water scarcities, as Grey (2007) has presented, would impact economic growth and human development and increase the vulnerability of the community. According to the Ministry of Agriculture and Farmers Welfare (MoAFC&W), 16 districts of the state, mostly from North Interior Karnataka, have experienced drought for a period of 10 years during the last 15 years (2001 to 2015).



DROUGHT YEARS		
Year	Drought	No. of Taluks Declared
2001	✓	33
2002	✓	159
2003	✓	162
2004	✓	80
2005	-	-
2006	✓	129
2007	-	-
2008	✓	84
2009	✓	86
2010	-	-
2011	✓	123
2012	✓	157
2013	✓	125
2014	✓	35
2015	✓	136
2016	✓	Kharif-139,Rabi-162
2017	-	-
2018	✓	100-Rabi,156-Kharif

Figure 1: Drought Vulnerability Details (Source: KSNDMC)

Drought, though is a slow creeping disaster, once sets in, is likely to hurt the village economy and the degree of impact depends on the severity of the drought. In rainfed regions, drought may have long-lasting impacts as compared to irrigated regions. For instance, in rainfed regions, if the rains are delayed, those crops with short sowing window may other crops. In such eventuality, the farmer has to arrange for an alternate cropping pattern for instance seed etc. Similarly, any significant deviations even in the number of rainy days or amount of rainfall may have an impact on the crop yield and also on the intensity of farm operations and demand for agricultural labour and ultimately may have an impact at household levels.

Seventh Finance Commission (1980-85), based on the speed of the different disasters, i.e., between rapid (floods, cyclones) and slow (drought) onset disasters, has recommended that in the event of slow-onset disasters like drought, the expenditure of a State, even if it is over and above the margin money, has to be funded out of the contribution from the plan outlay of that State only (Lenin Babu 2019). On the other hand, the adverse impacts of this creeping disaster - drought are many folds (Joshi 2019). Directly, it causes crop loss, scarcity of drinking water, fodder and unemployment in the farm sector. These issues generally are addressed by the State to some extent through Input Subsidy, extending the number of days under Rural Employment Guarantee Scheme etc. At the same time, drought has several indirect impacts as well. For instance, inadequacies in water, sanitation and health (WASH)malnutrition among children and women, higher infant and maternal mortality, high incidence of childhood diseases, school dropouts etc (UNICEF 2016). These indirect impacts are largely ignored but, they tend to have a negative influence on Human Development Index (HDI) (Shivashankar and Ganesh Prasad, 2015; PPMSD 2014, Amarasinghe et al 2020) The Impacts of drought on HDI can be observed as the majority of the North Interior Karnataka districts, that are prone to drought have lower HDI in comparison with other regions of the state (Table 1) Two districts viz., Raichur and Yadgir, which are most vulnerable to droughts have been, are already been categorized as Aspirational Districts by the NitiAayog(NITI 2018 a & b).Though significant research efforts are made into the drought risk reduction measures. The impact of drought on households that are primarily dependent on agriculture has not drawn much attention and therefore, this study.

Table 1: Comparison of Human Development Index in Various Districts

	Human Development Index	Year 2001		Year 1991	
		Value	Rank	Value	Rank
1	Bagalkot	0.591	22	0.505	20
2	Bangalore Rural	0.653	6	0.539	11
3	Bangalore Urban	0.753	1	0.623	4
4	Belgaum	0.648	8	0.545	9
5	Bellary	0.617	18	0.512	18
6	Bidar	0.599	21	0.496	23
7	Bijapur	0.589	23	0.504	21
8	Chamarajnagar	0.576	25	0.488	24
9	Chikmaglur	0.647	9	0.559	7
10	Chitradurga	0.627	16	0.535	13
11	Dakshina Kannada	0.722	2	0.661	1
12	Davangere	0.635	12	0.548	8
13	Dharwad	0.642	10	0.539	10
14	Gadag	0.634	13	0.516	17
15	Gulbarga	0.564	26	0.453	25
16	Hassan	0.639	11	0.519	16
17	Haveri	0.603	20	0.496	22
18	Kodagu	0.697	4	0.623	3
19	Kolar	0.625	17	0.522	15
20	Koppal	0.582	24	0.446	26
21	Mandya	0.609	19	0.511	19
22	Mysore	0.631	14	0.524	14
23	Raichur	0.547	27	0.443	27
24	Shimoga	0.673	5	0.584	5
25	Tumkur	0.630	15	0.539	12
26	Udupi	0.714	3	0.659	2
27	Uttara Kannada	0.653	7	0.567	6
Karnataka		0.650		0.541	

