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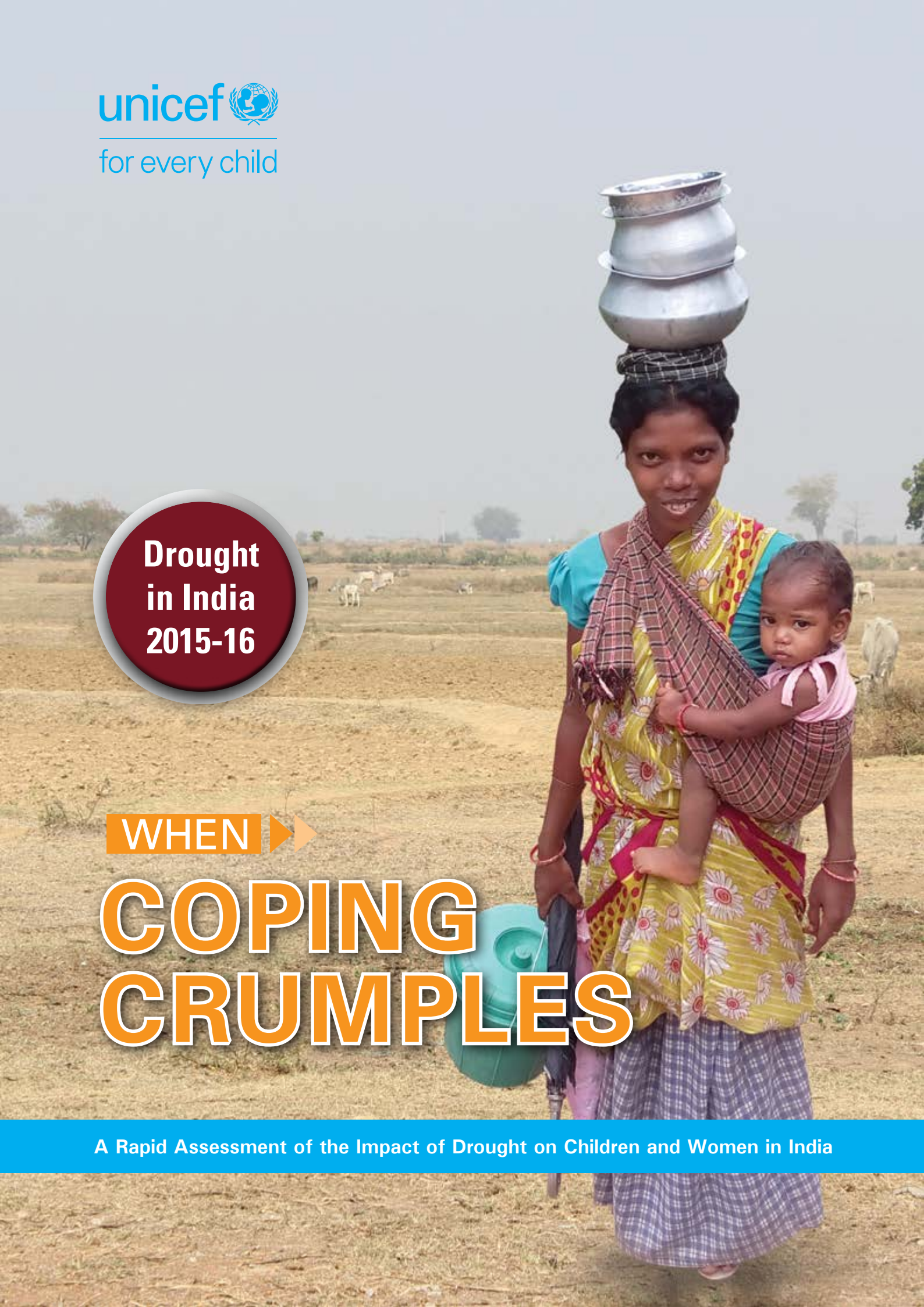

Drought in India 2015-16

WHEN COPING CRUMPLES

A Rapid Assessment of the Impact of Drought on Children and Women in India

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Disclaimer:
The assessment was commissioned by the DRR section of UNICEF India Country Office and carried out by RedR (Registered Engineers for Disaster Relief, UNICEF state offices and consultants). The entire process was guided by the respective state offices in each state. Ten teams, comprising more than 50 thematic experts, visited 8 states, covering 23 districts, 59 blocks, and 159 villages. This report presents the consolidation of eight individual state reports.

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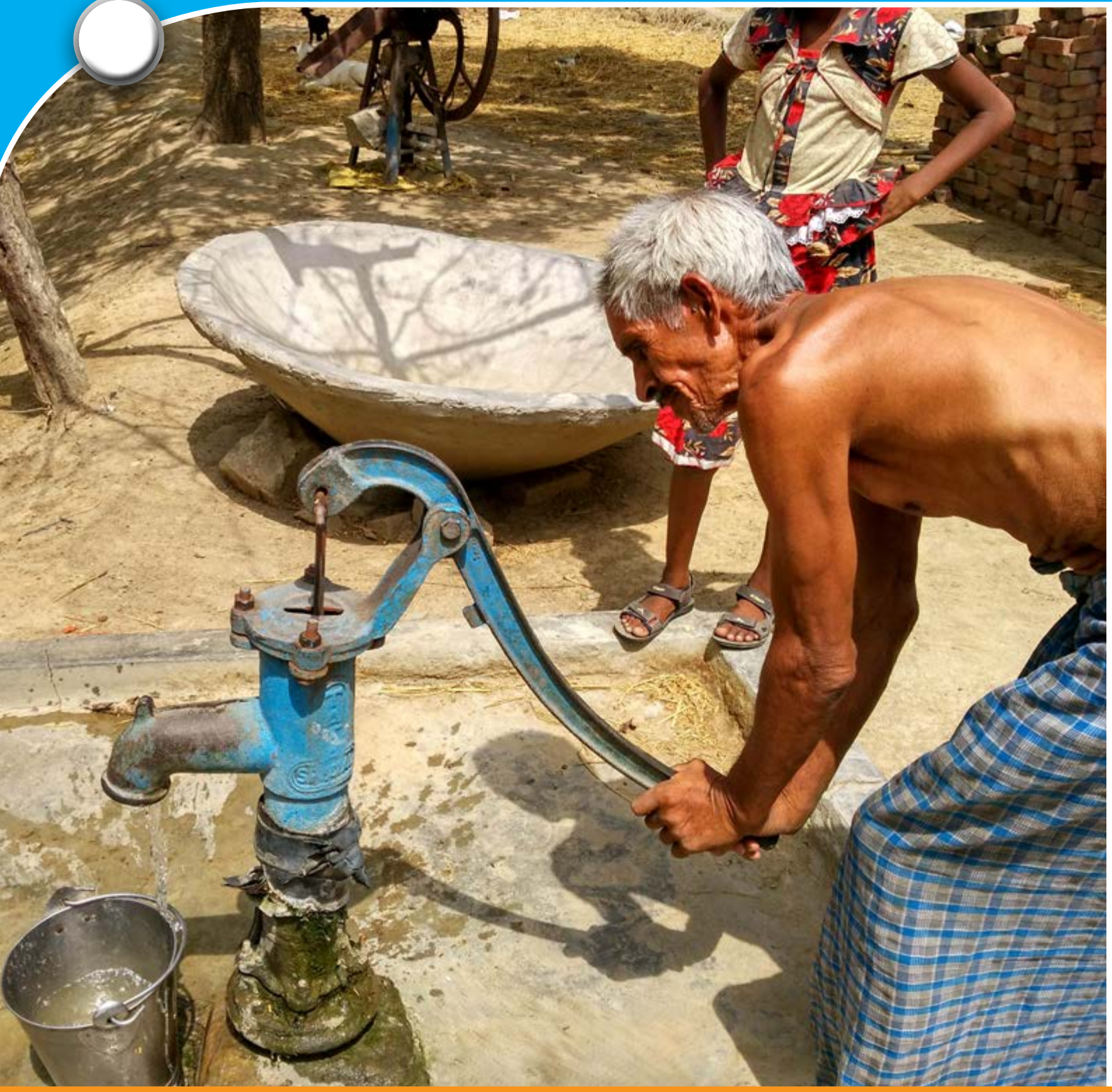
ACRONYMS
AND ABBREVIATIONS

AAY	Antyodaya Anna Yojana
ASG	Additional Solicitor General
ASHA	Accredited Social Health Activist
AWC	Anganwadi Centre
AWW	Anganwadi Worker
CBO	Community Based Organisation
CH	Cottage Hospital
CPC	Child Protection Committee
CSR	Corporate Social Responsibility
DDMA	District Disaster Management Authority
DM	District Magistrate
DMP	Disaster Management Plan
DRR	Disaster Risk Reduction
FGD	Focus Group Discussion
GAM	Global Acute Malnutrition
GoI	Government of India
GPDP	Gram Panchayat Development Plan
GW	Ground Water
HH	Household
IAY	Indira Awas Yojana
ICDS	Integrated Child Development Scheme
ICO	India Country Office (UNICEF)
ICPS	Integrated Child Protection Services
IEC	Information Education Communication
IMD	Indian Meteorological Department
KII	Key Informant Interview
MAM	Moderate Acute Malnutrition
MDM	Mid-Day Meal
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MHM	Menstrual Hygiene Management
MIS	Management Information Systems
MP	Madhya Pradesh
MPLAD	Member of Parliament Local Area Development (Fund)
MUAC	Mid-Upper Arm Circumference
NDDB	National Dairy Development Board
NGO	Non-Government Organisation
NIDM	National Institute of Disaster Management
NRC	Nutrition Rehabilitation Centre
NRLM	National Rural Livelihoods Mission
NTFP	Non-Timber Forest Produce
OD/ODF	Open Defecation/ Free
ORS	Oral Rehydration Salts
PDS	Public Distribution System
PHC	Primary Health Centre
PHED	Public Health Engineering Department
PPP	Public Private Partnership
PRI	Panchayat Raj Institutions
RWSS	Rural Water Supply and Sanitation
SAM	Severe Acute Malnutrition
SAPCC	State Action Plan for Climate Change
SDMA	State Disaster Management Authority
SHG	Self Help Group
SO	State Office (UNICEF)
SOP	Standard Operating Procedures
UTI	Urinary Tract Infection
WASH	Water, Sanitation and Hygiene
WCD	Women and Child Development

GLOSSARY



DEFINITIONS OF KEY TERMS USED

Meteorological Drought: A situation where there is a reduction in rainfall for a specific period (days, months, seasons, or year) below a specific amount (long term average for a specific time).

Hydrological Drought: Hydrological drought is associated with reduction of water. A meteorological drought often leads to hydrological drought. Generally, it takes two successive meteorological droughts before the hydrological drought sets in. There are two types of hydrological droughts, that is: (i) surface water drought, and (ii) ground water drought.

Agricultural Drought: This concerns the impact of meteorological or hydrological drought on crop yield. When soil moisture and rainfall conditions are not adequate to support a healthy crop growth to maturity, thereby causing extreme moisture stress and wilting of major crop area, they lead to agricultural drought.

Socio-Economic Drought: This reflects the reduction in availability of food and income loss because crop failures, endangering food and social security of the people in the affected areas.

Severe Acute Malnutrition (SAM): Severe acute malnutrition is defined by a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional oedema. **A child is considered SAM if he/she meets any one of these criteria or combination of these:**

- Weight-for-height z-score (WHZ) is less than -3SD, or
- MUAC is less than 115 mm, or
- Presence of bilateral-pitting oedema.

Moderate Acute Malnutrition (MAM): Also, known as wasting, this is defined by a weight-for-height indicator between -3 and -2 z-scores (standard deviations) of the international standard or by a mid-upper arm circumference (MUAC) between 11.5 cm and 12.5 cm. A child is considered MAM if he/she meets any one of these criteria or both:

- Weight for height z-score is between -3SD and -2SD, or
- When MUAC is between 115mm - <125 mm

Global Acute Malnutrition (GAM): This is the sum of the prevalence of SAM plus MAM at a population level. GAM includes all the children with weight for height z-score of less than -2SD, or MUAC is less than 125 mm with presence or absence of bilateral pitting oedema.

Mid-Upper Arm Circumference (MUAC): MUAC is measured in millimetres on the left arm, at midpoint between the shoulder's tip and the elbow, on a relaxed arm.

Stunting: Proportion of children less than 5 years of age with length or height for age < -2 z-scores of the median WHO child growth standards.

Underweight: Proportion of children less than 5 years of age with weight for age < -2 z-scores of the median WHO child growth standards.

EXECUTIVE SUMMARY

Rationale

Drought is a complex, slow-onset phenomenon of ecological challenge that affects people more than any other natural hazards by causing serious economic, social and environmental losses. In 2014-15, India had a 12 percent deficit in rainfall, followed by a 14 percent shortfall in 2015-16. As per the response filed by the Ministry of Agriculture and Farmer's Welfare, Government of India, in the Rajya Sabha on the 29 April 2016, 266 districts across 11 states have officially declared drought in 2016. Some of these districts were experiencing repeated droughts over the past two to three years (Andhra Pradesh, Karnataka, Maharashtra, and Uttar Pradesh,) leading to serious food and drinking water security concerns.

Above all due to population rise, per capita annual water availability has seen a reduction by 300 cubic meters in one decade (2001 to 2011). Over and above there are huge disparities in access to water, which are true reflections of wider equity issues and deprivations that rural and poor people in India face on a day to day basis. All related vulnerabilities and water stress are further influenced by climate variability under the impact of global warming. In many of these regions it is necessary to place drought in the wider patterns of climate change, cropping, migration, environmental degradation and socio-economic trends that have emerged over a decade or two.

A total of 330 million people, a quarter of India's population, have been affected by the drought of 2015-16. The drought has had an impact on 2, 55,923 villages in 254 districts of 10 states.

(Indian Express Newspaper, 20 April, 2016, citing Additional Solicitor General- P A Narasimha, appearing for Government of India in the Supreme Court)

Drought in India is a regular event occurring almost every year in some Indian states. Because droughts are a normal part of virtually any climate, it is important to develop plans to reduce their impacts. However, Drought declaration and response management in India have always been a large and complex operation, requiring close, often challenging, coordination between various government levels. It has been observed that affected rural communities suffer from scarcity of drinking water, non-availability of fodder for cattle, migration along with families, and increased indebtedness. Each of these situations has a negative impact on education, nutrition, health, sanitation and the care and protection of children.

In the backdrop of the 2015-2016 drought, the Supreme Court of India, in its land mark judgment, directed the Union Government to revise the Drought Management Manual before the end of 2016, giving due weightage to the four indicators of drought with fixed determinants. These indicators are rainfall, storage water level in reservoirs, surface water and ground water levels, and sowing and crop conditions. It also directed the states and the Centre to use technology for timely assessment of drought conditions. The Supreme Court observed that the adverse or negative impact of a delayed declaration of drought affects the people, particularly women and children, and postpones the required assistance.

The Supreme Court intervened in this situation because many states have been experiencing poor rains over the last three years and felt that more action was needed from the

government to address the challenge. The rainfall deficit has impacted communities severely and prompted extreme measures from local governments including introducing water use restrictions, positioning armed guards at water reservoirs, and sending water trains to the worst-affected regions. Large number of families that are dependent on rain for their livelihoods have been hit by the drought for three years in a row and have run out of coping mechanisms. The ecosystems that provide resilience to marginal farmers have lost their capacity under many decades of unsustainable development practices. Vulnerable rain-fed farmers struggle to adapt to climate changes, particularly due to lack of awareness, preparedness and measured response which increases the risk of exposure to drought and its latent intensity. For children, who are among the most vulnerable groups the impacts are numerous; 'cumulative shocks mean cumulative impacts[1]'.

A piece of evidence from a 2001 study[2] provides credence to the landmark judgement from the Supreme Court of India: "Disasters are seen to impact the health of children and women in a short and medium term, particularly in the rural areas adversely, where protracted development deficits led lack of access to health care results in morbidity and lack of immunization against vaccine-preventable diseases. A natural disaster in past month increases likelihood of diarrhoea, fever and acute respiratory illnesses by 9-18 percent. Additionally, it reduces height - for-age and weight - for-age z scores by 0.12-0.15 standard deviations, increases likelihood of stunting and underweight by 7 percent and reduces the likelihood of having full age-appropriate immunization coverage by 18 percent."

Against the background of this repetitive drought and drought-like situation in many states of India over the last few years, UNICEF's India Country Office sought to improve its first-hand understanding of the direct and indirect impact of drought on children and women and the Government programmes to lessen the negative impact. A rapid drought impact assessment was therefore carried out in eight states[3], with the aim of providing insights into drought management practices and their effectiveness, and to identify UNICEF's role in supporting efforts to achieve long-term climate and disaster resilience. A contextual analysis was done of drought and drought like situation over the past three to five drought years explaining its impact on women and children within the overall build-up of stress due to various factors like climate variability, unstainable development decisions, and environmental degradation.

Objectives of the Assessment

1. Assess the impact of current drought or drought like situations due to water scarcity and its related manifestations on communities, particularly children and women, in terms of access to basic services and coping mechanisms.
2. Assess the impact of current drought or drought like situation due to water scarcity and its related manifestation on UNICEF supported programs, particularly the achievement of the five programming priorities.
3. Appraise drought related governance systems at district, state and national level to identify system strengthening needs in terms of planning, climate adaptation, preparedness and response.
4. Provide recommendations to district administrations, state governments and UNICEF towards its current/routine and future programming.

[1] "Unless We Act Now", 2015, UNICEF

[2] *The Impact of Natural Disasters on Child Health and Investments in Rural India*, Ashlesha Datar et al, May 2011

[3] Maharashtra, Bihar, Madhya Pradesh, Chhattisgarh, Telangana, Rajasthan, Jharkhand, and Odisha; in the sequence of mission start dates.

SUMMARY OF FINDINGS

It was observed that prolonged development deficits created by lack of infrastructure, inappropriate service delivery mechanisms, unsustainable development practices and inadequate social safety nets coupled with declining community based coping mechanisms have increased insecurities and hardships for children, women and their families. Extended or repeated exposure to drought ends up exacerbating these inherent vulnerabilities. As the study confirmed, 'drought' is created by the same socio-political processes that perpetuate vulnerabilities and their consequences. Within the complex drought picture composed of a multitude of causal factors, the consequences, as revealed by the assessment, were clear: hunger and drinking water stress created by unsustainable development practices.

In the 2015 Global Hunger Index (GHI) report, India is ranked at the 29th spot, which is rated as serious[4]. A joint malnutrition dataset from UNICEF, World Bank and WHO for the year 2016 indicates that the prevalence of severe wasting among children under the age of 5 was 4.6 percent, wasting 15.1 percent, stunting 38.7 percent, and underweight 29.4 percent[5]. It is established that there is a clear link between child malnutrition and poor sanitation, which is again closely linked to access to water. WHO estimates that 50 percent of malnutrition is associated with repeated diarrhoea or intestinal worm infections from unsafe water or poor sanitation or hygiene.

Reduced availability of water for domestic consumption, livestock and subsistence agriculture was directly affecting the personal hygiene, environmental sanitation, livelihood and nutrition support for distressed rural families and particularly women and children. Women in rural India wake up first in the family to tend to daily domestic chores and sleep the last. During the drought, they walk the farthest to fetch water but eat the least to ensure that the children and the males are fed well.

Education of children was awarded low priority as families migrate out of their villages in search of subsistence livelihoods. The situation of scarcity further erodes the protective environment for children. Drought affects children not only during the disaster but also leaves a life-long impact on the realisation of child rights and future development.

It is alarming that almost 40 million children under five years (U-5) of age[6], in the rural areas of the eight states visited, were identified as being under the throes of drought during the period of data collection (June-July 2016). If the situation is not addressed in time, each time drought happens these U-5 children be impacted in their physical and cognitive development may lead an under-developed life in the years to come.

The distress experienced by small and marginal farmers has now spilled over to the landless labourers and allied workforce. This is manifested in additional drudgery and despondency, particularly for women and children in the drought affected districts. Three consecutive years of rain stress have resulted in depleting ground water tables, consistent crop failures and a fall in food options, which compromises the potential to achieve the envisaged results for women and children, as seen in almost 80 percent of the assessed households in the 159 villages.

Adequate understanding and application of geomorphological and hydrogeological parameters is important in addressing the food and water security concerns to mitigate the

[4] http://ghi.ifpri.org/countries/IND.

[5] https://data.unicef.org/country/ind.

[6] Calculated based on Census data 2016 for the affected states.

impact of drought. Lack of localisation in terms of planning and implementation hampers the integration of relief with mitigation and, later, the longer-term development process.

For centuries, people relied on traditional water structures like ponds, lakes, tanks and wells. For many generations, these water bodies were carefully developed, maintained and sustained through community based systems. Ironically, the states currently experiencing drought have been endowed with several such community led water harvesting systems that have now fallen into disuse due to erosion of social capital and consequent decade long neglect. A positive development is that many of these states are now investing in or planning to revive them.

The following is a summary of the main findings by sector:

Water insecurity and safety

Groundwater levels dropped seriously in all states, for example, in the 2015-16 period, from 8m to 20m in Telangana. Maharashtra also saw a similar range in drop.

- Excessive extraction of water for irrigation rendered shallow hand-pumps dysfunctional, impacting access to drinking water. Eighty to ninety percent hand-pumps dried up in Madhya Pradesh. Despite ground water law prohibiting drilling of irrigation wells within a radius of 500 m from a drinking water source, rampant drilling of bore wells was observed for irrigating the water intensive crops.
- Water markets flourished in states like Maharashtra, with people selling the available bore well water to those in need at extra premium. On an average, families purchasing drinking water had to incur an additional expenditure of Rs.1000-1500/- per month.
- In most states, women were seen spending increased time (two to six hours) and covering more miles each day accessing and fetching water. About 27 percent of the households from Maharashtra, 30 percent from Madhya Pradesh and 54 percent of those from Bihar indicated that they had to spend more than two hours to fetch water. The distance to the source, queuing and fetching time had all increased by more than six-fold in Chhattisgarh.
- Water quality was at risk in several states, with increased concentration of chemical (iron, fluoride, nitrates, etc.) impurities. Microbial contamination also possibly increased. In Chhattisgarh, iron concentration in the water was found to be very high in the district of Bastar, whereas Koriya was facing problems with fluoride and Rajnandgaon with arsenic and fluoride. There was no mechanism of water quality monitoring and surveillance.
- The quality of water supplied by tankers was never found monitored at source, transportation or point of delivery level. It was perceived to be suboptimal, with many households resorting to private purified water supplies, as seen in Maharashtra.
- Open defecation had increased by almost 60-100 percent, even in Open Defecation Free (ODF) declared villages. First-time toilet users who had benefitted from the Swachh Bharat Mission[7], were seen resorting to open defecation, due to unavailability of water. Insufficiency of water for cleaning of toilets had further driven the 'first-generation' toilet users (in Maharashtra, Rajasthan, and Telangana) back to open defecation. Given that it took years to convince the rural populations to use toilets, the breach in the newly-developed practice would be seemingly difficult to bridge in months to come.