Note: Shaded districts are in North Interior Karnataka and prone to drought
(Source: Compiled from HDI Reports of Districts, published by Planning Dept, GoK)

1.1 Research Objectives

Such a causal linkage between drought and HDI needs a detailed probe. Therefore, this study in the drought-prone district was undertaken to assess the impacts of drought at the household level on various aspects. The focus of the study was more on access to basic services and coping mechanisms at the household level, viz., –income, health, nutrition, education etc. The purpose of the study is to provide insights for concerned stakeholders to devise strategies to help affected community for an effective recovery, mitigation measures and intervention for achieving long-term disaster resilience.

2. Description of Study Area

Yadgir district in the northern part of Karnataka between 16º 11' – 16 º 50' N. latitudes and 76 º 17' - 77 º 28' E. longitudes, has a geographical area of 5234.4 sq. Km (Fig 2). It is predominantly an agricultural district divided into two agro-climatic zones namely eastern transition and northeastern dry zone, indicating the dependence on rain. Though the river Bhima passes through the district, it does not contribute much to the irrigation within the district. However, a distribution canal from Krishna River irrigates two taluks of the district, viz. Surapura and Shahpur. Traditional wisdom has created water storage structures –tanks, to collect and store the run-off. But with advent of modern technologies like bore well, these tanks systems were ignored and were not maintained. According to the Drought Vulnerability Composite Index (DVI) based on the four indices (CI, CSI, CCI and LI), about 33 percent under Class 4 of DVI and 67 per cent under very highly vulnerable class 5. The Normal rainfall of the district is 699 mm but, from the year 2000, the district had drought conditions for 14 years. This factor has its impact on socio-economic conditions with the highest out-migration to Bengaluru, Pune, Sholapur and Hyderabad. The literacy rate is 51.8 percent while female literacy is at 41.8 per cent with 23.2 percent of Scheduled castes and 12.5 percent of Scheduled Tribes (Yadgir District At Glance 2019). Of the three taluks in the district, viz., Shorapur, Shahpur and Yadgir, Yadgirtalukhas the lowest, 30 villages were selected from Yadgir taluk (Yadgir District At Glance 2019).

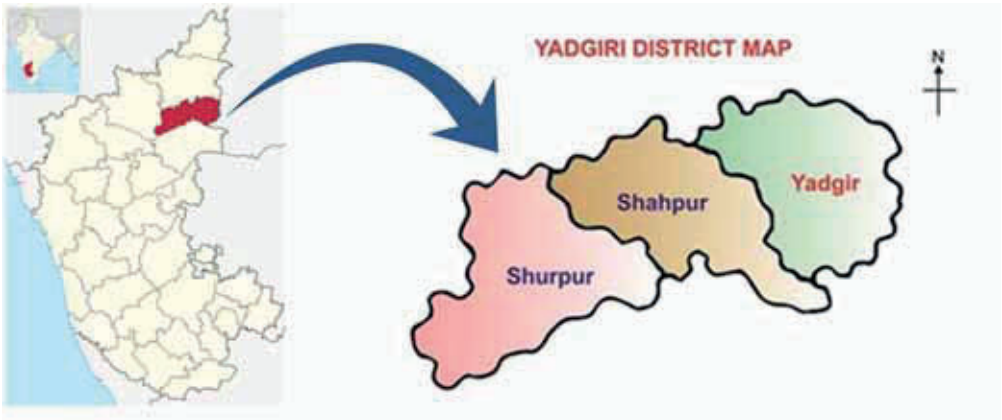


Figure 2: Study Area

2.1 Methodology Adopted

Subscribing to the fact that vulnerability is directly influenced by economic status, a random selection of household was made based on the economic status. Indicators such as landless households, marginal and small farmers in the village were considered for the selection of households. Such households were identified with the help of personnel of Anganwadi Centers. To the extent possible, efforts were made to elicit responses from a female member of the household as they are the first respondents to any drop in income and are more affected. 30 villages were selected across the Yadgir taluk and in each village, seven schedules were used to collect information on vulnerability and coping measures and details are given in Table 2. The fieldwork was conducted during March-April 2019.

Table 2: Research Tools Employed

Sl.	Schedule/ Checklist	Information Sought	Mode of Information Collection	Total Number
1	Village Information	Physical and Social Infrastructure of Village	FGD and Key Informant Interaction	30 Villages
2	Anganwadi Center Information	Details of ICDS Services Provided and Beneficiaries	Questionnaire	30 Anganwadi Centers
3	School Information	Availability of Water for Drinking and Sanitation Purposes	Questionnaire	30 Schools
4	Household Information	Impact of Drought on Children	Questionnaire	30 Households
		Impact of Drought on Adolescent Girls	Questionnaire	30 Households
		Impact of Drought on Pregnant Women	Questionnaire	30 Households
		Impact of Drought on Lactating Women	Questionnaire	30 Households
		Total Schedules		210

3. Results

Along with other damages, disasters tend to damage the livelihood support base of the ecosystem. Such damages may reduce the coping capacity of the affected community and increase their vulnerability. Hence, more attention was given to the details of the livelihood support base in the sampled villages, i.e., agriculture. As drought has a direct influence on agriculture, on the yield and farm employment. It also has a tangible influence on animal husbandry, these three issues were probed in detail.

3.1 Drought and Livelihood

In all 30 villages, agriculture is the mainstay of activities. Out of the total 120 households interviewed, 93 households have owned agricultural land while 27 families do not own agricultural land. Out of the landowning households, about 48 households have owned irrigated land and about 45 households own rainfed land only. Approximately

11 households own both irrigated and rainfed lands. The Average landholding in case of the irrigated lands was 1.15 acres and for rainfed land, it was 1.36 acres. The highest rainfed landholding was recorded in village Alipur with 10 acres. For irrigated land, highest landholding at 6 acres was recorded in the village Vagalapura, indicating the vulnerability of the farming community. In addition to their own cultivation, all households engage themselves as farm labour as well. Agriculture is the primary livelihood for the majority of households (75%). During normal monsoon years, respondents opined that, agriculture provides gainful employment from two to ten months and is a significant source of household income. However, during the poor monsoon (drought years), employment potential drops drastically and forcing them to seek livelihood options elsewhere like textiles industries in Sholapur or construction sector in Bengaluru city or other urban centres(Table 3).

Table 3: Contribution of Agriculture to Family Income

Per cent of Contribution	**Number of Families (%)**
0 to 30	28
31 to 60	42
More than 60	30
Gainful Employment from Farm Operations during Normal Year	
% of Households	**Gainful Employment in Months**
5	0
40	6
42	10

(Source: Primary Survey)

In terms of monthly income, about 13 households, the average monthly household income was up to Rs. 3000. For 55 households, average monthly income reported being between 3000 to 5000. For 10 households, the average monthly income is more than Rs. 5000. The average monthly income of all households of the survey was Rs. 4600/- About 40 households have declined to divulge the income details.

3.1.1 Yield Reduction

Due to the drought, it was observed during the study that both irrigated and rainfed field was affected. In the case of the former, it was due to inadequacy of water for irrigation and in the latter case, it was on account of the uneven distribution of rainfall, resulting in damage to standing crop during the onset of the inflorescence. This resulted in significant yield reduction, more than half of the normal yield, and in turn, reduction of farm income. Ramasamudra, Malappanahalli, Jinikere, Kaulur are some of the villages that have registered higher yield losses in farm production. Bandalli, Bachivara villages have reported a moderate reduction in farm production due to the drought and households in Bachivaratanda have reported a lower quantum of yield reduction due to drought. Overall survey results indicate that there has been a reduction in farm yield up to 51 percent (Table 4).

Table 4: Reduction in Agricultural Yield Due to Drought

Per cent of Households	Per cent Reduction in Agricultural Yield
13	Upto 30
47	30 – 60
24	More than 60
15	No Impact

(Source: Primary Survey)

3.1.2 Reduced Demand for Farm Labour

For landless and marginal farmers, farm labour is an important source of income. Drought has a direct and negative impact on demand for farm employment. The drought resulted in subdued farm activities and so was the demand for farm labour. This has resulted in the shrinking of the livelihood support base of landless and marginal farmers. An attempt is made to estimate the extent of the drop in farm labour (Table 5). For more than 60 percent of households, the loss of income due to drought was about 60 percent.