- Women from most of the households reported discontinued personal hygiene practices (despite awareness), due to scarcity of water.
- Previous practices of discriminatory distribution of water had continued across all the villages, depriving the socially backward sections of the community that normally lived on the outskirts of the village, with the tankers operating in and servicing mainly the dominant village areas. Conflicts over water distribution and related casualties[8] increased.
- While nearly half of the households assessed in Maharashtra and Telangana reported the water quality to be good, about 85 percent in Odisha complained that it was bad, while 88 percent in Jharkhand indicated that it was good. There was no water quality monitoring and surveillance system in place.
- Acute water scarcity adversely affected the functioning of public service institutions like schools, Anganwadi Centres (AWCs), Nutritional Rehabilitation Centres (NRCs), and Primary Health Centres with repeated disruption of various utilities like labour room functioning.

Food insecurity

- India's Public Distribution System (PDS) became the only source for staple food grains in all surveyed states (except Jharkhand) for about 85 percent of households. Under the National Food Security Act (NFSA) of 2013, the priority households (those below poverty line) are entitled to receive food grains of 5 kg per person per month at the issue prices of ₹ 3, ₹ 2 and ₹ 1 kg for rice, wheat and coarse grains respectively. The existing Antyodaya Anna Yojana (AAY)[9] households, however, will continue to receive 35 kg of food grains per household per month.
- Farming has become a non-viable option for small and marginal farmers. Crop losses have escalated from 10 percent to near 100 percent in some districts.
- The share of food crops within the agriculture sector came down to 58 percent in some states from 2014-2016. Water intensive commodity crops were substituted for equally water intensive cash crops (for example, cotton, maize, sugarcane, and soya-bean), contributing to water scarcity for subsistence farming.
- Nearly 60 percent of the families had to forego pulses and vegetables in their regular meals as they became unaffordable.
- In the absence of adequate food, households had to satiate hunger by consuming water-rice-salt (*pakhala* in Odisha or *paej* in Chhattisgarh).
- In Bihar, only 17.6 percent of the households were food secure. The number of food insecure households was very high (82.4 percent), out of which, around 32.4 percent were moderately food insecure and 30 percent were severely food insecure. Around 44.6 percent households were consuming only two meals in a day.

[7] A Government of India sponsored scheme to eradicate open defecation by the end of 2019.

[8] Fourteen cases of accidental deaths of children were recorded in Beed, Marathwada, related to water collection.

[9] A Government of India sponsored scheme to provide highly subsidised food to millions of the poorest families. Once a family has been recognized as eligible for the AAY, they are to be given a unique "Antyodaya Ration Card." This card acts as a form of identification, proving that the bearer is authorized to receive the level of rations the card describes. The colour of the card is green.

- In Rajasthan, around 55 percent of the households were food insecure, of which 17.5 percent were moderately food insecure, while 16.7 percent were severely food insecure. Fifty percent of the households were consuming only two meals per day.
- In Telangana, around 40 percent households were food insecure, of which 18.5 percent were moderately food insecure. Severely food insecure households were 7.5 percent and around 15 percent of the households were consuming only two meals per day.

Nutritional insecurity

Information presented here mainly refers to the nutritional assessment carried out in conjunction with the drought impact assessments in the states of Bihar, Chhattisgarh, Rajasthan and Telangana.

- Severely malnourished children cases were found in almost all the states. Moreover, Rajasthan and Telangana reported the highest incidences of malnourishment. However, this cannot be fully attributed to drought.
- Prevalence of Global Acute Malnutrition (GAM) in Chhattisgarh and Bihar has exceeded the critical stage. Prevalence of stunting in children age 6-59 months was found to be very high in Bihar, Chhattisgarh, Rajasthan, and Telangana. Prevalence of underweight children in Bihar, Chhattisgarh, Rajasthan, and Telangana exceeded the cut-off limit of 30 percent.
- As stated in the World Health Organisation (WHO) classification, level of Global Acute Malnutrition (GAM) exceeding 15 percent threshold is considered "critical'" like an emergency[10]. The results of the survey indicated that global acute malnutrition in all four surveyed states exceeded this benchmark. GAM in Chhattisgarh and Telangana was around 25 percent and 21 percent respectively. Alarmingly, GAM in Bihar and Rajasthan was more than 30 percent; more than double that the set cut-off.
- Prevalence of Severe Acute Malnutrition (SAM) in all the four states surveyed (Bihar, Chhattisgarh, Rajasthan and Telangana) was 5.2 percent during the months of June and July.
- In the surveyed population (Bihar, Chhattisgarh, Rajasthan and Telangana), 44.1 percent children were found stunted. This data, when compared with WHO cut-off, indicates 'very high' prevalence. Severe stunting was seen in 16.1 percent children in the same age group.
- The proportion of acutely malnourished pregnant women was higher than the WHO prevalence cut-off values in Bihar, Chhattisgarh, Rajasthan, and Telangana.
- The situation of maternal nutrition in the surveyed population was very similar to their children. Stunting rates among non-pregnant women were around 15 percent in Chhattisgarh, Bihar and Telangana. On the other hand, in Rajasthan only 3.5 percent women were stunted.
- Wasted non-pregnant mothers were around 57.6 percent in Bihar, 55 percent in Rajasthan, 40.9 percent in Chhattisgarh and 35.3 percent in Telangana. Severely wasted mothers (with MUAC <210mm) were highest in Rajasthan (19.7 percent), followed by Bihar (17.4 percent), Telangana (11.5 percent) and Chhattisgarh (8.7 percent).

[10] http://www.who.int/nutrition/nlis_interpretation_guide.pdf

- In Madhya Pradesh, 44 undernourished children and 26 severely malnourished children were observed from the 16 villages assessed. In Chhattisgarh, out of 276 children assessed 115 (44.1 percent) were stunted, of whom 35 (13.71 percent) were both stunted and wasted.
- Protein consumption has gone down with the changing food basket. Absence of pulses and vegetables, coupled with deficiency of milk or meat (over the last few years), had adversely affected the protein intake of nearly all the households assessed.

Impact on health

- There was no contingency planning at health facility level – Primary Health Centres and Community Health Centres (CHCs) – to tackle the water scarcity issues in all the states visited. Water scarcity in the PHCs affected surgical processes and maternal health services, as reported in Madhya Pradesh. In Chhatrapur and Rewa districts of Madhya Pradesh, women reported that non-availability of water affected the PHC functions to such an extent that for conducting deliveries, staff asked the attendants of the patients to fetch two buckets of water on their own.
- Personal hygiene practices were largely compromised due to unavailability of water. Women and adolescent girls were mainly affected. Skin diseases and incidence of Urinary Tract Infections (UTI) were common during this period as menstrual hygiene management suffered.
- Water washed diseases (skin diseases, like scabies) were reported as an obvious fallout of scarcity of water, particularly within the marginalized communities that have been customarily discriminated against in access to water.
- The education of teenage mothers was closely linked to the level of awareness regarding child rearing practices. It was found that teenage mothers with low education also had very low level of awareness on child rearing and these mothers were found to be adversely affected due to drought.
- Medical staff lacked knowledge and capacities to absorb the psychosocial impact triggered by the drought crisis.
- Health staff availability was an issue. Health institutions visited in Chhattisgarh and Telangana saw paramedics administering to the cases.
- Regarding neonatal or maternal morbidities, there was not much change seen during the summer months across the states where the assessment was carried out. However, maternal malnutrition was cited as a main problem by the District Heath Medical Officer (DHMO) in Mahabubnagar, Telangana.

Livelihood insecurity

- Subsistence farming, which supported nearly 67 percent of assessed small and marginal households, was severely affected due to successive years of drought. Availability of employment from agriculture has substantially reduced in the range of 41 percent in Odisha to 99 percent in Telangana.
- Forest drought led to reduced timber and non-timber forest produce availability in Chhattisgarh and Odisha, as well as limited fodder for cattle. The cattle population in the assessment villages in Madhya Pradesh reportedly reduced to almost half due to lack of fodder. Distress sale of livestock was reported in all the states visited.

- Inefficient and unfair pricing mechanisms as well as lack of market linkages for agricultural produce have added to the woes of small and marginal farmers, as was evident in Bihar and Jharkhand.
- Despite an increase of 50 days of assured wages (from 100 to 150), Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) was not performing well in most of the states (Jharkhand, Maharashtra, Telangana, Rajasthan, etc.) due to lack of approved job cards, demands, and inordinately delayed wages.
- Distress migration was reported from across all the states. In Maharashtra, landless and marginal farmers from Beed district continued their seasonal journeys to sugarcane-rich Western Maharashtra as sugarcane cutting labourers, while Chhattisgarh and Odisha continued providing labour for brick kilns.
- Adolescents, entire families and marginal farmers are depicting a new demographic pattern within migrants. Their "stay-away-period" has increased from 3-6 months. Nearly 80 percent of households in Telangana and 92 percent of those interviewed in Odisha confirmed that migration patterns had changed in terms of seasonality and demography.
- Lack of source and destination monitoring of migration in most states (except Maharashtra) is disadvantageous in terms of planning appropriate response measures.

Impact on education

- School dropout cases have marginally increased and absenteeism has been reported as adolescents migrate with their families. However, loss of school days due to increased seasonal migration could not be worked out as the schools do not have a system to capture seasonal absenteeism.
- Attendance at schools was reduced as children were required to spend time in supporting families, either in fetching water, herding cattle or tending to younger siblings and elderly in the absence of their parents. Nearly 20-25 percent absenteeism was reported to be due to children engaged in fetching water or grazing livestock.
- Several states started summer school and extended mid-day meals to support children and prevent drop out and migration. This has helped large number of children from drop out and migrating with their parents.
- Water, Sanitation and Hygiene (WASH) facilities in schools were adversely affected by water scarcity. As an example, hand-pumps in about 60-80 percent schools within the villages visited in Madhya Pradesh had dried up.

Protection risks

- Young children and elderly were left behind in villages, while there was increased migration of working adults. This was particularly reported in the states of Maharashtra and Odisha. Cases of child trafficking were reported from Odisha, particularly from the villages where parents had migrated leaving the children behind.
- Child labour increased, as adolescent children were supplementing family income. Deprived families often saw children as productive assets and sometimes children were forced to head the families as earning member. Several such cases were reported from Maharashtra, Telangana and Odisha.
- Cases of trafficking were recorded in Odisha. Cases of child marriages increased in Maharashtra and Telangana, but were not entirely attributable to drought.

- Child Protection Services (state or community based) were almost non-existent in most villages. Neither children nor adults were seen to be aware of child rights and child protection concerns.

GOVERNANCE: GOOD PRACTICES

Drought mitigation requires long term policy action and course correction on the unsustainable decisions from the past in the agriculture sector and by other water users, and institutions that manage ecosystems like forest, wetlands, rivers, etc. The assessment revealed that its impact can be significantly reduced in short term by a governance system that anticipates the challenge and takes timely planned and organized action to manage the consequences. The central and state governments have initiated several proactive measures, both short and long term. Some of the effective practices are listed below:

The Ministry of Water Resources launched a nationwide campaign named 'Jal Kranti Abhiyan' (Water Movement Initiative) in 2015 wherein a village with acute water scarcity from each of the 672 districts selected as 'Jal Gram'. The initiative aims at turning one water scarce village in each district of the country into water surplus village through a holistic and integrated approach by adopting conservation techniques. Activities proposed under this campaign include rain water harvesting, recycling of waste water, micro irrigation for using water efficiently and mass awareness program. Along with it, a cadre of local water professionals (Jal Mitra) was created and they will be given training to create mass awareness.

Disaster Risk Reduction Roadmap is being implemented in Bihar on the lines of Sendai Framework with technical support from UNICEF. The state has adopted drought Standard Operating Procedures (SOPs), along with progressive indicators for early detection of drought. A long-term vision document (Seven Resolves) published, envisaging 'clean drinking water and toilets in every home.

The government of Chhattisgarh mobilized additional resources for drought relief by pooling funds from Compensatory Afforestation Management and Planning Authority (CAMPA), Mining Department and Corporate Social Responsibility (CSR) for the construction or restoration of water harvesting structures. Jharkhand has drafted State Water Policy prioritizing ecology and drinking water needs. It emphasizes water conservation through Watershed Management in 80 percent of the State area which is drought prone. A convergent Pradhan Mantri Krishi Vikas Yojana (National Agriculture Development Scheme) is implemented in Madhya Pradesh with a vision of extending irrigation coverage to small farmers (*Har khet ko pani*) with improved irrigation efficiency (more crop per drop).

Maharashtra prepared an early scarcity plan wherein every surface water source was monitored, tapped and managed for drinking water supply during drought (despite the absence of district contingency plan). UNICEF in Maharashtra worked with the Ground Water Survey and Development Agency (GSDA) to develop a Drought Prediction Toolkit, to forecast outcomes such as cropping and irrigation intensities based on annual rainfall and summer water levels, enabling planning of mitigation work.

In Orissa *Pani Panchayat (an act to provide for farmers' participation in the management of irrigation system)* has emerged as an effective mode of community based surface and ground water management. Roles have been assigned to community and Panchayat Raj Institutions (PRI) for developing drought management plans.

Rajasthan has launched a program named '*Mukhyamantri Jal Swavalamban Abhiyan*' with the objective of conserving and harvesting rain water to make villages self-reliant even during drought periods bringing in convergence of different water conservation projects – rainfall, run off, groundwater and soil moisture to ensure water self-sufficiency of villages. 3000 drought affected villages are selected on a priority basis.

Telangana has launched a longer-term initiative for ensuring water security named '*Mission Bhagiratha*' (Telangana Water Grid scheme to provide safe drinking water to every household in the rural areas) aimed at development of water grid, linking ponds and reservoirs and '*Mission Kakatiya*' for the restoration of all the tanks and lakes in the state of Telangana.

Employment generation

- The number of days under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) increased in all states that faced drought. Yet MGNREGS remains a significant mechanism to deliver drought relief and simultaneously reduce the drought risk through mitigation works. As part of MGNREGS local ponds called 'Dobhas' in Jharkhand and 'Debris' in Chhattisgarh were excavated and contributed to retain water.[11]

Convergence/participation

- NGOs and Community Based Organisations (CBOs) continued doing participatory watershed development activities in Maharashtra, Telangana and Rajasthan.
- Local NGOs were included in district level committees for monitoring drought stress in some of the districts of Bundelkhand, the drought prone region of the state of Uttar Pradesh (finding from an earlier assessment done by UNICEF and Uttar Pradesh Inter Agency Group in February 2016).

SUMMARY OF KEY RECOMMENDATIONS

As the Drought Manual (2009) emphasises, given the physical, hydro-geological and agro-climatic diversity, there cannot be a standardized strategy for drought mitigation for the whole country. The solutions, therefore, must be more localized than centrally driven, more participatory than officious, more demand responsive than supply driven, and in tune with the longer-term development process rather than isolated.

Recommendations for national government

1. Strengthen and actively promote participatory risk mitigation mechanisms to account for diversity of needs and environmental conditions in the drought response.
2. Harness traditional community-based water management practices. Various states in the country, from water rich north Bihar to water scarce Rajasthan, have a rich culture of different community based management practices that have been internalized as traditional coping mechanisms through ages. Regular maintenance and participatory development would help in rejuvenating the culture of community-led natural resource management.

[11] The MGNEGA aims at enhancing the livelihood security of people in rural areas by guaranteeing 100 days of wage employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work.

3. Strengthen good practices within the community, while non-performing or risk- and vulnerability-increasing practices and policies should be regulated to avoid maladaptation. Alignment of policies and programmes should be ensured to achieve environmental and social sustainability of all the development actions.

Overall, the Drought Governance needs to be reformed, to eliminate misalignments with:

1. State Drought Manuals and SOPs integrating empowerment of water regulatory authorities and implementation of the Ground Water Regulation Act, in states where it has not been implemented.
2. Devise a uniform decision support system to guide the decision-making processes at district level in drought declaration, relief, mitigation and overall response.
3. Adopt a comprehensive/extended drought response planning process and include drought mitigation, which would require additional time. Instead of the current period of six months' relief-oriented planning, it should enable an overlap of the subsequent monsoon season, monitoring the impact of mitigation and deploying course corrections amenable to climate change variations over a time-frame of at least 18 months.
4. Integrate early warning, preparedness, immediate relief and mitigation of drought with longer term response in the form of development planning. This could be kick-started through improved drought contingency planning at the district and state levels. The implementation of contingency plans should be centred on the capacity of the Block Development Office (BDO) to lead the range of convergent work at block level. The BDO should be made responsible for performance and quality of various drought mitigation programmes and reporting to District Magistrate.
5. Plan and implement Interventions a convergent manner under the Drought Monitoring Centre for State[12], with 'block' as a unit for knowledge transfer for understanding and addressing varying impacts of drought. Drought monitoring should lead to predictable (as per standards/benchmarks and commitment listed in the proposed drought SOP) action (timely and adequate).
6. Identify and promote drought risk management solutions available at community level in terms of capacities, local and indigenous knowledge (that is, early warning signals) for drought preparedness and mitigation. Promote sharing these solutions between communities under the leadership of BDOs and District Magistrates.
7. Integrate Ridge to Valley (Surface) participatory watershed development with clear performance targets for regaining lost capacity of aquifer (Subsurface) and other elements under the broader objective of regenerative planning and designing. States may like to enact an integrated policy on regenerative planning and designing to advance achievement of the Sustainable Development Goals.
8. Explore leveraging of public funding, additional to Public Private Partnerships, Corporate Social Responsibility Funding, and MPLAD (Member of Parliament Local Area Development) fund, for raising additional revenues, collective ownership and derive co-benefits from routine development action to advance resilience approaches through disaster risk reduction/ climate change adaptation.
9. Carry out rigorous real-time monitoring and surveillance of surge support interventions, including income generation (demand creation and timely[13] wage

[12] For good practice on Drought Monitoring Centre, Government of Karnataka's practice can be referred to.

payment in MGNREGS, timely food distribution (PDS), water safety (chlorination, ODF), and security planning with specific focus on health facilities, schools and *anganwadis*, etc., in a participatory manner in coordination with local NGOs and affected communities. Innovative ideas and state-of-the-art technologies should be deployed in ensuring participatory data collection and analysis.

10. Facilitate partnership building and reinforcing with different stakeholders that deal with drought, both between government and NGOs and CBOs and within the different line-ministries of the government that deal with conservation, sourcing, extraction, distribution, and harvesting of water.
11. Conduct institutional WASH needs assessments of schools, *anganwadi* centres, PHCs, Nutrition Rehabilitation Centres (NRCs), etc., and integrated systems be built to deliver WASH services consistently and in a resilient manner. This would help in understanding the status of service-delivery benchmarks and the lacunae in terms of their rigorous implementation.
12. Ensure with all parties that women and adolescent girls are included in WASH planning in drought prone areas, as women and girls have specific needs that should be considered and they have the right to participate in decision-making.
13. Further improve the efficiency of social protection mechanisms (safety nets) to advance adaptive and absorptive capacities of at-risk households. Make community-based Child Protection Committees (CPCs) under Integrated Child Protection Scheme (ICPS) responsible for including additional points in their regular reporting, like children's engagement in water collection and status of water safety and security in schools, *anganwadis* and local health facilities. Social safety nets (various Government of India schemes) can link humanitarian and development action to achieve risk reduction and climate change adaptation outcomes.

Recommendations for state governments

Regulation and knowledge management

1. Include drought management as part of the functions of State and District Natural Calamity Committees.
2. Appropriate technology should be promoted and capacities built at the community level for participatory monitoring of ground water table levels (at the community level) and use of this data for practices like water budgeting, water security planning, etc.
3. Strengthen state and district level architecture for enforcement of Ground Water Act.
4. Formulate disaster Response standards for different sectors at the state level and adopted/promoted for implementation through District Disaster Management Authority (DDMA).

[13] The Supreme Court of India issued a reminder about MGNREGS norms for making payments within 15 days of completion of the job and compensation for delayed payments.

Planning

1. Gram Panchayat Development Plan (GPDP)[14] should promote:
   - Contextualized crop diversification,
   - Plan sustainable farm and non- farm activities,
   - Identification, notification and protection of common property resources,
   - Rejuvenation of local water harvesting systems, forest, grazing land, etc.,
   - Construction of water storage and sanitation systems in schools, anganwadis and health facilities.
2. Include water requirement for livestock (also small ruminants) and public institutions in drought response planning (tanker water supply).
3. Strengthen supply chain system of emergency medicine and immunization.

Coordination

1. Ensure involvement of (accredited) NGOs and CBOs in coordinated drought responses through their inclusion in mechanisms like District Drought Monitoring Committees.
2. Coordinate implementation of the State Action Plan for Climate Change (SAPCC) and the State Disaster Management plans, with role clarity between different departments.
3. Formulation of resilience building road maps, like Bihar DRR road map 2015-30, that plan to harness capacity of range of actors for resilience building is recommended as a state level Disaster Risk Reduction (DRR) platform activity.
4. Appoint a dedicated coordinator at the district level to support the District Magistrate in managing the coordination of drought response in consultation with local/district Drought Monitoring Committees. The coordinator must be supported by nodal officers at the block level for overseeing the implementation.

Monitoring

1. Monitor the implementation of SAPCC and Disaster Management plan through result and impact oriented indicators as well as purposive data collection of the progression of drought stress by District Disaster Management Centres.
2. Stringent participatory monitoring of toilet construction and usage should be undertaken to ensure standards and achievement of Swachh Bharat Mission (SBM) goals.
3. Promote introduction of Community Based Monitoring (CBM) in civil supplies (PDS), health services, nutrition and protection.
4. Establish migration monitoring and resource centres at the host and destination zones to track and control distress migration.