Table 5: Impact of Drought on Farm Labour Demand

Number of Households (%)	A Decline in Income (%)
27	Upto 30
55	30 – 60
15	More than 60
3	No impact

(Source: Survey)

3.1.3 Animal Husbandry

Traditionally, animal husbandry is an integral part of the farming system in India. Crop residue, for instance, rice straw or maize stalks etc, serve as fodder to livestock and in turn livestock providing manure, traction power and dairy products such as milk, meat etc. Livestock owning pattern and impact of drought on the livestock was collected during the study and details are as follows.

Mulch Animals: About 40 percent of households reported to own livestock. On an average, each of these households own about 3 animals each. Out of the livestock families owning households, 71 percent own cows/buffalos and milk is consumed at household levels (25nos). About 10 households reported that they sell milk to the market also. Preferred feeding practices for livestock is stall feeding for oxen/bullocks and grazing in common property resources (CPR) for cows/ buffalos and Goat, Sheep. It was opined by respondents that even before the drought was declared by the government, livestock faces problems due to shortages of water and fodder. But, only a minuscule portion of households (only 2 out of 49 households) have made use of the 'Goshala' (Cattle camps) and fodder banks established by the Department of Animal Husbandry. Primary reason quoted for this was their location of or the logistical problems. For about 95 percent of the households, help from friends/relatives to purchase fodder to tide over the drought was a primary coping measure. Similar responses were recorded from sheep and goat farming households.

Thus, drought has affected both primary and supplementary sources of livelihood, viz., a) farm yield, b) farm labour and c) livestock. In addition, it has impacts on social capital as described in the following sections.

3.2 Effect on Social Aspects

During the Interaction with 120 households, an assessment was made with reference to their social environment and how the drought has affected it. Each household was requested to share their personal experiences of drought with reference to their day to day life, for instance, prioritisation, resilience, coping mechanisms adopted etc. For 12 percent of households, the impact of drought was minimal as they draw their sustenance from the organized sector. About 61 percent of households expressed that they are forced to reprioritise due to drought. For about 27 percent of households, drought has forced them to alter plans of asset procurement and/or postpone events.

3.2.1 Impact of Drought on Food Basket

Drought induces changes in food basket due to a) reduced household income and also b) non-availability of certain farm products. In about 49 percent of households, number and quantity of animal protein were intentionally reduced, and for 26 percent of households, the impacts were moderate as they have reduced the consumption of animal protein and also lentils. For 16 percent of households, the food basket has significantly reduced to cut the costs. For two percent of households, the changes were extreme (Table 6). Despite awareness about the adverse impacts of malnourishment, the survey indicated that households were helpless.

Table 6: Impact of Drought on Food Basket

% of Households	Forced Food Basket Change
7	No Change
49	Nominal Change
26	Moderate
16	Significant
2	Extreme level

(Source: Primary Survey)

3.2.2 Drought and Water

Yadgir region was prone to droughts and to overcome drought and drought-like situations, in the traditional wisdom,emphasis was given to the construction of surface

water storage bodies. Over the years, these traditional water harvesting systems have deteriorated as borewells became primary sources even for day to day water requirement. Point of water collection was a public point with less than two percent of respondents have a private water supply. Every year during summer months, water supply through tankers is required in a few villages, viz., Ramasamudra, Jenikere, Kaulur, Nagalapura, and Venketashapura villages, constituting about 12 percent of respondents. In a drought year, Potable Water Supply System ((PWS) was able to meet cater to the water demand for only 40 percent of respondents and for about 60 percent of respondents, water supply through Tankers by the district administration is the only source. The uncertainty of tanker timings interferes with several other activities and inadequate water supply forces compromises with personal hygiene. Results indicate that every household faces water shortage of about 31 percent (about 100 l shortage per day) (Table 7), forcing them to collect water from far off borewells or wait a long time for the water tankers.

Table 7: Water Demand and Availability Details

	Normal Year	Drought Year
Average Water Requirement for Domestic Purpostes (l/day)	440	380
The Average Amount of Water Available (l/day)	350	260
% of the Inadequacy of Water	18	31
% of Intentional Reduction in Water Demand During a Drought Year		20

(Source: Survey)

Implications of the Inadequacy of Water: About 45 per cent of households have compromised with poor quality of water. Regarding the changes in quality of water, 54 percent of households felt there was a marginal change in the quality of water during a drought year, 39 percent felt that they experience a considerable change in water quality during a drought year, but for six percent, significant change is the norm.