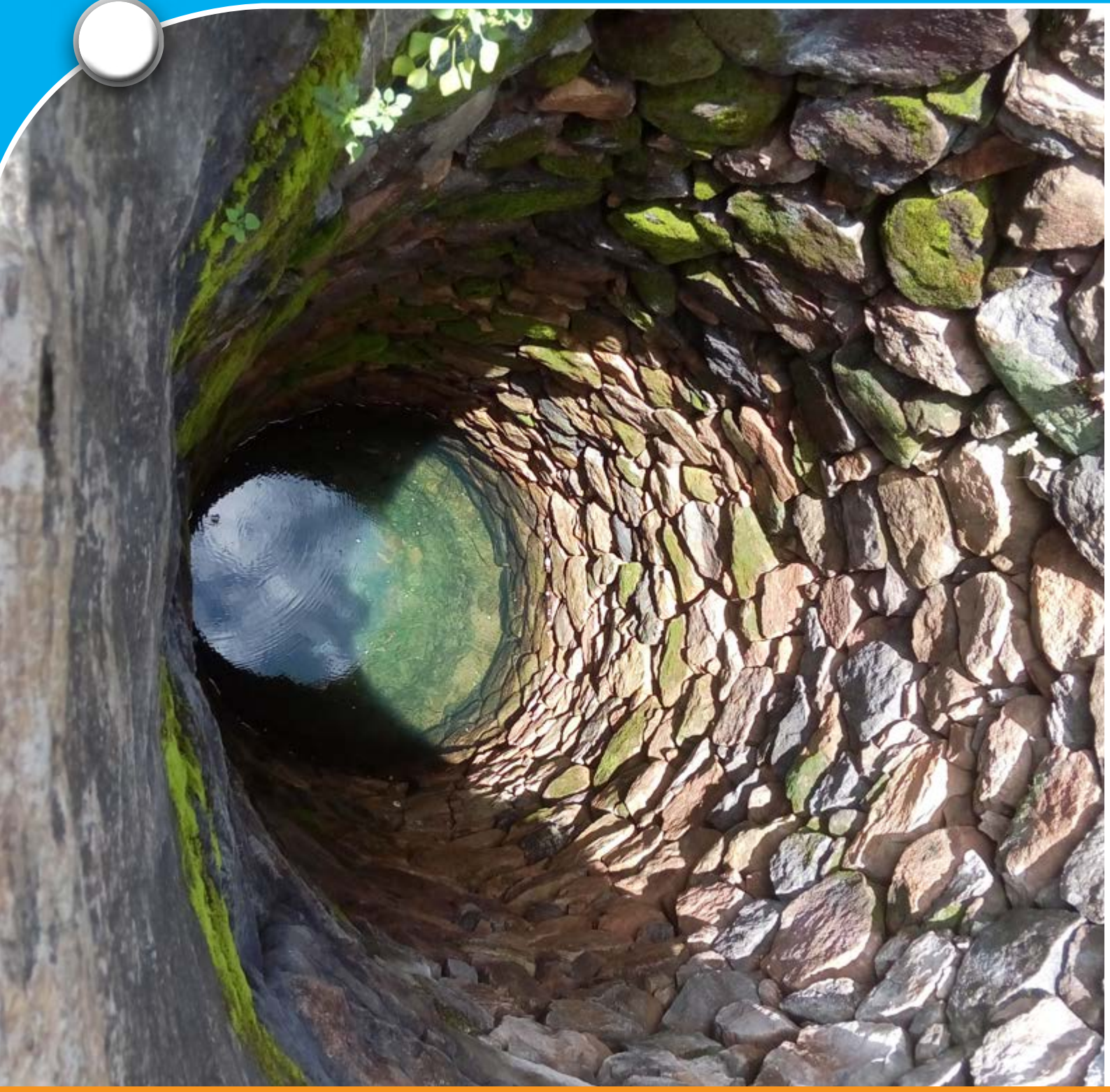
[14] Participatory Village Development Plans with funds being provided under 14th Finance Commission.

Recommendations for UNICEF and wider UN system

1. Provide policy advocacy and technical support for improved governance of natural resources to achieve objectives of environmental sustainability: For example, support knowledge management process for reinforcing the Ground Water Act and National Food Security Act. These regulations can be strengthened through collaborated action research and lessons learning to help strengthen the regulations.
2. Support line-departments to develop sector-wise SOPs for drought response (emulating the WASH SOPs developed by the Ministry of Water Supply and Sanitation).
3. Support state governments and line departments to conduct institutional WASH needs assessment in various institutions and systems, including village and block levels, to understand the status of preparedness and resilience to climate variabilities and ability to deliver services consistently.
4. Extend technical know-how/and policy advocacy support for rebuilding local knowledge regarding the importance of drought resistant crops, land use planning with focus on protection of ecosystems (ecosystem services), water management practices, low water agriculture practices, nutrition sensitive agriculture, etc.
5. Advocate and provide knowledge support for regular upkeep, maintenance and participatory re-development of traditional community based water harvesting and crop-water management practices and institutions to help prevent the culture from abandonment. Explore opportunities for its integration into Gram Panchayat Development Plan (GPDP).
6. Prioritize drought affected districts for UNICEF supported strategic and thematic interventions in coordination with the state authorities, to ensure that those that are relatively less affected don't slide down the ladder.
7. Support communities and government to prepare contingency plans that list response options for food security during drought emergencies and explain how the most vulnerable people are assisted. Advocate for national and local level food reserves during the dry season. Promote food security programmes that are inclusive and accessible by marginalized populations, and consider the different nutritional requirements of children, pregnant and lactating women, the elderly, and individuals with medical conditions.
8. Advocate for availability of adequate safe drinking water for all households and public service institutions through the installation of community level resilient water supply/distribution systems with purification facility if required. Underline that the water supply system should reduce the burden on women and girls and children in collecting water.
9. Promote food security programmes that are inclusive and accessible by marginalized populations, and consider the different nutritional requirements of children, pregnant and lactating women, the elderly, and individuals with medical conditions.

BACKGROUND OF THE 2015-16

DROUGHT IMPACT ASSESSMENT



A rapid assessment of the impact of drought and drought like conditions on women and children was carried out in June-July 2016, within 8 of the 11 affected states, with the aim of providing insights into drought management practices, and to identify UNICEF's role in supporting efforts to achieve long-term climate and disaster resilience. It is envisaged that the outcomes of this assessment would:

Be part and parcel of UNICEF India Country Office's forthcoming Country Programme Strategy seeking to address climate change.

Inform the ongoing programme context analysis and risk assessment for the programme cycle of 2018-2022.

Provide first hand evidence of the stress and its cumulative impact on children due to repeated water stress, and its connect with crop failure, climate variability, environmental degradation, etc., enabling better appreciation of long-term governance needs for drought risk-reduction.

Inform appropriate planning and programming for resilience building.

Put UNICEF in a better position to provide advice and technical guidance to government, NGOs and other partners on how to address drought and other climate related risks in a more proactive, prepared manner and help in minimizing and preventing immediate and long-term hardship for children through better resilience planning.

Further, UNICEF also decided to simultaneously launch a Nutrition and Food Security Assessment to determine the nutritional status of children aged 6 to 59 (Under 5 years) months and their mothers in the identified districts of drought affected states.

Specific objectives of the assessment

1. Assess the impact of current drought/drought like conditions due to water scarcity and its related manifestations on communities, particularly children and women, in terms of access to basic services and coping mechanisms.
2. Assess the impact of current drought/drought like conditions due to water scarcity and its related manifestation on UNICEF supported programmes, particularly the achievement of the five programme priorities.
3. Appraise drought-related governance systems at district, state and national levels to identify system strengthening needs in terms of planning, climate adaptation, preparedness, and response.
4. Provide recommendations to district administrations, state governments, and UNICEF towards their current/routine and future programming.

Additionally, the objectives of the Nutrition Assessment were:

a) To assess the nutritional status of children aged 6 to 59 months – global and severe acute malnutrition; severe and moderate chronic malnutrition; and severe and moderate underweight.

b) To assess core indicators on Infant and Young Child Feeding (IYCF) practices among 0-23 months children in the areas affected by drought.

c) To assess the nutritional status of mothers of children covered under the assessment.

d) To assess the magnitude and severity of food insecurity at the level of the household.

Scope of the assessment

Table 1: State-wise Coverage

States	Districts Covered	Villages covered under Rapid DIA	Additional villages covered under Nutrition Assessment	Total
Maharashtra	2	12	0	**12**
Bihar	4	19	17	**36**
MP	4	16	0	**16**
Chhattisgarh	3	17	13	**30**
Telangana	2	9	18	**27**
Rajasthan	2	8	17	**25**
Jharkhand	4	5	0	**5**
Odisha	2	8	0	**8**
Total	**23**	**94**	**65**	**159**

The assessment covered 159 villages in 23 districts[15] of eight states affected by drought to broadly assess:

1. People's knowledge, attitude, skills, social capital, etc., to cope and adapt to the stresses generated by climate variations like low rainfall, water scarcity, and uneven distribution of rainy days.
2. Government's knowledge, attitude, skills and organizational capacity to enhance resilience, specifically by building resilient routine service delivery systems as well as governance of drought and drought like conditions to launch exceptional response to shocks and stresses.
3. Impact on UNICEF's key thematic programming areas and priority results like:

a) Elimination of open defecation,

b) Reducing stunting,

c) Reducing neonatal mortality,

d) (Ensuring) all children in school and learning,

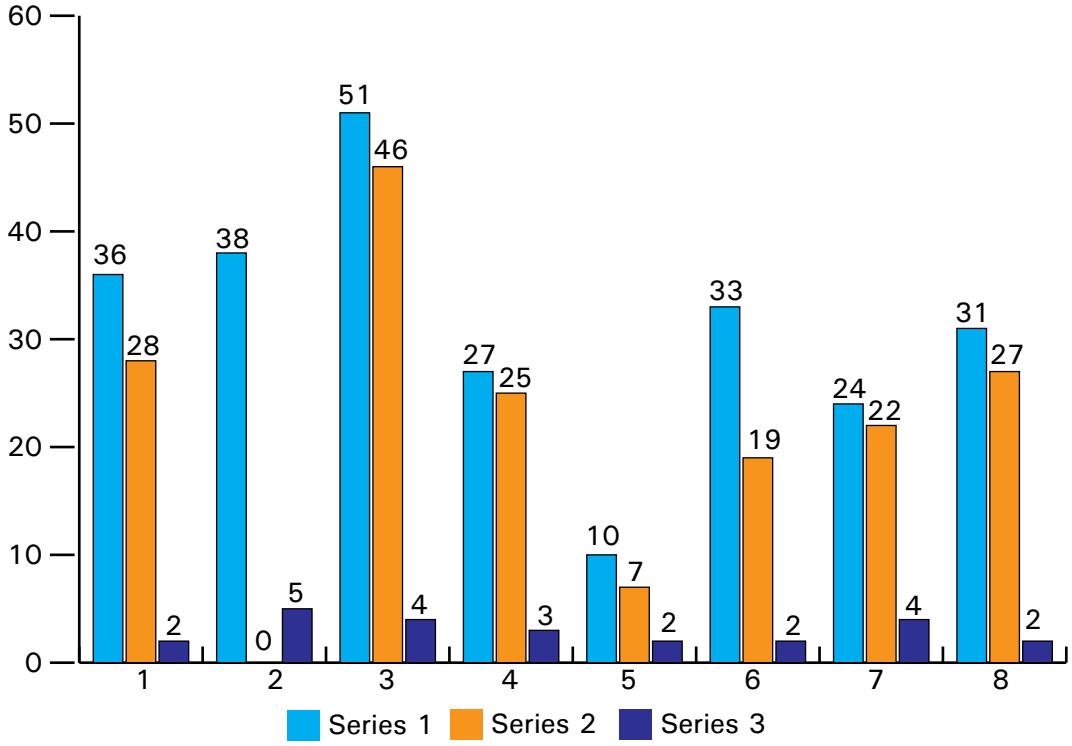
e) Protecting children from violence and exploitation.

Geographical Scope: Seven out of the eight states were declared drought affected. The situation in Bihar was unlike other states since drought had not been declared in the state in 2015. Hence, the scope of this assessment in Bihar was towards linking the drought with pre-existing conditions of development deficit and governance parameters to provide long-term recommendations rather than short-term response.

[15] Refer to Annexe 2: List of sample districts and villages. This includes the villages covered under Nutrition Assessment

Twenty-four districts were selected based on chronic drought-proneness as well as UNICEF's programme priorities. Sample blocks and villages for this rapid assessment were later identified in consultation with the respective district administrations. It was decided that the focus should be on key thematic domains like WASH, Health, Food Security, Nutrition and Livelihoods, to obtain primary and secondary information while assessing the impact that could be attributable to drought. This exercise was designed neither as a needs assessment nor as an evaluation of government or UNICEF supported programmes. It was designed as a rapid, multi-sectoral, joint assessment of impact of drought on women and children. It was primarily conducted using participatory qualitative methodologies[16]. However, wherever essential, the assessment process also followed quantitative data analysis (for example, to understand nutritional status of women and children). This included;

Figure 1: Geographical Focus



Key Informant Interviews (consultations) with multiple stakeholders, including government officials at the district level as well as Panchayat Raj Institutions (PRI) members, CBOs, NGOs, and government functionaries like *anganwadi* workers and Accredited Social Health Activists (ASHA) at the village level. Focus Group Discussions were conducted with farmers, women and children to understand the impact of drought and drought like conditions on the various aspects of life and livelihoods. Household interviews were conducted to understand the status of and impact on the coping capacities of the families and rural communities. The underlying causes of vulnerabilities and their impact on women and children over the past three to five drought years explaining the wider build-up of stress due to various factors. For specific information like the status of services and infrastructure, visual survey or transect walk was undertaken. Secondary literature review from various sources, as suggested by UNICEF, was also done for the contextual analysis of drought and drought like conditions.

[16] Nearly 740 Household Surveys, 300 Focus Group Discussions and 270 Key Informant Interviews were conducted at the village level, besides discussions and interviews with district and block authorities (excluding the Nutrition Assessment).

Desk Review: Review of long term hydrological, meteorological and human related factors/ patterns that affect drought was swiftly undertaken to carry out an analysis of drought characteristics, frequency of occurrence, severity, and management – institutional - and policy-related gaps in drought mitigation programmes. Timely availability of authenticated and updated secondary data sets was a problem in the states, further leading to difficulties in attributing the impact on women to drought and drought like conditions.

The methodology for the Nutrition and Food Security Assessment was adapted using SMART (Standardized Monitoring and Assessment of Relief and Transition) survey protocol. Being rapid in nature, it was not possible to follow complete SMART methodology and protocols for sampling.

While the Rapid Impact Assessment focused on thematic sectors like WASH, Health, Nutrition (followed up with detailed assessment), Education and Child Protection, Livelihoods and Migration patterns in the visited villages were also considered. Indigenous coping mechanisms of the local communities were assessed to understand adaptive capacities developed over the years to overcome chronic vulnerabilities as well as 'development deficits' and respond to climate variations. Efforts were made to comprehend the 'drought attributability' of observed impacts also through consultations with state and district level authorities regarding the planning and implementation of exogenous surge support organized by different government line departments to combat the scarcity.

Sampling method

Purposive Sampling Method was adopted for selection of states, districts, villages and households for this assessment. While the states were decided at the UNICEF India Country Office, the districts were finalized at the UNICEF State Offices in consultation with sector partners and other stakeholders like the government. The villages were further decided in discussion with district-level officials.

For the qualitative assessment, the teams could spend no more than a day per village. Due to time constraints, it was decided to survey at least 5-10 households, conduct 3 Focus Group Discussions (FGDs) and 3 Key Informant Interviews per village. The households were decided in consultation with the village level PRI functionaries as well as the local NGOs and authorities, ascertaining that the socio-economically underprivileged households would essentially be covered. It is acknowledged that the numbers or sample size assessed may skew the results and are not enough to extrapolate or comply with the statistical standards. However, these would help in better understanding of the differential impacts on the critically vulnerable communities who get perennially affected by drought like conditions. Criteria used for district selection in permutation and combination:

- Chronically drought prone districts (for example, Beed, Gaya, Palamau, and Mahabubnagar)
- Drought prone districts declared drought affected (for example, Shivpuri, Chhatrapur, Koriya, and Boudh).
- UNICEF focus districts (for example, Latur, Jalore, Purnea, and Rajnandgaon).

[17] Refer to Annexure 2 for details of Methodology for the Nutrition and Food Security Assessment.

[18] Those districts receive less than 750 mm rainfall annually. Thirty-three percent of country landmass is categorised as chronically drought prone. Probability of drought in chronic drought prone areas is more than 40 percent.

[19] Those districts that receive 750-1125 mm rainfall annually. Thirty-five percent of country landmass is categorised as drought prone. Probability of drought in drought prone areas is between 20-40 percent.

- State Disaster Management Authority (SDMA) suggested districts (for example, Udaipur and Sagar).
- Conflict-affected districts like Bastar and Kaimur, and tribal districts like Gajapati, Palamau, and Garhwa, were assessed, while peri-urban habitations from Patna and Ranchi were also covered.

For Nutrition Assessment[20], covering the states of Bihar, Rajasthan, Chhattisgarh and Telangana, two districts affected by drought were identified in each state; in each district 12 of the most affected villages were selected by the state and local authorities where the assessment was undertaken. In each state, the teams visited a total of 24 villages.

Process and timeline

The process kick-started with a meeting of drought and DRR professionals in Delhi on June 3, to debate and decide the methodologies. Field work started with assessment in Maharashtra on June 6 and was completed in Odisha on July 15. Preliminary findings were presented to every UNICEF state office after the end of the field work. These presentations were also made to the respective SDMAs or Relief and Revenue Secretaries of the states, as decided. The final reports were shared with the UNICEF State Offices after the agreement on recommendations and way ahead.

The participatory tools developed for collecting data, information and conducting KIIs and FGDs were contextualized before initiating the field work in each state in consultation with the stakeholder partners and UNICEF programme staff. Meetings were held with the State Revenue, Relief and Disaster Management authorities before the initiation of the field work to understand the policies and the practical perspectives of drought governance in the respective states. The process was led by UNICEF State Offices, with the DRR section acting as focal contact for facilitation of government approvals, meetings, accompaniments, secondary data collection, and overall planning of assessment at state level. UNICEF programme staff, thematic consultants, IAG partner organisations, government officials at block level, and local NGOs participated in this multi-stakeholder joint rapid assessment, along with the different thematic experts from RedR India. Eight different teams comprising more than 50 thematic experts visited eight states covering 23 districts, 54 blocks and 159 villages (including the 96 villages covered under the Nutrition Assessment), over a period of 42 days in the field.

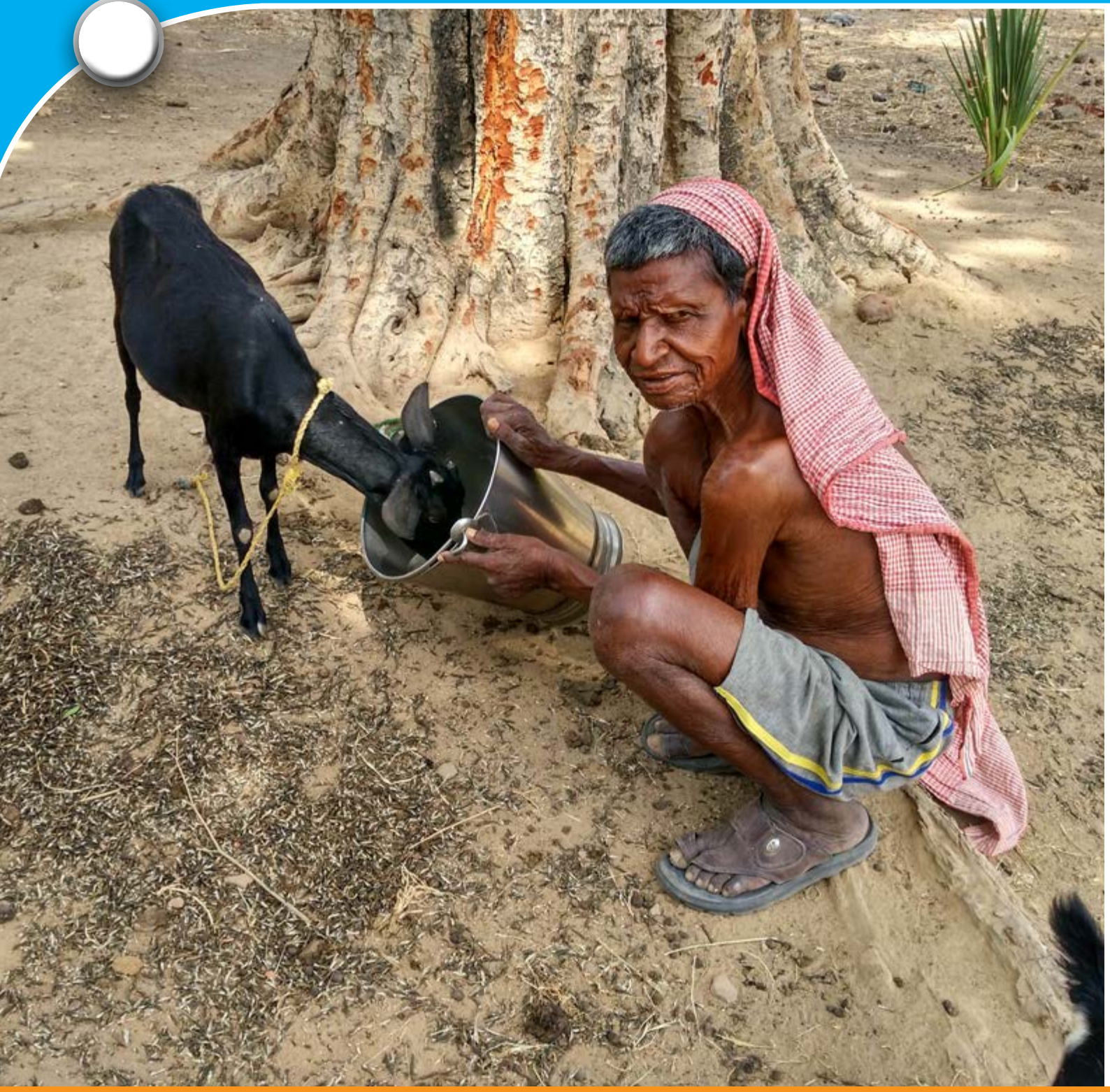
Table 2: Timeline of Assessment

States Visited	June 2016				July 2016				August 2016	
Maharashtra										
Bihar										
Madhya Pradesh										
Chhattisgarh										
Telangana										
Rajasthan										
Jharkhand										
Odisha										

[20] Refer to Annexure 2 for Methodology of Nutrition Assessment.

DROUGHT IN INDIA 2015-16

DETAILED REPORT



Introduction

Drought in India, in the purview of climate change

A broad definition of drought[21] is a deficiency of precipitation over an increased period, usually a season **or more, which results in water shortage for some activity, group or environmental sectors. According to** the India Meteorological Department (IMD), if the Indian summer monsoon rainfall (ISMR) during the four monsoon months of June to September is deficient by 10 percent (about one standard deviation) of its long-term average, it is declared as a drought monsoon. Drought is further classified as meteorological, agricultural, hydrological, and socio-economic, based on the incremental deficiencies of water and related ripple effects.

The Indian summer monsoon rainfall had three decade long alternate dry and wet epochs during the 150 years from 1840 to 1989. During the dry epoch 1960–89, there were 10 monsoon drought years (1965, 1966, 1968, 1972, 1974, 1979, 1982, 1985, 1986 and 1987). The just earlier wet epoch 1930–59 had only two drought monsoons (1941 and 1951). Such three-decade long epochs of alternating dry and wet monsoons have been observed since the 1840s, when India began to take rainfall measurements. If this natural cyclicity of period about 60 years which is found linked to the global sea surface temperature (SST) anomalies, particularly the well-known Atlantic multidecadal oscillation (AMO) continues, India may have to face yet another epoch of frequent monsoon droughts during 2020–2049[22].

Warnings on heat waves have now become part of the Disaster Management Guidance at national and state levels. Indian monsoon season (June–September) rainfall was more than 10 percent below normal in both 2014 and 2015, the first time this had occurred in two consecutive years since 1986–1987[23]. The most significant heatwaves of the period in terms of documented casualties occurred in May and June 2015 during the pre-monsoon periods in India[24]. The warmest year on record to date was 2015, during which temperatures were 0.76 °C (1.37 °F) above the 1961–1990 average. The year 2015 was also the first year in which global temperatures were more than 1 °C above the pre-industrial average. The second-warmest year was 2014, which was 0.61 °C (1.10 °F) above the 1961–1990 average, while 2013 ranks as the equal-fifth warmest year[25].

[21] Drought Risk Reduction Practices, UN ISDR, 2009

[22] Joseph P. V., G. Bindhu and G. Preethi, 'Impact of the upper tropospheric cooling trend over Central Asia on the Indian summer monsoon rainfall and the Bay of Bengal cyclone tracks', Current Science, VOL. 110, NO. 11, 10 JUNE 2016, p 2105.

[23] *The Global Climate in 2011-15 by The World Meteorological Organisation*

[24] ibid

[25] ibid

Successive warming and changes in climate has also resulted in depleted monsoon rainfall over the last five years in the country. For a region, dependent mainly on rain-fed agriculture, increased heat conditions have led to variations in rainy days, limited runoff and un-replenished groundwater tables. While some states like Rajasthan have witnessed, torrential unseasonal rainfall leading to flooding, others like Maharashtra have also faced hail storms in the month of March. The rainfall deviation, coupled with growing deforestation, is bringing doom to the unaware and unprotected rain-fed farmers, creating drought like conditions over the country for nearly three out of five years in a row.

In the last fifty years (1966-2016), India has faced 10 drought events, causing (a total of) 320 casualties, affecting 129.12 crore (1291 billion) people and causing economic losses to the tune of 234.12 crore (234 billion USD)[26]. While the economic losses are just about 5 percent of those left by the flooding events (142 in the same period), the total number of affected people is three times highest.

Historically, droughts have been a recurrent phenomenon in India. However, with the changing climatic conditions, the frequency (likelihood) and impact of drought is seen to be increasing. A study by Stanford Woods Institute of Environment in 2014 claimed that the monsoon, which provides 80 percent of the rainfall in the subcontinent, is witnessing a disturbing change. The study also found that there is substantial variability within the monsoon season, including fluctuations between periods of heavy rainfall (wet spells) and low rainfall (dry spells). "These fluctuations can cause extreme wet and dry regional conditions that adversely impact agricultural yields, water resources, infrastructure and human systems," the study[27] said.

With nearly two-thirds of the arable area being rain-dependent, a country like India, which has diverse agro-climatic conditions, crop seasons, and farming and water management practices, the impact of climate variability is longer long-lasting. Coupled with the farming population, which mostly has small holdings for subsistence agriculture with lower penetration of risk management mechanisms and products, the coping capacities fall abysmally short if the surge (additional humanitarian response) from the government fails to support and reinforce.

State governments and civil society actors are responding to this drought situation, mostly by providing relief in the form of drinking water, food grains, cash for work through Mahatma Gandhi National Rural Employee Guarantee Scheme (MGNREGS), and cattle camps as a conventional practice. However, with the continued 'corrosion' in coping mechanisms of the families, communities and entire ecosystem, the risk of erosion of development gains achieved through good work done before is always high.

Rainfall variations

Rainfall during the principal rainy season [Southwest monsoon season (June-September)] for the country for the year 2014 was below normal (88 percent of Long Period average (LPA)). Moreover, it was marked with large spatial and temporal variability. Central, peninsular and eastern or north eastern parts of the country received normal rainfall, while north western parts of the country received deficient rainfall. During 2015 the annual rainfall observed over the country was 91 percent of Long Period Average (LPA) value for the period 1951-2000.

[26] http://www.emdat.be/country_profile/index.html; Centre for Research on Epidemiology of Disasters, Belgium

[27] http://www.dailymail.co.uk/indiahome/indianews/article-2668077/Rain-pattern-changed-Researchers-warn-extreme-weather-future.html#ixzz4ltWGpmIM

The annual rainfall deficiency was mainly due to the significantly below average (86 percent of LPA) rainfall during the southwest monsoon season. Rainfall over the country during the SW monsoon season, which is the principal rainy season was significantly below normal (86 percent of LPA) which is 13th lowest ever recorded during the last 115 years (1901-2015) and third lowest during the last 15 years.

Consecutive years of rain stress have resulted in depleting ground water tables, consistent crop failures and a fall in food options, which compromises potential to achieve envisaged results for women and children, as seen in almost 80 percent of the households assessed in the 159 villages.

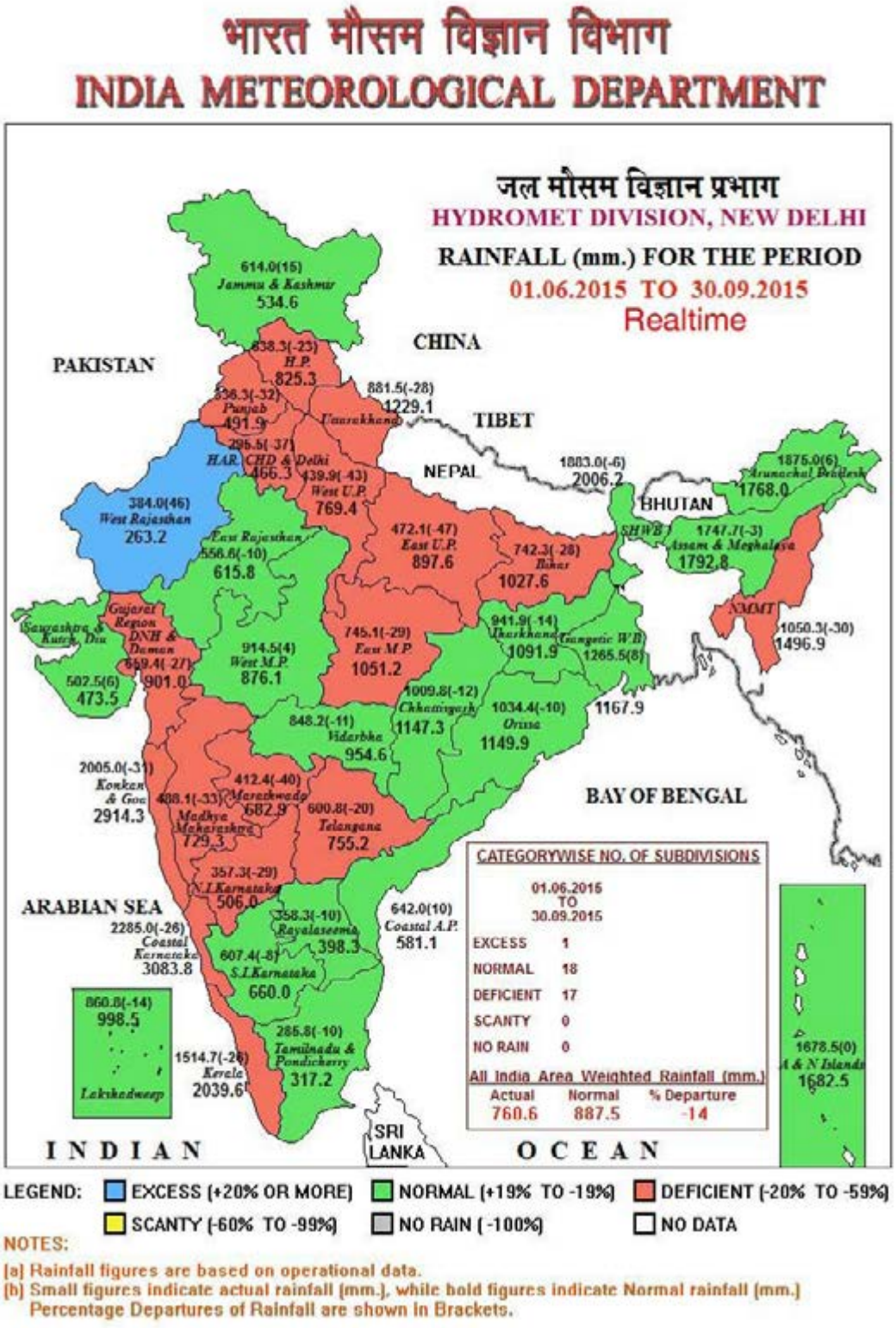
The assessment teams visited eight states that displayed a considerable variation in annual average rainfall pattern. While Rajasthan was pegged at 530 mm, Odisha had an average rainfall of 1503 mm per year. Acknowledging that the state averages would vbe anomalous, the team focused on the district rainfall data, (see Table 32 below and figure 54 on the following page) the deviation from longer term normal rainfall (LTNR) in 2015. This was ranging from 14 percent in Odisha, to 72 percent in Bihar (Kaimur).

Table 3: Real-time rainfall 2015 with percentage departures

States	Maharashtra	Bihar	Madhya Pradesh	Chhattisgarh	Telangana	Jharkhand	Odisha
Districts	Latur, Beed	Kaimur	Chhatrapur	Koriya	Medak	Palamau	Gajapati
LTNR mm	680	1126	985	1192	906	1257	1150
Deviation percent	50	72	46	55	43	42	16

As an exceptional case, the districts of Jalore and Udaipur in Rajasthan had recorded an upward deviation (excess rainfall) of 75 percent and 9.5 percent, respectively. The excessive variation, was caused by heavy precipitation in one day followed by a long dry spell. This untimely rain instead of being spread over reasonable period, resulted in crop loss in Jalore district, leading to declaration of drought. Uneven and erratic rains have thus created moisture stress, leading towards drought or drought-like conditions in many states. Consistently below average rainfall for the last three years (for example, in Latur in Maharashtra or Medak in Telangana) proved to be a 'tipping point', aggravating the drought severity[28] and impacting different segments of life and livelihoods of rural populations. The figure above shows rainfall departures for the surveyed districts for the period 2010-2014.

[28] Drought severity was assessed by different teams based on Rainfall Anomaly Index, Aridity Index and Departure Index


भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT
जल मौसम विज्ञान प्रभाग
HYDROMET DIVISION, NEW DELHI
RAINFALL (mm.) FOR THE PERIOD
01.06.2015 TO 30.09.2015
Realtime
CHINA
PAKISTAN
TIBET
NEPAL
BHUTAN
BAY OF BENGAL
ARABIAN SEA
INDIAN OCEAN
SRI LANKA
614.0(15) Jammu & Kashmir 534.6
838.3(-23) H.P. 825.3
881.5(-28) Uttarakhand 1229.1
536.3(-32) Punjab 491.9
295.5(-37) HAR. CHD & Delhi 466.3
439.9(-43) West U.P. 769.4
384.0(46) West Rajasthan 263.2
East Rajasthan 556.6(-10) 615.8
472.1(-47) East U.P. 897.6
742.3(-28) Bihar 1027.6
1883.0(-6) 2006.2
1875.0(6) Arunachal Pradesh 1768.0
SHWB
1747.7(-3) Assam & Meghalaya 1792.8
NMMT
1050.3(-30) 1496.9
Gujarat Region 659.4(-27) 901.0
Saurashtra & Kutch, Diu 502.5(6) 473.5
DNH & Daman
914.5(4) West M.P. 876.1
745.1(-29) East M.P. 1051.2
941.9(-14) Jharkhand 1091.9
Gangetic WB 1265.5(8)
1167.9
1009.8(-12) Chhattisgarh 1147.3
1034.4(-10) Orissa 1149.9
848.2(-11) Vidarbha 954.6
2005.0(-31) Konkan & Goa 2914.3
412.4(-40) Marathwada 682.9
408.1(-33) Madhya Maharashtra 729.3
600.8(-20) Telangana 755.2
357.3(-29) N.I.Karnataka 506.0
358.3(-10) Rayalaseema 398.3
642.0(10) Coastal A.P. 581.1
2285.0(-26) Coastal Karnataka 3083.8
607.4(-8) S.I.Karnataka 660.0
860.8(-14) 998.5 Lakshadweep
1514.7(-26) Kerala 2039.6
285.8(-10) Tamilnadu & Pondicherry 317.2
1678.5(0) A & N Islands 1682.5
CATEGORYWISE NO. OF SUBDIVISIONS
01.06.2015 TO 30.09.2015
EXCESS 1
NORMAL 18
DEFICIENT 17
SCANTY 0
NO RAIN 0
All India Area Weighted Rainfall (mm.)
Actual 760.6
Normal 887.5
% Departure -14
LEGEND: EXCESS (+20% OR MORE) NORMAL (+19% TO -19%) DEFICIENT (-20% TO -59%)
SCANTY (-60% TO -99%) NO RAIN (-100%) NO DATA
NOTES:
(a) Rainfall figures are based on operational data.
(b) Small figures indicate actual rainfall (mm.), while bold figures indicate Normal rainfall (mm.)
Percentage Departures of Rainfall are shown in Brackets.

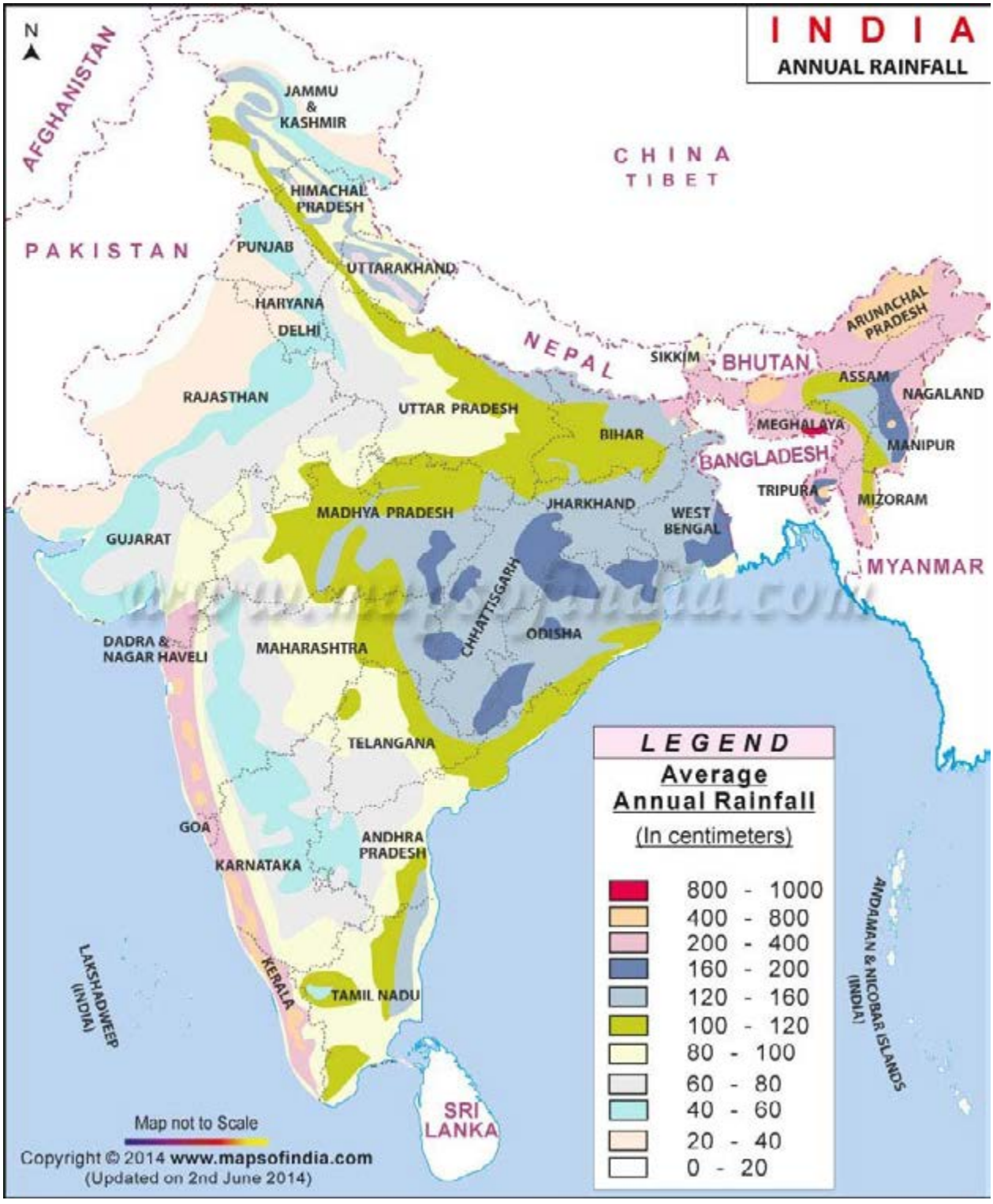


Figure 2: Annual Average Rainfall for India

Figure 3: District-wise departures of rainfall for Maharashtra (2010-14)

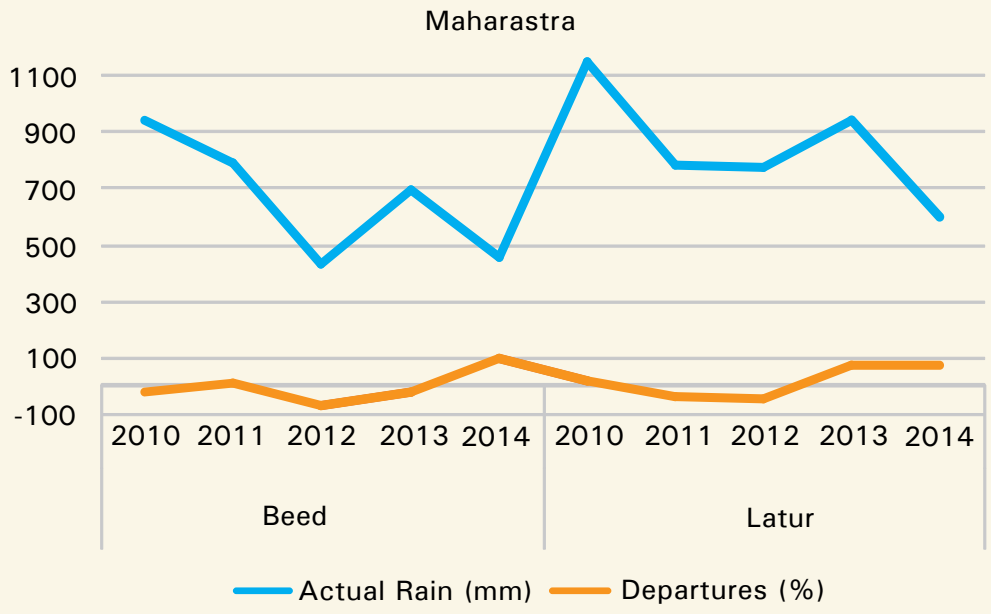


Figure 4: District-wise departures of rainfall for Bihar (2010-14)

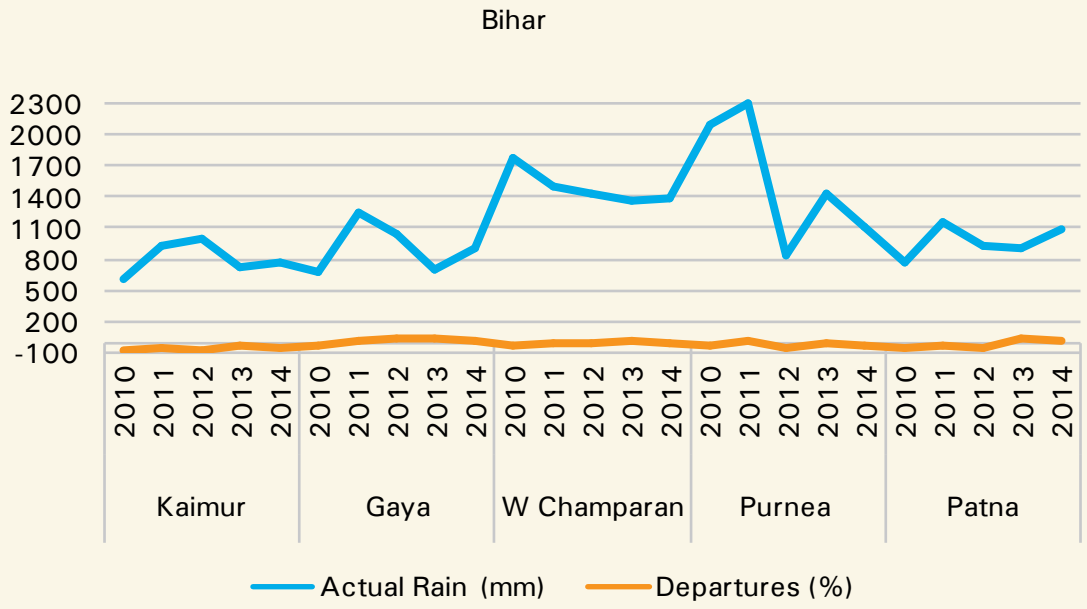


Figure 5: District-wise departures of rainfall for Madhya Pradesh (2010-14)