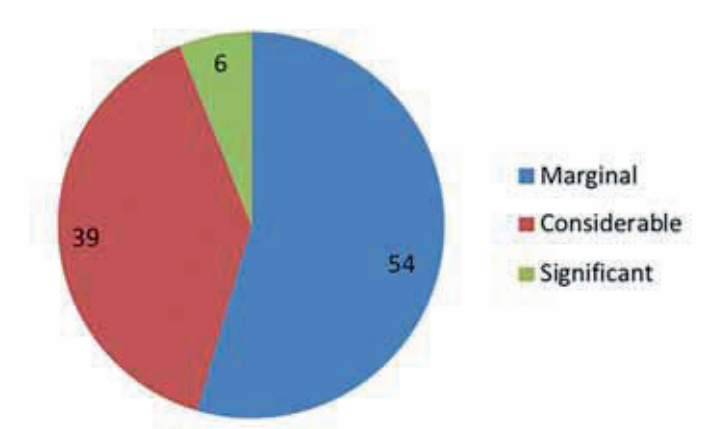


Figure 3: Deterioration in Water quality (% of Households)

About 50 percent of households have indicated that they have spent additional money on the water during the drought years on one hand and reduced consumption on the other. About 35 percent of households took the help of their children, particularly, a girl child in fetching water for domestic purposes. Petty clashes, according to 76 percent of respondents, were common during the collection of water. Another significant impact of water shortage was observed in the form of reversal to Open Defecation Practice.

3.3 Drought and Health

As mentioned in earlier sections, in the sampled population, landholding is low and agricultural labour is a major source of income. Drought conditions have resulted in a significant reduction in demand for agri-labour which has resulted in reduced household income of agricultural labour. Assuming a direct relationship between reduced income and food consumption and health, enquiries were made to understand the impact of drought on household nutrition.

3.3.1 Drought and Nutrition

Regarding our enquiries about hunger and any member of household forced to remain hungry, 29 percent of households preferred not to reply while 43 percent of households opined that it was not an issue. But 27 percent of households, replied that there were instances that a member or two of the family slept with hunger due to inability to

find employment to generate resources. Households from Mandargi, Gowdagere, KanchagaranalliTandavillageshave reported such instances. Drought conditions are known to affect the quantity and quality of farm products like vegetables and tend to influence the availability as well as the prices. To capture consumption changes induced by drought, respondents were asked about changes in their food basket influenced by drought conditions. Only 46 households have replied to quarry and 23 percent of households have reported some changes in their food basket, primarily as a means to cut down expenses. Respondents from Ramasamudra, Kaulur and Vadnalli reported significant changes in their food basket. Enquiries were made about the impact of the drought on diet provided to children. Household members have accepted that drought has resulted in decreased feeding to the children. Measures to tide over the drought conditions varied from shift to cheaper food items, reducing the quantity of food intake, taking loans from friends and relatives etc (Table 8). Taking loans to purchase food grains was adopted by a maximum number of households (88%).On the other hand, about 82 percent of households have mentioned that migration to urban centres for unskilled work offers an attractive alternative route to escape from the drought conditions. Only 17 percent of households have felt that migration is not an answer to the drought. Bengaluru remained the most preferred place of migration followed by Mumbai. Hyderabad was the least preferred.

Table 8: Measures Adopted to Overcome Drought and Malnutrition

Sl. No.	A shift to less preferred and less priced food items	Reduction both in quantity and number of meals	Procuring foodgrains on loan from friends/ relatives	Consumption of seed materials	Taking loans to procure food grains	Distress sale of livestock, household items etc	Dependence on Mid Meal Scheme for children	AWC support for mother
No of Households	54	42	97	97	105	96	62	48
Percent of Households	45	35	81	81	88	80	52	40

Respondents were asked to their opinion on the efficacy of the various measures undertaken by the government to mitigate the drought. Afforestation program was

in general and more specifically in common property resources were suggested as measures to provide good impacts. It was followed by measures such as agro-forestry and shift to less water demanding crops (Table 9).

Table 9: Opinion of Respondents to Prevent/Mitigate Drought

Sl. No.	Afforestation	Agroforestry	Aforestration in Common Property Resources	Optimum use of Groundwater	Shift to Less Water Demanding Crops	Changes in Copping Pattern
No of Households	73	67	69	63	64	58
% of Households	61	56	58	53	53	48

About the benefits taken from the Anganwadi Centers (AWC), Health Referral Services and healthcheck-up services were availed by most of the respondents (85 and 84 percent respectively), About 83 percent of households availed the nutritious food from AWC. Children from 66 percent of households were sent to Pre-school Education by AWC. About 10 households were covered under the Bhagyalakshmi Stcheme.

Table 10: Benefits Availed by Members of Household

Sl. No.	Nutritious Food	Immunisation	Health Checkup*	Health Referral	Pre-school Education	Bhagyalakshmi
No of Households	99	79	101	102	79	12
% of Households	83	66	84	85	66	10

*From AWC

3.4 Drought and Pre-School Education

Before a child can be sent to school, the child should be school-ready. School readiness has three dimensions, viz., a) Child Readiness (help children to be ready to get exposed to the school environment, b) School Readiness: (focusing on the school environment along with practices that foster and support a smooth transition for children into primary school and advance and promote the learning of all children, and c) Family Readiness (focusing on parental and caregiver attitudes and involvement in their children's early learning and development and transition to school) (UNICEF, 2019) and this survey has looked into these factors as well. The smooth and efficient functioning of the AWC is the result of several factors, such as water, playground, space for preparation of food, WASH facilities etc. A survey of 30 AWC was made to assess the status of these facilities available.

3.4.1 Water

Adequate quantity of water supply is essential for everyday operations of AWC. Water is required for the drinking purposes of children, preparation of food and also for the WASH activities. Survey results suggest water supply is a concern in the majority of AWC that operate from private buildings and intensifies during summer months and drought years. For those AWCs that are operating from school premises or in close proximity, water is procured from the water source of the school itself and hence, water procurement is not a concern. On the other hand, AWC functioning away from the school premise have to depend on other sources of water, i.e., Potable Water Supply system. Due to limited supply in PWS, water has to be collected at a particular time and store in AWC. For some AWCs, it was observed that the tap connection is more than 300m away, resulting in hardship in collecting the water (Figure 4). This, in turn, found to result in discouraging children to use water, affecting WASH activities. Water storage is also a concern for those AWCs which collect water either from PWS or borewell. It was observed during the survey that with little more care, the quality of potable water can be maintained throughout the day.

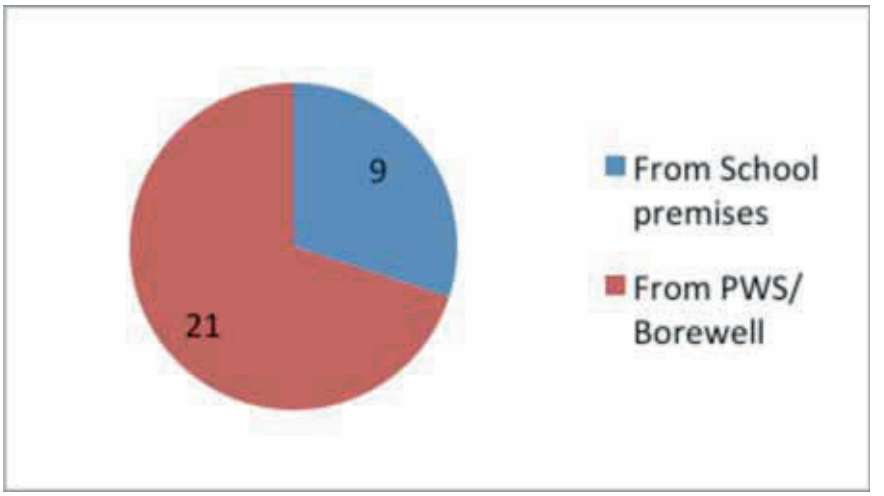


Figure 4: Water Source for AWC

4. Coping Measures

Coping Measures adopted for overcoming the drought varied from consuming less food to shift to low-cost food items to considering the distress sale of livestock to exploring the child employment. Most of the households have adopted to reduce the expenditure to tide over the drought and shifting to low-cost food items found to most often resort measure. However, this solution appears to be the source of several other problems and beginning of deepening crisis (Figure 5).

4.1 Seeking Help from Government

53 percent of household expressed willingness to register with the government for drought relief and participate in MGNREGA activities. However, 31 percent of respondents were against this idea and wanted to resolve problems on their own. About 34 percent of households took financial help from friends/ relatives while all others have taken a loan from individuals with interest.