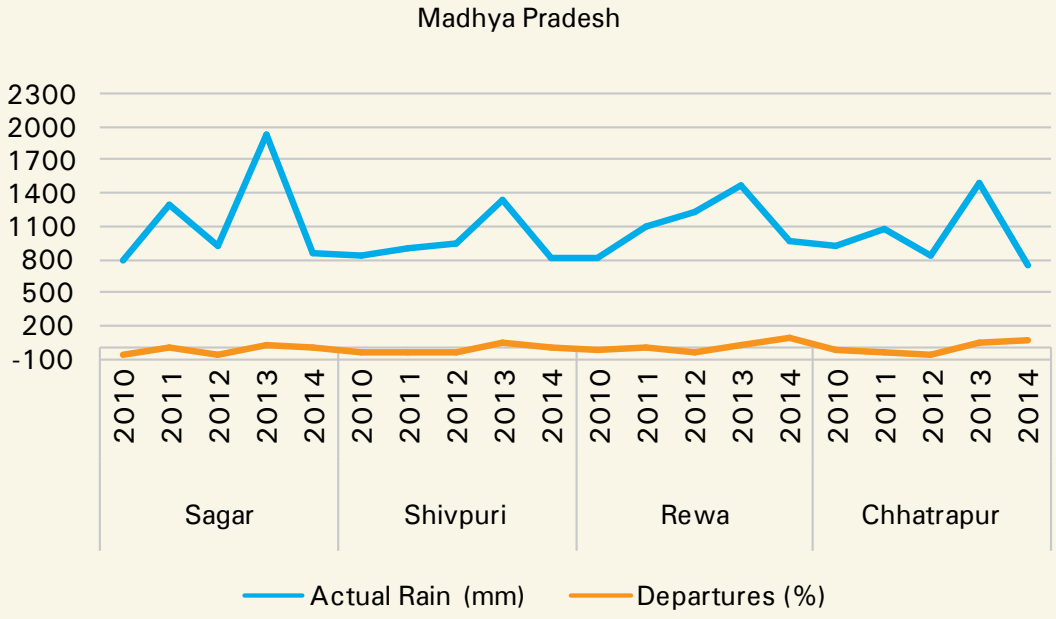


Figure 6: District-wise departures of rainfall for Chhattisgarh (2010-14)

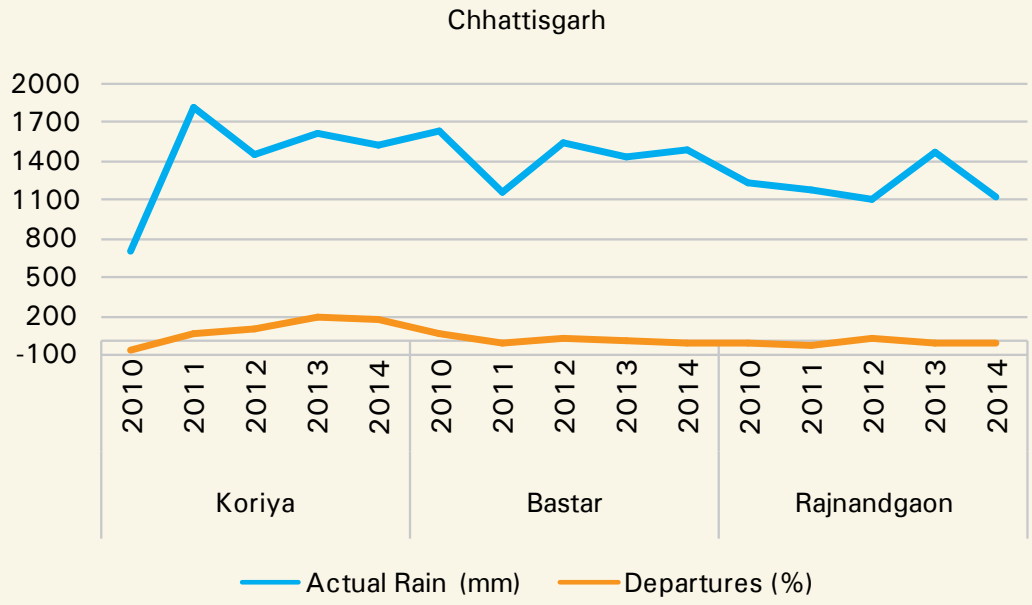


Figure 7: District-wise departures of rainfall for Telangana (2010-14)

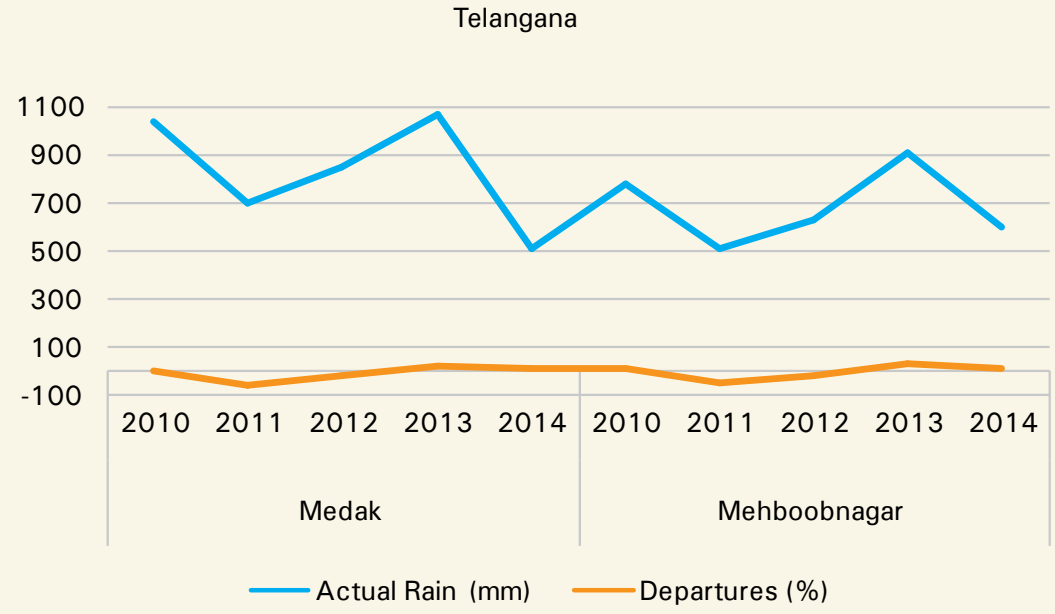


Figure 8: District-wise departures of rainfall for Rajasthan (2010-14)

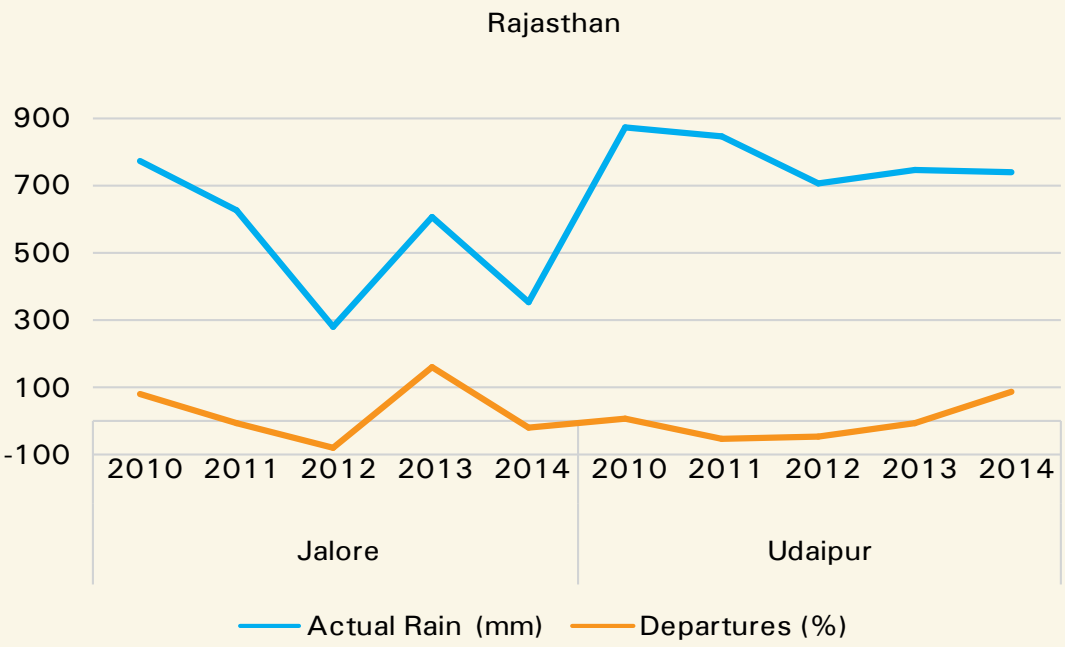


Figure 9: District-wise departures of rainfall for Jharkhand (2010-14)

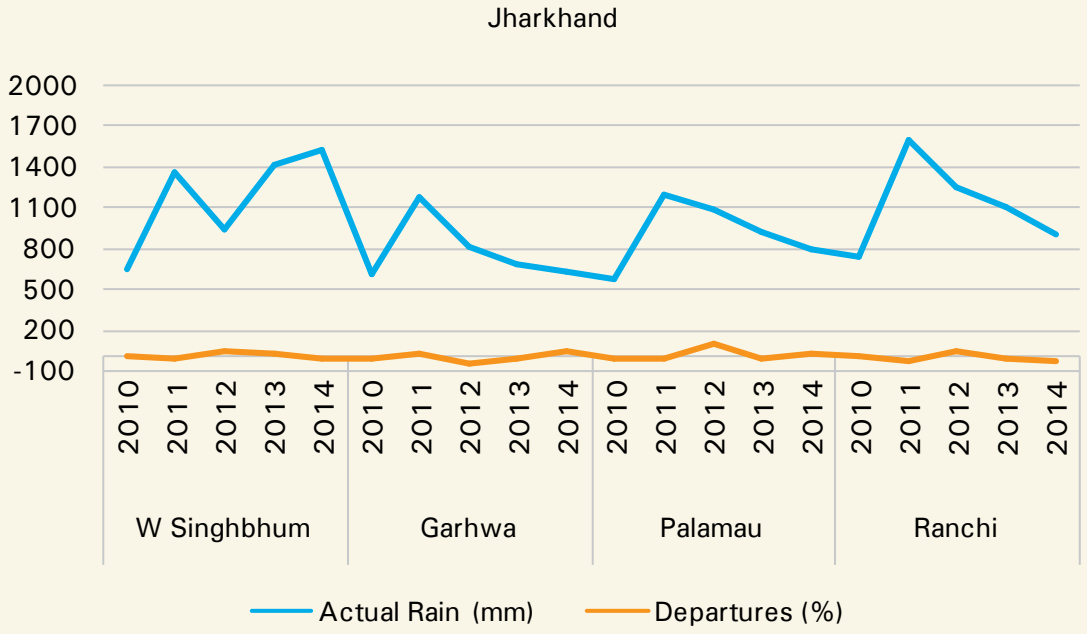
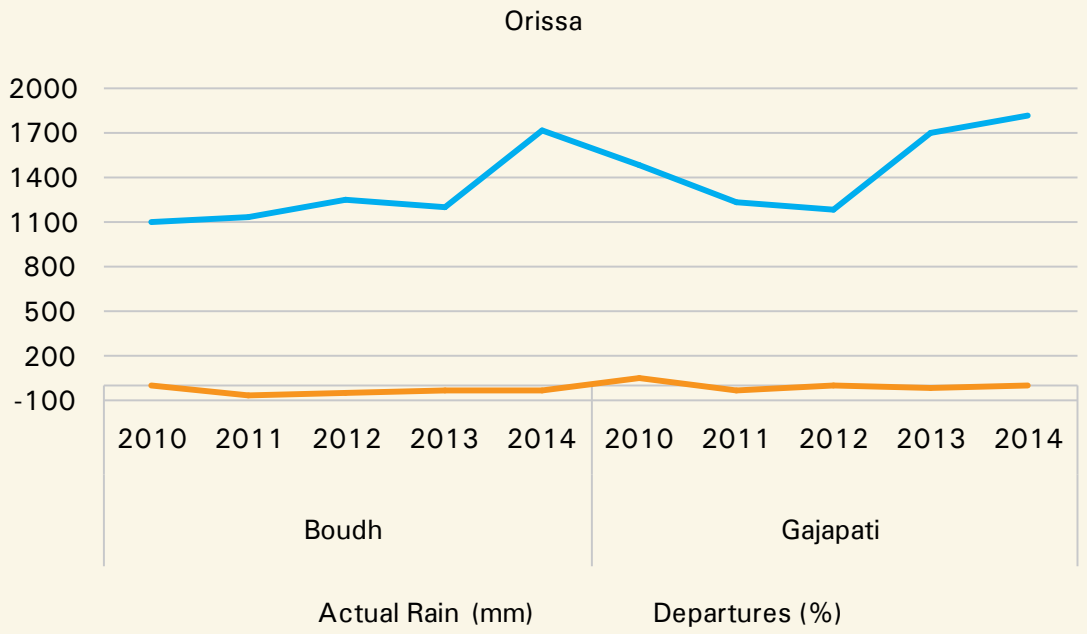


Figure 10: District-wise departures of rainfall for Odisha (2010-14)



Traditional coping mechanism

The entire Indian peninsula had a tradition of community-managed water supply and irrigation systems for ages, which helped the communities in coping with the variations in climate in a collaborative and harmonious manner. These systems were assiduously cared for and nurtured through institutionalized community-based control, coordination and management processes. However, an increase in population and upsurge in demands tend to make these localized systems inadequate.

Exogenous supply mechanisms are thereafter planned and dependence on government for provision of basic services increases. A public apathy towards upkeep and maintenance of the resource heritage, at least to serve as a contingency during their scarcity, is further contributing to the bureaucratic neglect, rendering the traditional systems obsolete.

Table 4: A Generic List of Traditional Water Management Systems in the States Visited[29]

States Visited	Traditional Water Management Systems
Maharashtra	*Bandhara* – Water retention structures across the streams/rivulets *Phad* – System of crop-water management, based on water in *Bandharas* *Bao, Vihir* – Step-wells built during Nizam period
Telangana	*Kalva* – Dykes built across rivers or streams *Tank Bunds* – Embankments for storing runoff at village level, mostly in series *Anicuts (mathris)* – Channels for diverting stored water into fields
Bihar/ Jharkhand	*Ahar-Pyne* – Ponds to retain runoff
Madhya Pradesh/ Chhattisgarh	*Bandham* – Earthen embankments with spillways (*mongha*) on black soil *Pat* – Channels for diverting head water into agriculture fields
Odisha	*Kata* – An earthen bund with a 'cut' (spillway) *Munda* – Small sized bund (layered with stones) *Bandha* – Village pond fed through seepage from *kata*, on all sides *Chahals* – Shallow channels for diversion of runoff water
Rajasthan	*Nadi* – Village pond for storing runoff *Talab* – Bigger size reservoirs in natural depressions *Sarovar* – Lakes, linking catchments with depressions through stream flows *Jhalaras* – Shallow stepped ponds, rectangular in size (intricately carved), collecting subterranean seepage *Baoris* – Shallow stepped dug wells reducing evaporation rates *Toba* – Ground depression bunded in low porosity soils *Kund, Kundi* – Covered underground tank constructed with local cementing material, used for storing rainwater for drinking purposes. Meticulous care is taken before every monsoon to clean up the catchment. Cattle grazing, entry into the catchment with footwear, is prohibited.

[29] Dying Wisdom: Rise Fall and Potential of India's Traditional Water Harvesting Systems, CSE. 1997

The traditional water harvesting structures had their inherent limitations. They were not used to cater to sudden climate variability and mostly lacked the capacity to accommodate sudden increase in demand as well as to provide buffer during scarcity. Given that sustenance of these systems depended heavily on the community-managed institutions, the government at large had little say in their management. With the omnipresence expected of governments, farmers tended to give up their interests and involvement in managing the community-based regimes. The erosion of social capital and mutual trust further meant that very few heeded the common decisions in terms of crop water management.

Challenges

Highlighting the inherent challenge of recognition of drought as a hazard that needs exceptional response, Mr. T. Nandakumar, Chairman National Dairy Development Board (IAS Retired, Chairman NDDB, Ex-Secretary Agriculture, Ex-member NDMA), states: "Within the hierarchy of hazards, drought often gets the lowest visibility and priority in the country as well as internationally. It is a poor man's disaster, a disaster of hunger, food or water insecurity and its follow-on impacts. The rich can cope with drought much better, hence it never gets the attention it deserves. In fact, it should be high on attention of Governance mechanisms of the country since it has long term impact on the development of many poor people and children in particular."

Drought is a complex, slow-onset phenomenon of ecological challenge that affects people more than any other natural hazard by causing serious economic, social and environmental losses. In 2014/15, India had a 12 percent deficit in rainfall, followed by a 14 percent shortfall in 2015-16. According to the response filed by the Ministry of Agricultural Cooperation and Farmer's Welfare, Government of India, in the Rajya Sabha (upper house in the Parliament of India) on the April 29, 2016, 266 districts across 11 states had been officially declared as 'drought affected' in 2016. Some of these districts had been experiencing repeated droughts over the past two to three years (Andhra Pradesh, Karnataka, Maharashtra and Uttar Pradesh), leading to serious food and drinking water security concerns.

Since drought is a slow-onset phenomenon, it is difficult to determine the beginning and end of a drought event. The duration ranges from months to years, the epicentre changes over time, and the impacts tend to cumulate and become widespread depending upon the local adaptive and coping capacities as well as the presence of active and good governance. Given the scale and diversity of the multiplier impacts, it becomes very difficult to generate exact financial estimates of the losses incurred due to droughts.

It is not a secret that if an average marginal farmer in a chronically drought-prone area receives authenticated information about the advancement or delay of planting or adopting a specific water-saving cultivation practice or climate 'smart' cropping system in a timely manner, the impact of climate variations could be mitigated. Not that the systems are not aware of the loopholes in addressing the slow-onset, climate induced disasters but convergence of plans, policies and practices doesn't seem to happen.

- Weather forecasts are made, but they are not necessarily accurate or timely.
- Agro-meteorological advisories are developed, but mostly in a blanket manner. It is not just the different states, but even a single district within a state has different agro-climatic zonation and therefore requires different remedial measures to tackle the climate variability.

- Communication doesn't necessarily reach the farmers in the fastest possible way, despite the advancement in technological applications.

The government responses however try to fit into an annual cycle and focus more on short-term relief. State machineries put up the responses but, given the vast geographical spread (as in 2015-16), neither the indicators nor the monitoring frameworks are defined. While some longer-term mitigation measures planned, there is a lack of 'localization' in terms of comprehensive planning, designing and implementation that hampers the integration of relief with mitigation and, later, the longer-term development process.

Provision of drinking water to the habitations is the key responsibility of state governments, with supplementary financial support from GOI. However, the drinking water programmes have been facing many a challenge in the form of source unsustainability, inappropriate water quality, unclear roles and responsibilities for operation and maintenance and, importantly, water resource regulation focusing on equitable surface and subsurface (aquifer) resource management. Many a times, aquifer management is narrowly interpreted as ground water management (regulation on abstraction), forgetting the entire connect with the process and determinants of ground water recharge. Hence, how we handle surface water, treat soil, maintain range of vegetation, etc., might be critical factors in ground water recharge with clear focus on 'Do no harm'.

Impact of drought on children

Drought declaration and response management in India have always been a large, complex political and administrative process, requiring close coordination within all governance levels. Time and time again, it is observed that affected rural communities suffer from scarcity

The Supreme Court Directs the Government of India to Formulate a National Plan on Drought Management at the Earliest and Revise the Current Drought Manual.

Swaraj Abhiyan, a non-profit, filed public interest litigation in the backdrop of drought declaration in nine states across India. The petition demanded timely compensation for farmers for crop loss and input subsidy for the next crop, restructuring of crop loans, availability of jobs under the MGNREGA, and distribution of food grains to the drought-affected people under the National Food Security Act.

Reviewing the drought manual

In its order, the apex court directed the Union Government to revise the Drought Management Manual before the end of 2016. The manual should carry weightage of all the four indicators of drought with fixed determinants. These indicators are rainfall, storage water level in reservoirs, surface water and ground water levels, and sowing and crop conditions. It also directed the states and the Centre to use technology to assess drought timely.

Though the current manual emphasizes that rain deficiency is the most important determinant of drought, state governments give greater weightage to the crop sown area out of the total cultivable area. The adverse or negative impact of a delayed declaration of drought affects the people, particularly women and children, and postpones the required assistance, it declared.

of drinking water, non-availability of fodder for cattle, migration along with families, and increased indebtedness. Each one of these situations has a negative impact on education, nutrition, care, and protection of children. Nobel Peace Laureate Kailash Satyarthi had asked Prime Minister Narendra Modi to declare the 2015-16 drought a national emergency, saying that the lives of more than 160 million children were at stake.

The supreme court on May 11 and May 13, 2016 directed the central and the state governments for better implementation of MGNREGA and National Food Security Act -NFSA (see box below) after a public interest petition was filed by Swaraj Abhiyan late last year against the backdrop of a declaration of drought in some districts or parts in nine states then –Andhra Pradesh, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Telangana and Uttar Pradesh. Moreover, the petitioner had then said drought ought to be declared in parts of Gujarat, Bihar and Haryana and essential relief and compensation be provided to the affected people.

Drought has been seen to impact the wellbeing of children in terms of their education, health and protection. While lack of adequate nutritious food and risk of water-related diseases tend to make children more vulnerable, additional responsibilities of heading households make them 'half-adults'. Education of children is awarded low priority as families migrate out of their villages in search of subsistence livelihoods. The situation of scarcity further erodes the protective environment for children.

It is alarming that almost 40 million children under the age of five, in the rural areas of the eight states visited, were facing the adverse impacts of drought. If the situation is not addressed in time, these children may lead an under-developed life in the years to come.

Drought risk reduction, not just response, hence becomes imperative.

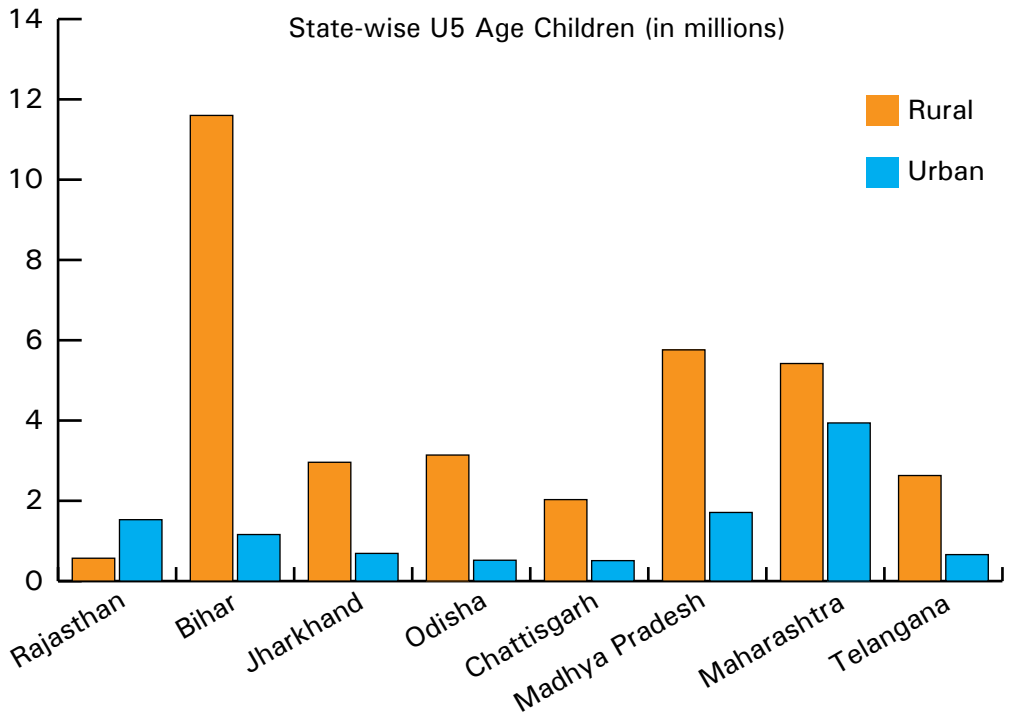


Figure 11: State-wise U5 Child Population

Impact of 2015-2016 drought on UNICEF programming

UNICEF is fully committed to working with the Government of India to ensure that each child born in this vast and complex country gets the best start in life, thrives and develops to his or her potential. UNICEF's goal is to advance the rights of children, adolescents and women to survival, growth, development, participation and protection by reducing the inequities based on caste, ethnicity, gender, poverty, region or religion. Since 2015, UNICEF India has refined its focus around five priority areas: reducing stunting, neonatal mortality and open defecation; ensuring that all children are in school, and protecting children from violence and exploitation, disaster risk reduction, behaviour change communication as well as advocacy and communication as crosscutting programme areas. Much progress has been made at the state level[30] and at the national level.

UNICEF is engaged in providing sector-specific technical advice to the Government's national health, nutrition and water and sanitation programmes, and emphasizes inter-sectoral convergence to avoid neonatal deaths, reduce stunting and open defecation. Supporting the capacity building of Government and partners to scale up improved service delivery at community and facility level for sanitation and hygiene is envisaged, especially for most deprived communities. Technical assistance to state governments is aimed at improving the Swachh Bharat Mission (SBM) implementation and effectiveness, and ensuring that children, mothers and families are using quality sanitation facilities and practicing good personal hygiene. UNICEF's assistance has led to positive outcomes in many different states. However, climate variability over the last few years, particularly the recent drought means that communities are not able to access adequate quantum of water for keeping the toilets clean or maintaining personal hygiene. This has led to an increase in open defecation, as seen in all the villages assessed. Further, lack of adequate water is also creating health risks for women and adolescent girls as they are not able to maintain appropriate personal hygiene. The drought is also seen to impact the water safety planning processes that UNICEF is supporting.

UNICEF has been working on promoting access of adolescents to not only secondary education but overall including preschool, early childhood education and on equipping girls and boys with knowledge, skills and confidence to develop healthful behaviours and protect themselves from abuse, violence and exploitation. Several states have incorporated adolescent-friendly and social inclusive norms and standards and strengthened School Management Committees (SMCs). The Ministry of Human Resources Development, Government of India, developed a Digital Gender Atlas with support from UNICEF, allowing the identification of areas in which gender disparities in education are particularly high, intersecting them with other factors like child labour and child marriages. A district level tracking tool for Integrated Child Protection Services (ICPS) was also rolled out in eight states and 15 districts to monitor ICPS progress, A finding of this assessment is that the drought conditions in many states have influenced the learning and possibly weakened the safety nets around children.

Increasingly, UNICEF India is playing a convening role as efforts towards convergent UNICEF programming with a child-centred and life-cycle approach significantly strengthen the measures to address bottlenecks affecting development of children and adolescents. With sustainable and longer term solutions being planned for reaching full immunization and Open Defecation Free (ODF) status, it becomes pertinent to ensure that the development gains made during the process do not receive a setback and get eroded due to the ripple effects of drought in the priority districts where UNICEF is working.

[30] UNICEF India Annual Report 2015

The impact of the 2015-2016 drought on communities, women and children

Summary of impacts from a macro perspective

Drought is always considered as a complex ecological phenomenon that challenges the coping capacities of the population, politicians and bureaucracy. It is an administrative challenge to manage as it requires collaboration of many state and non-state actors. The serious nature and widespread of its impact over different segments of economy, society and ecology make it difficult to understand and address its multi-dimensional impact. The communities that are used to living with risk, often reflecting protracted development deficits at times linked to manifold reasons including, mismanaged, development programmes, learned to cope using traditional community-based mechanisms and safety nets.

Drought-like conditions emanate due to a deficit in water supply, either spatially or temporally, for the standing crops, particularly in the critical period of growth and development. This becomes an additional stressor. Deficits in water supply are a result of delayed precipitation, decreased runoff, diminished ground water recharge and depleted surface and subsurface storages.

Subsistence farming, which supports nearly 67 percent of India's farmers who are also rain-dependent small and marginal landholders, gets affected severely. Significant consequences are seen not only on agricultural production but subsequently on food availability, nutrition, health, livestock systems, and allied opportunities for income generation, resulting in movement of affected populations in search of sustainable livelihoods.

This leads to disruption in education of children, with an imminent need to working after school hours in exploitative conditions or migrating for cheap labour. With lack of community-based protection mechanisms to look after the 'left-behind' children, the risks towards safety and security of children and, particularly girls, increase. Girls also tend to get withdrawn from schools to support their mothers in fetching water, doing household chores and tending to younger siblings. Caste and class discrimination denies children and women access to minimal water resources.

Drought conditions compel women to spend extra hours and trudge extra distances to fetch water. This adds to their daily strenuous routines of household chores, besides providing a helping hand at the farm or other available non-farm income generation avenues. Women in rural India wake up the first in the family to tend to daily domestic chores and sleep the last. During the droughts, they walk the farthest to fetch water but eat the least to ensure that the children and males are fed. This takes a toll on the menstrual cycle and reproductive and overall health of women during scarcity. Water scarcity compromises hygiene, especially for girls and women, as the little water available is prioritised for drinking and cooking. Continued undernourishment of women during the scarcity puts their health and wellbeing at risk.

The administrative system tends to augment the indigenous coping capacities through external support, bringing a multi-faceted, multi-stakeholder relief machine into operation. This includes the conventional delivery of tanker water supplies, food distribution and employment generation. *Anganwadi* centres and mid-day meals are initiated to prevent starvation, malnutrition and consequent vulnerability of children and pregnant women or lactating mothers to diseases. Good governance plays a vital role in effectively minimizing

risks and impacts of drought. However, lack of systems that bank on knowledge management for effective strategizing, robust architecture for enforcement of regulations, real-time monitoring, comprehensive planning and coordination of stakeholders for convergence lead towards farmers falling into debt traps and risking overall protection and welfare of women and development of children.

Figure 12: Causal analysis of insecurities and impacts of drought on women and children

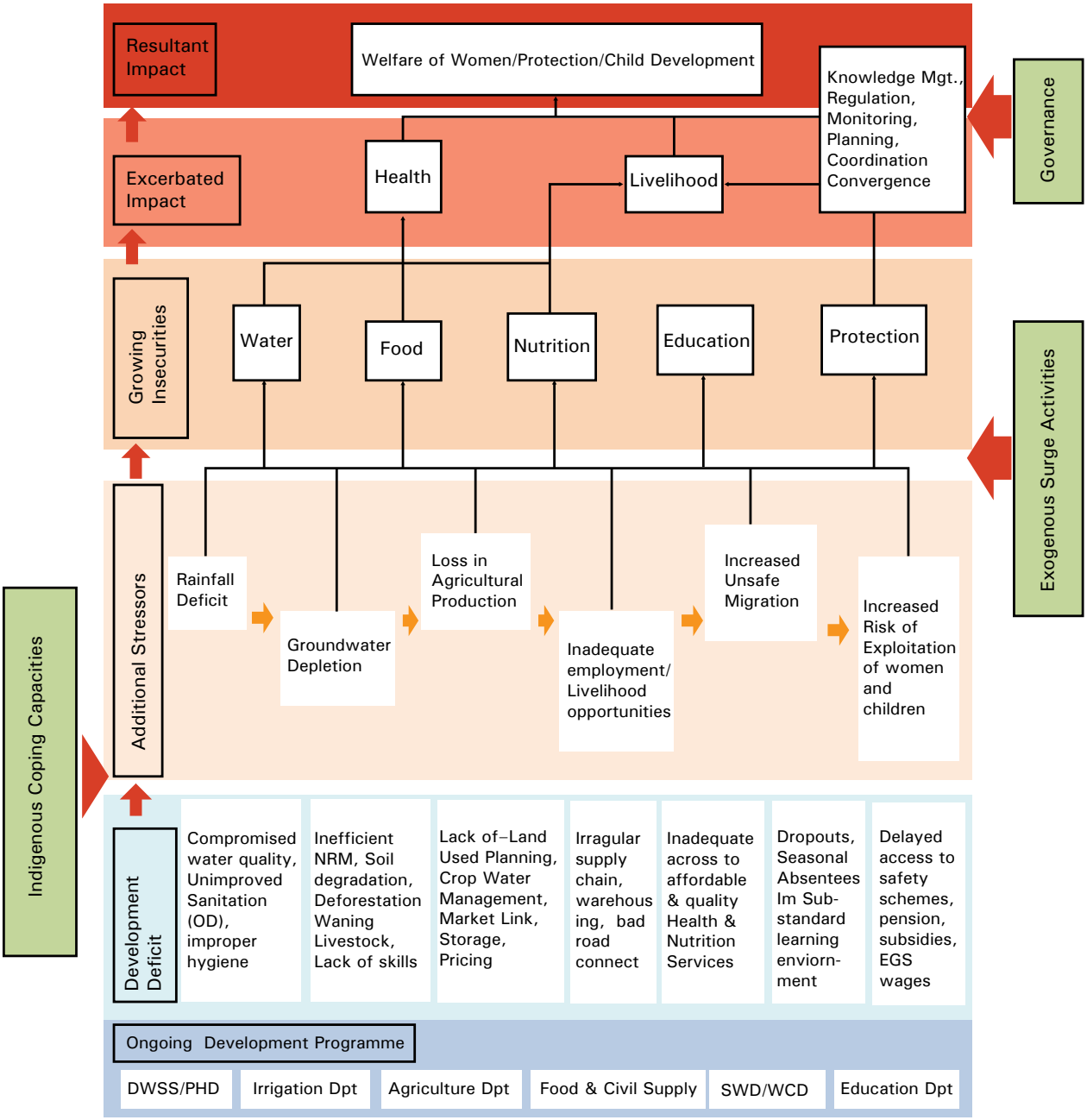
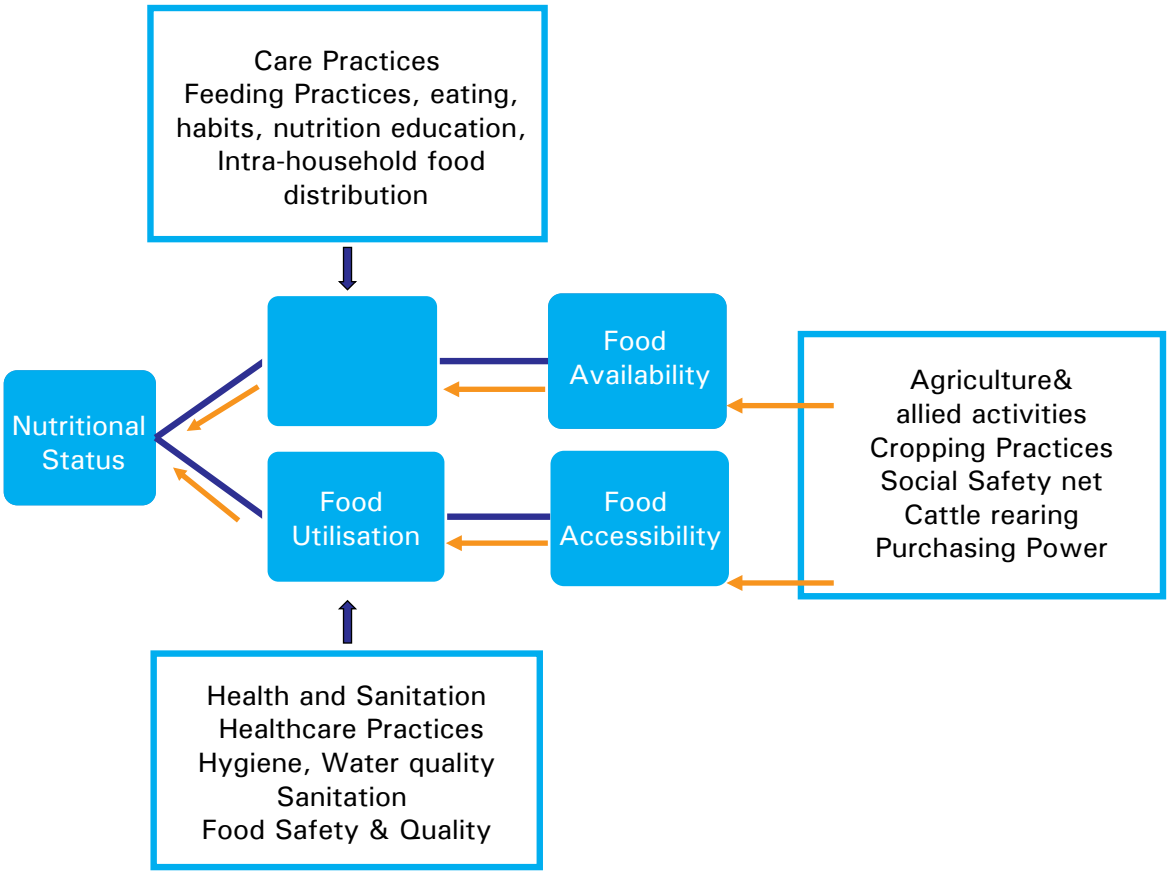


Figure 13: Factors affecting nutritional status



DROUGHT IMPACT BY SECTORS

Water, sanitation and hygiene

Situation

The Central Water Commission monitors the live water levels of 91 reservoirs across the country on a weekly basis to ascertain the storage capacities and support planning processes for irrigation, power and drinking water supplies. Some of these are in the states visited during the assessment. For the week of June 23, 2016[31], midway during the assessment process, the monitoring indicated that the proportion of overall live storage was less than the corresponding period from the last year in the country and less than the average storage of the last 10 years during the corresponding period. This finding validates the progression of drought-like conditions into confirmed hydrological drought, due to the deficiency in precipitation during the southwest monsoons over the third consecutive year.

Table 5: State-wise Proportion of Live Storage Capacities

Region	States covered	Reservoirs Monitored	Live Storage Capacity BCM	Live Storage available BCM	Proportion of Live Storage Capacity (percent)		
	States Visited				2016	2015	Last 10 years' average
Northern	Himachal Pradesh, Punjab, Rajasthan	6	18.01	4.25	24	42	30
Eastern	Jharkhand, Odisha, West Bengal, Tripura	15	18.83	3.07	16	28	17
Western	Gujarat, Maharashtra	27	27.07	2,49	09	21	21
Central	Uttar Pradesh, Uttarakand, Madhya Pradesh, Chhattisgarh	12	42.3	8.52	20	29	15
Southern	Andhra Pradesh, Telangana, Karnataka, Kerala, Tamil Nadu	31	51.59	4.88	9	23	21
Average					15	28.6	20.8

[31] CWC Reservoir Storage Bulletin, June 23, 2016

Rainfall deficiencies over successive years have resulted in reduced subsurface flows and depleted ground water levels. This is manifested in the comparison of water level fluctuation with decadal mean (November 2004 to November 2013) to November 2014, which indicates a decline of more than 4 m prominently in the states of Madhya Pradesh, Maharashtra, Rajasthan, and Telangana[32].

Status of rural water supply

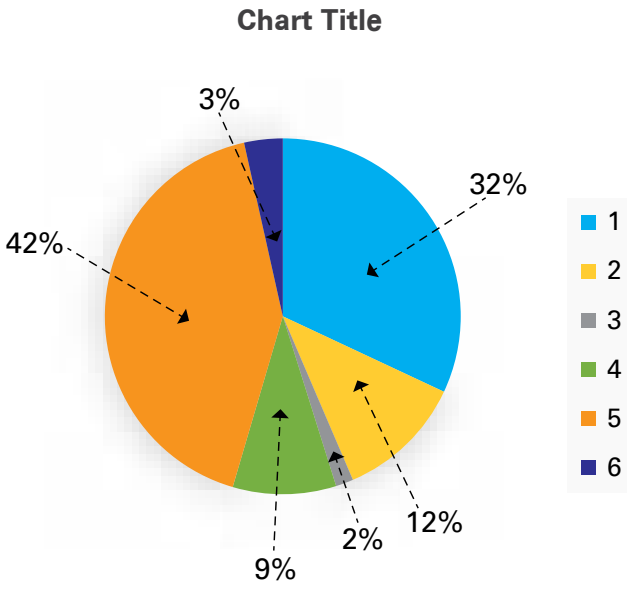
With the 73rd and 74th Amendments, drinking water and sanitation management are included in the list of subjects to be devolved to panchayats (local governing bodies). During 2012, 86.9 percent households in rural areas had access to improved source of drinking water. The Millennium Development Goals target of halving the proportion of households without access to safe drinking water had already been achieved by 2012[33].

By 2012, 32.3 percent of households in rural India had access to treated water (by any means) for drinking. While the proportion was much lower in Uttar Pradesh and Bihar, Kerala had the highest, at 90.1 percent using treated water.

Status of rural sanitation

At the launch of Swachh Bharat Mission on October 2, 2014, the sanitation coverage was 42.05 percent, which had increased to 49.29 percent by January 20, 2016[34]. Coverage implied not only access to toilets but also usage and safe disposal of excreta, since the outcome was reduction in open defecation. This entailed triggering the entire village into changing behaviour, rather than dealing individually with beneficiaries.

Figure 14: Source of Drinking Water (All India) Census 2011



[32] Ground Water Year Book 2014/15, CGWB

[33] Millennium Development Goals, India Country Report, 2015

[34] Agenda notes for SBM (G) One day review meeting with State Ministers and State Secretaries in charge of Rural Drinking Water and Sanitation, February 3, 2016, Vigyan Bhawan, New Delhi. Swachh Bharat Mission, Ministry of Drinking Water and Sanitation, Government of India

The sanitation coverage in the states of Bihar, Chhattisgarh Jharkhand, Madhya Pradesh Odisha and Telangana, was not only below the national average but also registered less improvement in coverage since the baseline. The process of verification is being captured in the online monitoring system (IMIS – Integrated Monitoring and Information System) of the Ministry of Drinking Water and Sanitation.

Assessment findings

Groundwater tables post-2015 monsoon was reportedly depleted in the range of 8m to 20m in Telangana, Madhya Pradesh and the Marathwada region of Maharashtra. Drying-up of groundwater sources (hand-pumps) in the summer months was a common phenomenon across the states, not only in the arid belt of Telangana, Maharashtra and Rajasthan but also in the hilly areas of Odisha, Jharkhand and Bihar. Surface water bodies in Chhattisgarh and Jharkhand were already dried up. It was, however, stated that the 'dry period' of groundwater sources had increased in these states due to consistent scarcity and variation in rainfall leading towards overall insecurity of water.

Cases of excessive extraction for irrigation, rendering shallow hand-pumps dysfunctional, have been observed in all the states covered under this assessment. In the villages visited in the state of Madhya Pradesh, about 80-90 percent of hand-pumps had dried up. The fact that some of the state governments provide subsidies to the farmers for diesel during the dry period, albeit to sustain the standing crop or implement an initiative like 'Million Tube wells'[35], relate to possibilities of uncontrolled extraction of water. Despite the groundwater law prohibiting the drilling of irrigation wells within a radius of 500 m from a drinking water supply source, bore wells were drilled rampantly, competing for increased depths and used for irrigating the water-intensive crops.

Case: Uncontrolled drilling of bore wells in Maharashtra

Village Ambevadgaon in Beed district has 300 bore wells in an area of just about 1000 acres. In the village Bansarola (Beed district) about 2000 bore wells have been drilled for irrigation, with a depth of 450-500 feet, most in the last three years.

Water markets had also flourished in states like Maharashtra, with people using the available bore well water as a saleable commodity and supplying it to those in need at extra premium. The rates of water ranged from Rs.15-20/pot of 12-15 litres. On an average, families purchasing water had to incur an additional expenditure of Rs.1000-1500/- per month. Doubt about the quality of tanker water supply was cited as the main reason for purchase of water from open markets.