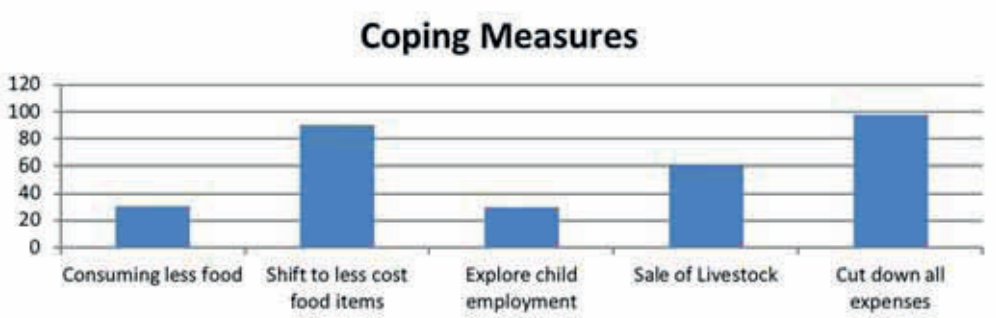


Figure 5: Coping Measures Considered by Households (in %)

4.2 Efficacy of Drought Proofing Measures

During the survey, respondents were requested to provide their opinion about the efficacy of drought-proofing measures implemented by the government such as desiltation of tanks, water supply through tankers etc. Among various measures, new borewells in water-scarce villages were appreciated by maximum respondents (98%). It was followed by the tank desiltation measures (89%) and water supply through tankers was welcomed by 82 percent of respondents. Agricultural extension services were appreciated by only 46 percent of respondents. There were some respondents opined that desiltation measures are very beneficial, but their efficacy to deal with drought conditions is limited due to a) limited area of tanks influence and b) lack of appropriate means to harvest groundwater with farmers, belonging mostly to marginal and small farmer category (Table 11).

Table 11: Perceptions on the Efficacy of Drought Proofing Measures (in %)

Measure	Effective	Not so Effective
Tank Desiltation	89	11
Water Supply through Tankers	82	18
New Borewells in Water-scarce Regions	98	0
Agricultural Extension Services	46	54
Input Subsidy	55	45

(Source: Survey)

4.3 Efficacy of Drought Proofing Measures

During the survey, respondents were requested to provide their opinion about the efficacy of drought-proofing measures implemented by the government such as desiltation of tanks, water supply through tankers etc. Among various measures, new borewells in water-scarce villages were appreciated by maximum respondents (98%). It was followed by the tank desiltation measures (89%) and water supply through tankers was welcomed by 82% respondents. Agricultural extension services were appreciated by only 46 per cent of respondents. There were some respondents opined that desiltation measures are very beneficial, but their efficacy to deal with drought conditions is limited due to a) limited area of tanks influence and b) lack of appropriate means to harvest groundwater with farmers, belonging mostly to marginal and small farmer category (Table 12).

Table 12: Perceptions on the Efficacy of Drought Proofing Measures (in %)

Measure	Effective	Not so Effective
Tank Desiltation	89	11
Water supply through Tankers	82	18
New Borewells in Water-scarce Regions	98	0
Agricultural Extension Services	46	54
Input Subsidy	55	45

4.4 Recommended Future Research

This research, based on the survey of 120 households in Yadgir district, finds that drought has very adverse impact lower income sections of society as they are most vulnerable with lower levels of resilience. As majority of area comes under rainfed cultivation system and drought conditions being inevitable part of climate changes, most suitable adaptations would to develop coping measures either in terms of changes in cropping pattern or in terms of diversification of livelihood. Again, the regional conditions vary significantly and therefore, future research may focus on these two specific aspects, but with focus on local, if possible, or regional conditions.

5. Conclusion

Yadgir district is known for its Red Gram and Jowar crops but persistent drought conditions have credited this district with a notoriety of low Human Development Index (HDI) in the state. Drought has not only pushed the district into the list of Aspirational Districts but to at 101st position in 2nd Delta Ranking during 2019. According to Karnataka State Natural Disaster Monitoring Center data, from the year 2000, the district has witnessed drought for almost 14 years. The frequency of drought recurrence is such that, it is not far from fact to say that children below 16 years in Yadgir district have not yet got a chance to experience how a normal monsoon year would be.

Government efforts constitute a) desiltation of surface water bodies, b) recommendations from the district contingent cropping plan, c) employment under MGNREGA etc., on the other hand, community efforts to cope with drought have dropped to almost nought and out-migration remains as the most preferred strategy to be employed in the event of drought. Such a situation warrants another paradigm shift to risk reduction strategies.

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