Fetching time had increased in all the states, putting an additional burden on women. They were seen spending increased hours (two-six hours) and covering more miles each day accessing and fetching water. While 62 percent of the households among the arid Telangana region respondents took less than 30 minutes to fetch water, about 64 percent from Odisha said they had to spend about two hours to fetch water. About 27 percent of the households from Maharashtra, 30 percent from Madhya Pradesh and 54 percent from Bihar indicated that they had to spend more than two hours (up to six hours, as indicated in the Key Informant

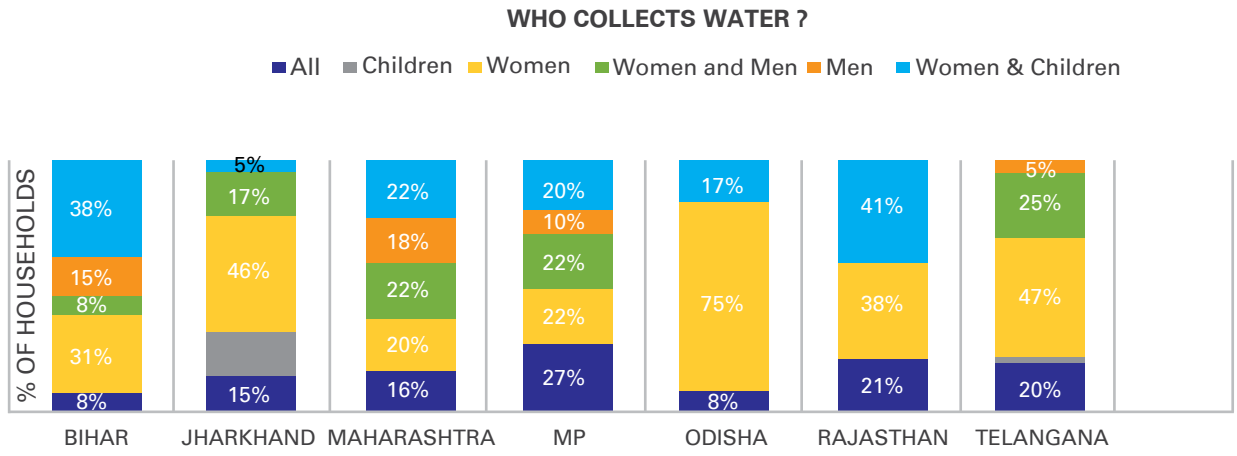
[35] Million Shallow Tubewell Programme, Government of Bihar

Interviews) fetching water. The distance to the source, and queuing and fetching time had all increased more than three to six folds. In Chhattisgarh, the fetching time had increased also because the distance to reliable water sources (to and fro) had gone up to 8 km.

More children (girls and boys) were seen assisting their mothers in fetching water. Traditionally, it was the women in the house that fetched water (20 percent in Maharashtra to 75 percent in Odisha). Amongst the households assessed, the proportion of women and children collecting water in the changed circumstances (children accompanying mothers) ranged from 5 percent in Jharkhand to 41 percent in Rajasthan. Incidentally, about 17 percent households in Jharkhand (only 2 percent in Telangana) said only children fetched water for the families. This has had an obvious impact on attendance in schools. Moreover, accessing the unsafe sources (wells without guard walls or ponds without fencing) had resulted in accidents and deaths[36] of young children who unaccompanied mothers while fetching water.

Moreover, accessing the unsafe sources (wells without guard walls or ponds without fencing) had resulted in accidents and deaths of young children who unaccompanied mothers while fetching water.

Figure 15: Primary Responsibility for Fetching Water



A practice of discriminatory distribution of water existed previously across all the villages, depriving the socially backward sections of society that normally live on the outskirts of villages. The discrimination seemed to continue even during the scarcity period, with the tankers operating in and servicing mainly the dominant village areas. Inequitable distribution made the water supply during scarcity a distant reality for those customarily discriminated against. Conflicts over water distribution were reported and related casualties increased.

Acute water scarcity adversely affected the functioning of public service institutions like schools, Public Health Centres (several stopped functioning), Anganwadi Centres (AWCs), and Nutrition Rehabilitation Centres. Most of the schools visited in the villages lacked running water systems or any sustainable alternatives for water supply. AWCs and Nutrition Rehabilitation Centres did not have a specific provision for water storage, which could be particularly used during scarcity. School teachers and Anganwadi workers from many villages therefore said they brought water to these institutions from their respective homes.

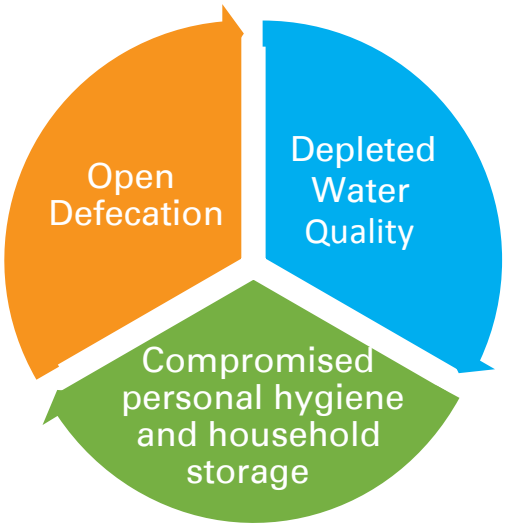
[36] 14 cases of accidental deaths of children were reported in Beed, Marathwada, related to water collection.

Most of the Public Health Centres that were dependent on groundwater sources (with water pumped into overhead tanks) faced severe water shortages not only because the sources had dried up but also because they did not have the ground storage reservoirs to allow the tankers to empty the stock during the trips. Neither did the tankers come fitted with mono-block pump sets to enable water to be lifted into the overhead tanks. The functioning of the PHCs was affected due to lack of water, forcing repeated disruptions of various functions, including labour rooms.

Water safety risks

Risks to water safety emanate primarily from unsafe water because of unimproved sanitation (proliferation of open defecation), improper quality of water at the source as well as at point of use. This is due to chemical and/or microbial contamination, inadequate household storage, and inappropriate personal hygiene practices forced by the inadequacy of water and reprioritisation of needs. With surface storage drying up fast, the humans as well as the livestock reportedly resorted to the same available sources, mainly in the tribal belts. Multiple users and utilisation, which also included the use of the same water body for washing and bathing, put the drinking water sources at risk of increased contamination.

Figure 16: Water Safety Risks



Within the villages visited in the arid belts of Rajasthan and Telangana, as well as in tribal belts of Jharkhand, Chhattisgarh and Odisha, water quality was at risk, with increased concentration of chemical (iron, fluoride, nitrates, etc.) contaminants. Fluoride was the major contaminant in Jalore, while sources in Udaipur were found to carry nitrate contamination. Sources in Telangana were contaminated more with iron and fluoride. Iron concentration in the water was found to be very high in Bastar in Chhattisgarh, whereas Koriya was facing problems with fluoride contamination and Rajnandgaon with arsenic and fluoride contamination. Lack of awareness about water quality issues was seen in the villages visited in Odisha as they had not received proper feedback from the Rural Water Supply and Sanitation (RWSS) department about the safety status of water points, forcing some to use a hand pump that was earlier marked with an 'X', symbolizing not fit for use.

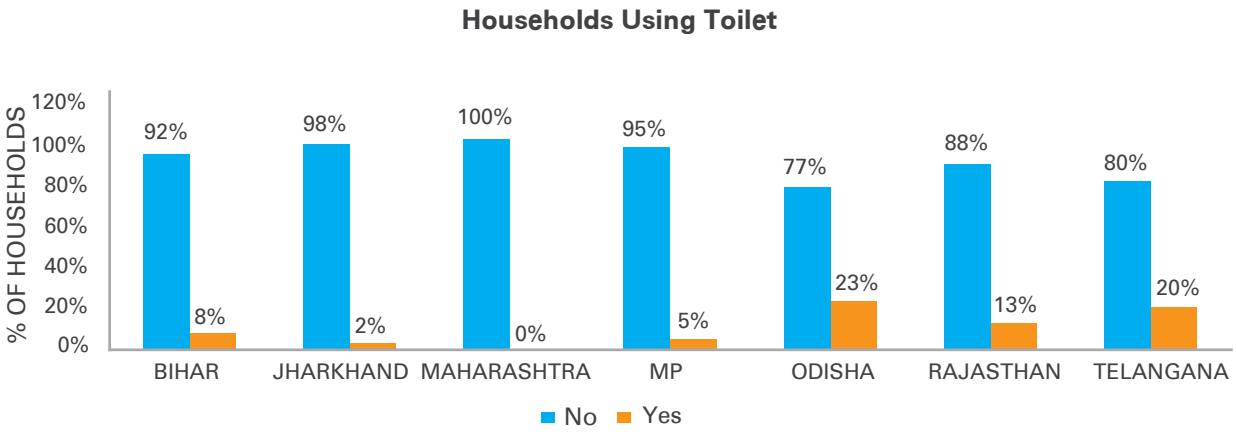
Water scarcity affecting the functioning of PHCs in Madhya Pradesh

In Chhatrapur and Rewa districts of Madhya Pradesh, women mentioned during a Focus Group Discussion (FGD) that non-availability of water affected the PHC functions to an extent that for conducting deliveries, staff asked the attendants of the patients to fetch two buckets of water on their own. This was later validated by the area ANM (Auxiliary Nurse Midwife) as well.

Lack of adequate water for maintaining personal hygiene and ablution increases the risk of secondary contamination. Women from most of the households visited spoke about discontinued or deferred personal hygiene practices (bathing, hand washing), despite awareness of related health risks, mainly due to lack of water. Absence of appropriate water quality monitoring and surveillance mechanisms during the drought period had also aggravated the risks to water quality and safety. Water quality was therefore left to perception of households. Nearly half of the households assessed in Maharashtra and Telangana found the water quality to be good, and about 85 percent in Odisha complained that it was bad, However, 88 percent in Jharkhand indicated that it was good.

Microbial contamination also possibly increased due to reported increased open defecation (77-100 percent) even in some ODF declared villages in the states. While none of the households assessed in the Marathwada region of Maharashtra reported using toilets (despite having built them – Beed was awarded as a Best District for Swachh Bharat Mission in 2015-16), toilet use was indicated by nearly 23 percent of the households in Odisha. Increased distance and fetching time for water have also resulted in according less priority to storing water for use in and upkeep of toilets, as indicated by most of the households visited. Many of these toilets were constructed newly under the Swachh Bharat Mission but are being used as storage spaces or bathing areas. Inadequacy of water for cleaning of toilets has further driven the 'first-generation' toilet users (in Maharashtra, Rajasthan, and Telangana) back to open defecation. Given that it took years to convince the rural populations to use the toilet, this breach in the newly developed practice would be seemingly difficult to bridge in the months to come.

Figure 17: State-wise percentage of households using toilets



Conclusion

Water security is paramount for ensuring water safety. Depletion of ground water and over extraction for agricultural purpose has left many shallow tube wells and hand pumps dry, resulting in a shortage of water for drinking and domestic consumption. Water scarcity is also affecting the functioning of public institutions like schools, NRCs and PHCs.

It was seen that lack of adequate water was driving people from drought-affected regions towards re-prioritizing and almost ignoring personal hygiene and environmental sanitation, despite awareness about it. Women and particularly adolescent girls were facing acute problems in maintaining menstrual hygiene. Open defecation had proliferated as scarcely available water, fetched from far off sources, was considered unusable for 'wastage' in toilets. Women and children were seen to be spending more time in fetching water, covering more distances, resulting in more drudgery for women and lesser productive time for education for children.

FOOD SECURITY

Situation

According to the Food and Agriculture Organization (FAO), food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Reduction in per capita availability of arable land over the last few years, the inability of farmers to procure credit for farm improvements to continue agricultural

practices, along with depletion of soil moisture, nutrients and fertility and overall land degradation, have collectively made farming a non-viable option for small and marginal farmers who make up 67 percent of the total landholders in India. These factors, coupled with reduction in rainfall (particularly at the crunch periods of crop growth) and depleted ground water tables create a tipping point for agricultural production and productivity.

Most of the farmers in the villages visited were small and marginal landholders who practised rain-fed agriculture and were, therefore, easy prey to climate variations. Farming communities in all the states visited indicated that agricultural practices had been impacted by the persistent drought and drought-like conditions. The soil, deprived of nutrient support and humus for long periods, had lost its moisture retention capacity. Despite some states like Rajasthan and Jharkhand receiving good early monsoon showers in (2015), the variation in monsoon was such that almost 40 percent of the rainfall was experienced in a period of two weeks. This caused more flash flooding than replenishing of the groundwater tables. It was followed by prolonged dry spells, particularly during the critical crop growth periods, leading to crop yields going down significantly.

Assessment findings

The crop losses have escalated from 10 percent to near 100 percent in some districts. This has drastically impacted the subsistence farming practised by most small and marginal landholders, with a perceived overall reduction of farm yields of about 60 percent. With limited access to credit facilities and no additional avenues of income, farmers from states like Maharashtra[37], Telangana as well as Odisha are continually falling into debt traps with private money lenders.

Many farmers chose to shift to cash crops, to create a buffer for climate variations. The tendency to grow more cash crops also stemmed from the relatively better market linkages and guaranteed minimum prices available for cash crops. Water intensive commodity crops (like cotton, maize and soybean) have thus substituted for food crops. The share of food crops came down to 58-60 percent in some states during the year 2014/15.

For example, in Marathwada (Maharashtra), on the fields that traditionally grew *jowar* (millets), *tur* and *moong* (pulses), soybean is cultivated now; some farmers have opted for sugarcane. *Jowar*, castor and groundnut, which used to be grown under rain fed conditions in Telangana, have now been replaced with cotton. Even though these crops require more

[37] Nearly 75 percent of farmer suicides in Maharashtra and Telangana have occurred in the drought-declared districts over the last two years.

water and are not necessarily compatible with local soil conditions, farmers (mostly from the arid belts) have taken to cultivating them because the returns are visible. In the process, they have been extracting excess groundwater. This trend was seen in Maharashtra, Bihar, Madhya Pradesh, Telangana, and Chhattisgarh. Scarcity of water had also affected home gardening, practised by most farming families, particularly for producing vegetables for domestic consumption.

Thus, pulses and vegetables had almost disappeared from the plates of 60 percent of the families assessed in this study over the last few years and, the food basket had changed over the last six months. Uncontrolled price rise during the scarcity period (coupled with unscrupulous hoarding) has also affected the food budget of the drought-affected families. Both *dal* and *sabji* (lentils and vegetables) have become either unavailable at the household level or unaffordable in the markets, given the reduced income generation abilities of households during the scarcity period. Meat, chicken and eggs have become a rare delicacy, mostly reserved for guests.

While only 18 percent of the households indicated food shortages in the first half of 2016, the proportion of food insecure households was about 55 percent in Jharkhand to 76 percent in Maharashtra and 85 percent in Bihar.

Food intake of families decreased considerably across the states. While there was no change in the food basket of 92 percent households surveyed in Rajasthan, nearly 88 percent households in Maharashtra and all 100 percent households in Odisha reported change in the food basket. Some women reported skipping their meals while others spoke about the reduced frequency – they now have two instead of three meals a day to cope with the situation. Moreover, the quantity of food available during these meals has also gone down – women from landless labour families in Marathwada who used to consume three bhakaris earlier now must settle for two. Most households in the rice consuming belt of Odisha, Chhattisgarh, Bihar, Jharkhand confessed to having a stock of rice enough for only a week. Moreover, the households from this region spoke of children consuming only water rice (*pakhala* in Odisha) and salt or rice and chutney or mere starch water (*paej* in Chhattisgarh) for their meals. In the absence of adequate food at home, they drank it in-between the meals or as a meal to satiate their hunger. Tribal populations depended upon the green leafy vegetables, tubers and wild fruits from the forests to supplement their meals. However, the forest drought had reduced the availability and intake of forest foods.

Given the reduction in milk production in states like Maharashtra, Rajasthan, Madhya Pradesh, and Telangana, the consumption of milk, particularly amongst the young children, had completely stopped.

Table 6: Key Findings on Household Food Insecurity

	BIHAR	CHHATTISGARH	RAJASTHAN	TELANGANA
Food secure households	17.6% (23)	53.4% (70)	45.0% (54)	59.7% (71)
Moderately food insecure households	32.4% (42)	15.2% (20)	17.5% (21)	18.5% (22)
Severely food insecure households	30.0% (39)	7.6% (10)	16.7% (20)	7.5% (9)
Households consuming two meals in a day	44.6% (58)	55.7% (73)	50.0% (60)	15.1% (18)

Household food insecurity is the key underlying cause of child stunting. In Chhattisgarh, it was found that 53.4 percent out of 70 sample households were food secure. The remaining (46.6 percent) households were food insecure, of which 15.2 percent were moderately insecure and 7.6 percent were severely food insecure. It was also reported that 3 percent of the households consumed only one meal a day, while around 55.7 percent consumed two meals per day.

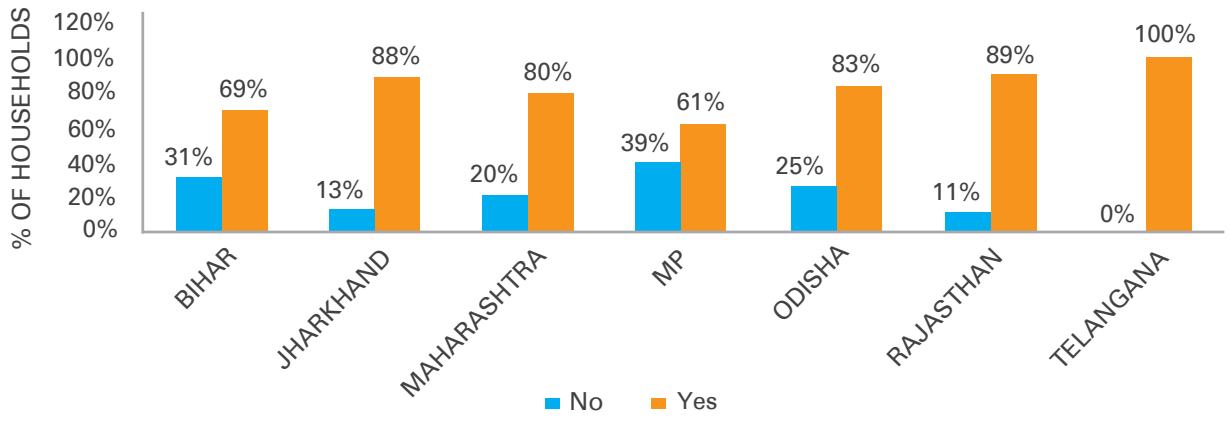
In Bihar, 17.6 percent of the households were food secure. The food insecure households were very high (82.4 percent), with around 32.4 percent moderately food insecure and 30 percent severely food insecure households. Around 44.6 percent households consumed two meals in a day.

In Rajasthan, around 45 percent of the households were food secure. The food insecure households were 55 percent, of which 17.5 percent were moderately insecure and 16.7 percent were severely food insecure. Fifty percent of the households were consuming two meals per day.

In Telangana, around 59.7 percent of the households were food secure. Around 40 percent households were food insecure, out of which 18.5 percent were moderately food insecure. Severely food insecure households were 7.5 percent, and around 15 percent of the households were consuming only two meals per day.

Increased dependency on public distribution system

Figure 18: Increased Dependence on PDS in the Past Six Months



As a mitigating measure, the state governments have introduced the *Annapurna*, *Antyodaya* and National Food Security schemes to enable vulnerable households cope with food insecurities. District administrations have been asked to ensure that the staple grains (wheat, rice) are available in the Public Distribution Shops (PDS). PDS has been the last resort for access to staple food grains in most states for about 82 percent of the households. Families from Telangana during the assessment period were fully (100 percent) dependent on PDS for their food grains and expressed satisfaction.

PDS is considered one of the most important tools for drought relief. Under the National Food Security Act, identification of families for the *Antyodaya* scheme has almost been completed. End-to-end computerization of records is being done to improve service delivery systems.

However, those from Odisha and Bihar complained about the inadequate and irregular availability of rations at the local PDS shops. Supply chain issues have continued unabated. PDS supplies reportedly meet demands only for about a week. Small families, whose PDS quota has reduced from 25 kg to 5 kg, are finding it difficult to make ends meet, as indicated in Odisha and Chhattisgarh.

States like Jharkhand have initiated nearly 583 Grain Banks to tackle emergency food shortages. Each Grain Bank has been provided with 40 quintals of food grains as well as funds for operations.

Conclusion

Most the cropped area in drought-prone regions is rain fed and dependent upon ground water as the main source for irrigation. Addressing the water insecurity planning is carried out, much in silos. Inadequate understanding of the geo morphology and hydro-geological parameters in addressing food and water security concerns exacerbates the impact of drought. Thereby, drought has become a recurrent feature of Indian agriculture. Surface irrigation and long-distance inter-basin water transfer have been touted as pragmatic solutions for addressing water scarcity. However, oversight of climate resilient crop planning and efficient water management practices based on crop-water requirements have led to water-scarce states like Maharashtra accounting for nearly 23.4 percent of the country's sugarcane production, while a water rich state like Bihar produced only 1.5 percent of the total production. (Ref. Ministry of Agriculture: "Average Share of Sugarcane Production", 2008-2011).

Food Security: Need for Institution Building

Basically, six factors need to be focused on in the short and medium term. These are: (i) infrastructure; (ii) land and water management; (iii) research and extension; (iv) inputs including credit; (v) marketing including price policy; and (vi) diversification and development of the rural non-farm sector. Institutions should be developed regarding all these aspects.

Food Security in India – Performance, Challenges and Policies. Oxfam India, 2011

Diversification of crops to tackle the water scarcity has also largely been market linked. Thus, diversion from millets has led the farmers to produce cotton and maize, which require more water and are less drought-resistant. Further, this has also led to a change in the food practices of marginal farmers, making them more and more market dependent in ensuring staple diets for their families. Minimum support price assurance for purchase of sugarcane in states like Maharashtra has resulted in nearly 67 percent of Maharashtra's water resources being diverted towards only 4 percent of irrigated land in the state (Ref. Gram Gourav Pratishthan, Pune). Unbridled extraction of groundwater (coupled with half-built and mostly ill-managed irrigation system) for sustaining cash crops have rendered the public infrastructure for drinking water dysfunctional. This has forced the service delivery systems to adopt reactive mitigation measures, leading towards tanker operations or a parallel, upgraded water supply system. As bluntly voiced by economist Nirmal Sengupta, "it could be considered as *an exaggerated emphasis on civil engineering at the cost of environmental balance, efficient crop practice and local management*"

NUTRITION

Situation

The 2015 Global Hunger Index (GHI) report ranked India at the 29th spot, with a World Bank estimating that India has the highest rate of malnutrition among children, almost double that of Sub-Saharan Africa. Adolescent girls in the rural areas could be at greater risk for nutritional stress because of early marriage and early conception before completion of their physical growth. Traditionally, the median age for marriage in rural areas is around 18 years, leaving a very short period for intervention. GOI had initiated measures to address malnutrition deficiencies amongst children, women and adolescent girls in rural areas through ICDS, iron supplementation and school based mid-day meal programmes.

As per the National Family Health Survey (4) 2015-16, a quick comparison of the nutritional status of children under five in rural India, with a focus on Bihar, Madhya Pradesh and Maharashtra, is shown in the following table.

Table 7: Children's Health and Nutrition Status

Indicators percent	Bihar			Madhya Pradesh			Maharashtra		
	Rural	Total	Total NFHS 3	Rural	Total	Total NFHS 3	Rural	Total	Total NFHS 3
U5 Stunted	49.3	48.3	55.6	43.6	42	50	38.4	34.4	46.3
U5 Wasted	20.8	20.8	27.1	27.1	25.8	35	26.1	25.6	16.5
U5 Severely Wasted	6.9	7.0	8.3	9.6	9.2	12.6	9.4	9.4	5.2
U5 underweight	44.6	43.9	55.9	45	42.8	60.0	40.0	36.0	37.0

The survey indicates that the proportion of children age 6-59 who are acutely malnourished (Global Acute Malnutrition – GAM) in all the three states mentioned above are above the WHO cut-off of >15 percent as emergency levels. The survey indicates that the proportion of children age 12-23 months receiving full immunization has increased overall from the indicators of NHFS 3, for the states of Bihar and MP, which formed part of the BIMARU[38] states. The proportion of children under five who are stunted or wasted is greater than 40 percent in Bihar and MP, which is at critical level. Similarly, the proportion of children under five who are underweight[39] is higher than the WHO cut-off values, not only for Bihar and Madhya Pradesh but also for relatively progressive state like Maharashtra. Nutritional status does not necessarily depend upon overall economic prosperity of a state, since there may possibly be some 'blind spots' that are overlooked.

[38] BIMARU is an acronym formed from the first letters of the names of the Indian states of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh. It was coined by Ashish Bose in the mid-1980s.; in Hindi, it literally means 'sick.'

[39] Based on WHO cut-off values for public health significance 1995, the prevalence of underweight >30 percent is considered as a 'very high' prevalence. http://www.who.int/nutrition/nlis_interpretation_guide.pdf.

Efforts were made to understand these blind spots, and to establish linkages of the sub-optimal nutrition status of children under five with the continued food scarcity over the last few years in the states assessed. A separate Nutrition and Food Security Assessment[40] was carried out in the states of Bihar, Chhattisgarh, Telangana, and Rajasthan during June-July 2016. Same sample villages selected for the Rapid Impact Assessment were visited during this assessment. The results are briefly enlisted in the following table.

Findings in nutrition assessment

Table 8: Key Findings on Nutritional Status of Children (6-59 months)				
	BIHAR	CHHATTISGARH	RAJASTHAN	TELANGANA
Children who are stunted	49.5 (143)	44.1 (115)	46.8 (140)	46 (120)
Children who are severely stunted	21.1 (61)	16.1 (42)	17.1 (51)	12.3 (32)
Children who are wasted by WHZ criteria	30.4 (90)	23.2 (63)	37.3 (117)	19.2 (50)
Children who are severely wasted by WHZ criteria	3.4 (10)	5.2 (14)	3.8 (12)	3.1 (8)

Table 9: Key Findings on IYCF Practices (0-23 months)				
	BIHAR	CHHATTISGARH	RAJASTHAN	TELANGANA
Children < 6 months who are breastfed within one hour of birth	45.5 (10)	74.2 (23)	17.4 (4)	40 (8)
Children < 6 months exclusively breastfed	50 (11)	67.7 (21)	43.5 (10)	75 (15)
Children aged 6-8 months receiving solid or semi-solid food	60 (9)	54.1 (13)	42.1 (8)	60 (9)
Children 6-23 months receiving breast-milk	89.5 (85)	95.6 (88)	84.4 (76)	89.4 (93)
Children age 6-23 months receiving adequate diet	18.9(18)	10.8 (10)	5.5 (5)	58.7 (61)

Infant and Young Child Feeding (IYCF) were found to be sub-optimal in the surveyed area. The practice of early initiation of breastfeeding within an hour of birth was 17.4 percent in Rajasthan, 40 percent in Telangana, 45.5 percent in Bihar, and 74.2 percent in Chhattisgarh. Exclusive breastfeeding rates among infants less than 6 months old were 67.7 percent in Chhattisgarh and 75 percent in Telangana. About half of the infants (< 6 months) received exclusive breastfeeding in Bihar, whereas in Rajasthan 43.5 percent infants received breastmilk only.

The indicator on continuation of breastfeeding among 6-23 months was encouraging. More than 80 percent of the children received breastmilk across four states. This indicator depicts the positive attitude of mothers and communities regarding breastfeeding.

[40] Refer to comprehensive Nutrition and Food Security Assessment Report, June-July 2016, for further details.

On an average, the introduction of complementary feeding was found to be delayed universally. Children 6-8 months introduced to complementary feeding were 54 percent in Chhattisgarh and 42 percent in Rajasthan. In Bihar and Telangana, the numbers were 60 percent.

The meal frequency and food group diversity of complementary feeding were abysmal in the surveyed population. Children between 6-23 months who received adequate diet were 10.8 percent in Chhattisgarh, 18.9 percent in Bihar and 5.5 percent in Rajasthan.

Table 10: Key findings on maternal nutritional status
(Number of sampled given in the bracket)

MATERNAL ANTHROPOMETERY	BIHAR	CHHATTISGARH	RAJASTHAN	TELANGANA
MATERNAL ANTHROPOMETERY – Non-Pregnant Women				
With height < 145 cm / Stunted	15.8 (30)	14.7 (27)	3.5 (7)	14.7 (23)
With MUAC < 230 mm / Wasted	57.6 (109)	40.9 (75)	55 (109)	35.3 (55)
With MUAC < 210 mm/ Severely Wasted	17.4 (33)	8.7 (16)	19.7 (39)	11.5 (18)
With BMI < 18.5 kg/m2	48.7 (92)	40.4 (74)	52.5 (104)	31.4 (49)
MATERNAL ANTHROPOMETERY – Pregnant Women				
With height < 145 cm / Stunted	22.6 (7)	14.3 (2)	6.5 (2)	19.2 (5)
With MUAC < 230 mm/ Wasted	58.0 (18)	35.7 (5)	35.5 (11)	53.8 (14)
With MUAC < 210 mm / Severely Wasted	12.9 (4)	7.1 (1)	6.5 (2)	19.2 (5)

The situation with maternal nutrition in the surveyed population was very like that of the children. Stunting rates among non-pregnant women were around 15 percent in Chhattisgarh, Bihar and Telangana. Same indicators were estimated for pregnant women in the surveyed area. It was found that around 20 percent pregnant women were stunted in Bihar and Telangana. Stunting affected 14.3 percent pregnant women in Chhattisgarh. On the other hand, in Rajasthan, only 3.5 percent women were stunted. Based on MUAC < 230mm, wasted non-pregnant mothers were high in statistics; around 57.6 percent in Bihar, 55 percent in Rajasthan, 40.9 percent in Chhattisgarh, and 35.3 percent in Telangana. Severely wasted mothers (with MUAC < 210mm) were highest in Rajasthan (19.7 percent), followed by Bihar (17.4 percent), Telangana (11.5 percent), and Chhattisgarh (8.7 percent).

Body Mass Index (BMI) was also calculated to estimate under-nutrition among non-pregnant women. In Rajasthan, more than half (52.5 percent) of the non-pregnant women were identified as under-nourished. Among the non-pregnant women, 48.7 percent were under-nourished in Bihar, followed by 40.4 percent in Chhattisgarh and 31.4 percent in Telangana.

More than half of pregnant women in Bihar (58 percent) and Telangana (53.8 percent) were identified as being wasted based on MUAC < 230 mm. In Chhattisgarh and Rajasthan, around 35 percent pregnant women were wasted. Rates of severe wasting based on MUAC < 210mm were significantly high across the four states. In Telangana, strikingly, 19.2 percent pregnant women were severely wasted, followed by 12.9 percent in Bihar, 7.1 percent in Chhattisgarh, and 6.5 percent in Rajasthan.

Conclusion

The change in the food basket over the last few years and, particularly, the absence of pulses and vegetables in meals, coupled with deficiency of milk and meat, has adversely affected the protein intake of nearly all the households assessed. The cases of undernourished and severely malnourished children found in Madhya Pradesh, Chhattisgarh, and Odisha, as well as in Bihar, Jharkhand, Rajasthan, and Telangana, are at the tipping point; however, this cannot be attributed to drought alone. However, the drought situation put additional stress on the already malnourished families, women and children. Reduction in quality, quantity and frequency of meals has particularly impacted the women, who generally eat last in the families, and the adolescent girls who are seen to be compromising. The Government of Telangana runs the *Aarogya Lakshmi* scheme, which provides one full meal each for pregnant women and lactating mothers at the *Anganwadi* Centres. However, not more than 20 percent women access these facilities, owing to other work related exigencies or social obligations. Lack of nutritious food intake in the case of pregnant women has resulted in an increase in the number of 'low birth weight' babies, as reported in states like Madhya Pradesh and Chhattisgarh. This is also indicated in the data available at the district hospitals in Marathwada. The proportion of acutely malnourished (GAM) pregnant women is higher than the WHO prevalence cut-off values in Chhattisgarh, Bihar, Rajasthan, and Telangana. The situation can thus be called 'critical'.

Child malnutrition

Acute malnutrition manifests when an individual fails to receive adequate food and/or suffers with any episode of illness. During drought or water-stress conditions, access to food suffers adversely and due to pressing water needs, communities must compromise on hygiene and sanitation; eventually they become vulnerable to debilitating diseases. Hence, drought or drought-like conditions can lead to an upsurge in acute malnutrition rates.

As per the WHO classification, a level of GAM exceeding 15 percent threshold is considered 'critical'," like an emergency[41]. The results of the survey indicated that GAM in all four surveyed states exceeded this benchmark. GAM in Chhattisgarh and Telangana was around 25 percent and 21 percent respectively. Alarmingly, GAM in Bihar and Rajasthan was more than 30 percent, more than double cut-off. Chronic malnutrition or stunting emerged as a grave public health problem across the surveyed area. As per WHO prevalence cut-off values for public health significance (1995), if the prevalence of stunting is more than 40 percent in a population then it is considered as a 'very high' prevalence. Stunting rates in all four states far exceeded the WHO cut off

[41] http://www.who.int/nutrition/nlis_interpretation_guide.pdf

Above this under-nutrition data cannot be attributed to drought alone, as rates of under-nutrition are already high in the country due to several factors like open-defecation, low knowledge regarding feeding practices, inadequate access to healthcare, sub-optimal childcare practices, and gender inequity, to name a few. But natural calamities like drought compound the misery of the vulnerable population by many folds and preclude their capacity to cope.

Infant and young child feeding practices

Lack of knowledge about complementary feeding (frequency, food-group diversity, age-appropriate feeding) and inadequate support at community level are some of the reasons why appropriate feeding practices were not followed. Though the survey was not designed to capture the reasons, the above-mentioned points came out during the interaction with the respondents. It is worth noting that, drought cannot be attributed to prevalent IYCF practices; however, it is an established fact that there is an association between IYCF and child nutrition. Drought adversely impacts household food security, consequently jeopardizing a child's nutrition and health status.

Malnutrition among women

The direct relationship between maternal nutritional status and child nutritional status has been widely documented. Under-nutrition in women of reproductive age is a significant risk factor for mortality and morbidity in both children and their mothers. Underweight status in women has been associated with poor reproductive performance, poor pregnancy outcomes and, more specifically, with intrauterine growth restriction (IUGR), low-birth weight (LBW), and increased risk of maternal deaths. The data collected during the nutrition assessment clearly shows higher prevalence of malnourished women in the tribal districts of Bastar, as compared to the rural district of Rajnandgaon.

HEALTH

Situation

Access to and awareness about overall health care, including maternity or delivery care for vulnerable pregnant women, child immunization and treatment of common childhood diseases for children under five, has been improving in India, albeit slowly. Cases of registered pregnancies in the rural areas, for which mothers receive Mother and Child Protection (MCP) cards, are now in the range of 80.3 percent in Bihar to 92.7 percent in Maharashtra. However, the proportion of lactating mothers who receive financial assistance under the *Janani Suraksha Yojana* (JSY) in rural areas for institutional deliveries is still low (for example, only 55.8 percent in rural Bihar)[42].

A closer look at rural Infant and U5 Mortality Rates (IMR & U5MR) in Maharashtra, Madhya Pradesh and Bihar indicates that both IMR and U5MR for Bihar (43/1000 and 60/1000 respectively) are double that of Maharashtra (24/100 and Madhya Pradesh 30/1000, respectively). Incidentally, as compared with Maharashtra, about 25 percent more adolescent girls in Bihar get married before the age of 18 and became pregnant before reaching 19 years of age. Despite the Prohibition of Child Marriage Act (2006), which considers child marriage as a punishable offence, nearly half the girls (48 percent) in rural areas are married off before the age of 18. Child marriages are higher in Bihar and Rajasthan, where approximately 60 percent of females aged 20-24 marry as children[43]. The conventional practices, coupled with disaster vulnerabilities, may contribute to this trend.

Disasters are seen to adversely impact the health of children and women in the short and medium term, particularly in rural areas where protracted development deficits have led to impeded access to health care results in morbidity and lack of immunization against vaccine-preventable diseases. A natural disaster in the past month increases the likelihood of diarrhoea, fever and acute respiratory illnesses by 9-18 percent. Additionally, it reduces height-for-age and weight-for-age z scores by 0.12-0.15 standard deviations, increases likelihood of stunting and underweight by 7 percent and reduces the likelihood of having full age-appropriate immunization coverage by 18 percent. [44]Given that both diarrhoea and acute respiratory illness (ARI) are already leading causes of under-five child mortality in India, exposure to droughts and subsequent lack of treatment could lead to more serious consequences.

Disasters further limit access to essential drugs and even supplies that help protect women during menstrual periods. Coupled with relative unawareness about hygienic methods of menstrual hygiene management, the supply deficit creates problems for women, leading to urinary tract infections (UTI). NFHS 4 indicates that 72.7 percent women in Bihar and 44.3 percent women in rural areas of Maharashtra do not use hygienic methods during menstrual periods.

Assessment findings

Consistently delayed and diminished rainfall over the last few years has had a cascading effect on various aspects of the lives of vulnerable populations in the states visited. With loss

[42] NFHS 4, 2015-16

[43] http://unicef.in/Whatwedo/30/Child-Marriage

[44] *The Impact of Natural Disasters on Child Health and Investments in Rural India*, Ashlesha Datar etal, May 2011

of subsistence agriculture and a steady flow of income, the food baskets have deteriorated in terms of nutritious diet. This, along with poor sanitation and risks to water safety, has further reduced immunity, mainly of women and children.

Disease prevalence

Mostly, no drought-attributable disease pattern could be identified during the rapid assessment. Routine immunization including polio dosages were administered in most of the health facilities. In Madhya Pradesh, it was seen that nearly 60 percent of the households visited had access to health facilities within 5 km of their residence. About 20 percent had to travel 5-10 km while the rest needed to travel more than 15 km.

No major outbreaks were reported during the scarcity season in most of the states. Acute diarrhoeal diseases declined (Bihar) in relation to the respiratory diseases. However, the diarrhoeal disease outbreak, which is characteristic of the monsoon season (July), was reported in Jharkhand during the summer months (May) in 2014 and 2015. Substantial increase in the number of typhoid and worm infestation cases was also recorded.

Water-washed diseases (skin infections like scabies) were reported as an obvious fallout of the scarcity of water, particularly within the families that have been customarily discriminated for access to water.

Personal hygiene practices were largely compromised due to unavailability of water, with women and adolescent girls being particularly affected. Skin diseases and urinary tract infections were common during the drought period as menstrual hygiene management suffered. Anaemia was reported amongst adolescent girls.

Water quality related diseases like (skeletal) fluorosis were seen in Rajasthan and Telangana. Most of the people visited suffered from joint pains and backaches.

Heat wave conditions were seen in Telangana, Rajasthan, Jharkhand, and Odisha, where the temperatures soared to extremes during the summer months. Preparedness measures were taken by the PHCs in the form of stocks of Oral Rehydration Solution at the village level. *Anganwadi* Workers, and women's groups were encouraged to make people aware of the preventable aspects through use of radio messaging, posters and other Information Education Communication material.

Psychological or mental stress burden, particularly on women, could not be picked up. There appeared relative lack of sensitization about the psychosocial impact of drought amongst the medical staff.

Maternal and child health

Not much change was seen in terms of maternal and neonatal morbidity during the summer months across several states. Maternal malnutrition was cited as the main problem by the District Health and Medical Officer (DHMO) of Mahabubnagar, Telangana state. Institutional deliveries were not taking place in the government health facilities in Jalore in Rajasthan and Bastar in Chhattisgarh. In Jalore this was since better facilities were available in nearby Gujarat; In Bastar, which is conflict affected, the problem was absence of medical staff in the government hospitals.

Hospital level preparedness

Good Practice
Curious Case of Maternal Health in Bihar

Surveillance of maternal mortality was perceived to be weak in Bihar due to inadequate training of ASHA and unavailability of data collection tools in the local language (Hindi). However, the antenatal care had improved, along with increase in institutional deliveries. Hospital data revealed that maternal mortality had reduced. The district administration had also provided ambulance services on call at the block level.

There was no contingency planning at the hospital (PHC, CHC) level to tackle water scarcity issues. Coupled with omissions in the planning process for tanker water supply, most of the village and block level health institutions were suffering from water scarcity. This was reported in almost all the health institutions visited across the states, in Maharashtra, Telangana, Chhattisgarh, Madhya Pradesh, and Odisha. Surgical procedures and maternal health services at sub divisional level (Madhya Pradesh) were reportedly affected due to lack of water. Referrals were then made to the district hospitals. Cleanliness (of the labour rooms) was also affected. Some of the establishments had to be closed due to water scarcity. Lack of generator sets, unavailability of groundwater storage tanks, and absence of caretakers for maintenance were some of the reasons cited, apart from the depleted groundwater tables and unyielding borewells in the hospital campuses.

Health staff non-availability was also a major issue in health institutions visited in Telangana and Chhattisgarh. Paramedics were seen administering to the cases and dispensing medicines due to absence of doctors.

Conclusion

Most deaths of children under five in India occur due to preventable diseases like pneumonia, diarrhoea, malaria, etc. Measures like immunization is crucial for preventing such deaths. However, during the drought season, particularly with migrating families, it becomes difficult to track children.

Mothers and children in the lowest wealth quintile, as well as those from the socially underprivileged (and largely discriminated) sections of society, are seen to have a proportionately higher mortality rate. Access to potable water, improved sanitation, and hygiene promotion suffers during the scarcity period, putting children and women at risk of communicable diseases.

The age of a mother at childbirth, her awareness (or education), spacing between two children, or gender discriminatory child-rearing practices, and maternal and child nutrition were important considerations for health care even during drought response.

Lack of capacity building and sensitization of health care staff, inadequate promotion of health care services, inappropriate coordination and convergence amongst WASH, hamper the adoption of universal health care that would shield the vulnerable populations during drought conditions.

LIVELIHOOD SECURITY

Situation

With two-thirds of its arable area drought-prone to varying degrees, India is easily the most vulnerable country to drought or drought-like conditions in the world. Reduction in crop production has a ripple effect on the subsectors that are dependent on the agriculture economy.

Although agriculture contributes only 14.62 percent of India's GDP, most of the Indian population depends on agriculture and allied activities for livelihood. This population is mainly engaged in crop farming, livestock rearing, and unskilled agricultural labour activities. Out of the total workforce of India, about 54.6 percent (24.6 percent as agricultural cultivators and 30 percent as agricultural labourers) were engaged in agriculture and allied activities in 2011; about 53 percent of India's gross cropped area was rain fed. This shows a heavy dependence of the agrarian economy on rainfall[45].

Depleted rainfall always has a devastating impact on agriculture and animal husbandry. Optimum coverage of area under irrigation plays an important role in effective drought mitigation. However, with reduced crop area under irrigation despite the immense work done on developing the irrigation potential (for example, Maharashtra has nearly half the country's dams but only 17 percent of the arable land in the state is irrigated so far), the marginal and small landholder farmers lose the adaptive capacities to drought. The case of landless agricultural labour is even more miserable as they face high reduction in on-farm unskilled employment within their niche. Drought not only threatens their water, food and nutrition security but also their livelihood security as they are denied access to annual income from agricultural land and access to credit facilities and subsidies. This financial hardship forces them to migrate in search of better livelihood options.

Assessment findings

Drop in subsistence farming and agricultural productivity has also impacted alternative means of livelihood. Cattle rearing has become extremely challenging in Marathwada, Telangana, Chhattisgarh, Jharkhand, and Madhya Pradesh due to increasing dearth of fodder and high maintenance cost of cattle. Farmers (from Madhya Pradesh were considering to let the livestock free rather than rearing it at home. The proportion of livestock and cattle has substantially dwindled. Distress sale of cattle has been reported in states like Madhya Pradesh, Maharashtra and Telangana. Cattle costing ₹. 80,000/- had to be sold for ₹. 20,000/-, as reported by villagers from Bansarola in Latur district, Maharashtra.

This had also impacted milk production and alternative livelihood options like dairying in states like Maharashtra and Rajasthan. Milk production in Latur in Maharashtra came down from 4, 15,000 litres/day to 1, 25,000 litres/day, subsequently bringing down the number of households dependent on dairy business.

[45] Parmeshwar D Udmale et al, *International Journal of Disaster Risk Reduction*, September 2015.

Rural populations in some states and particularly the tribal belts of Chhattisgarh, Odisha and Jharkhand depend on forest produce, apart from timber, as an alternative source of livelihood. To supplement family incomes, landless labour and marginal farmer families are seen engaged in collection of non-timber forest produce, which include *tendu* leaves, sal seeds, herbal medicinal plants, bamboo, lac, and honey. Reduction in collection of *tendu* leaves by 66 percent and mahua by 80 percent was reported in Chhattisgarh. This impacted the financial status of the vulnerable communities so much, that the District Magistrate of Bastar himself expressed concern over the hidden impact of drought on forests and how that might hamper tribal livelihoods in the state. Women in Madhya Pradesh have long since taken to bidi making; however, they are prone to health risks.

Fisheries are being promoted in Telangana as an alternative livelihood, with 100 percent subsidy on fish seedlings. Women have taken to fisheries on tanks dug on small holdings in a major way. However, as reported the Assistant Director of Fisheries in Mahabubnagar district about 90 percent of the fishery tanks have dried up, forcing the women labourers to migrate for lack of any other viable income opportunity.

MIGRATION

Migration was considered, during this rapid assessment, in terms of understanding the conventional patterns, practices and the possible impact of drought. The likelihood of and reasons for migration in different socio-economic clusters are categorized in three main different groups, as follows:

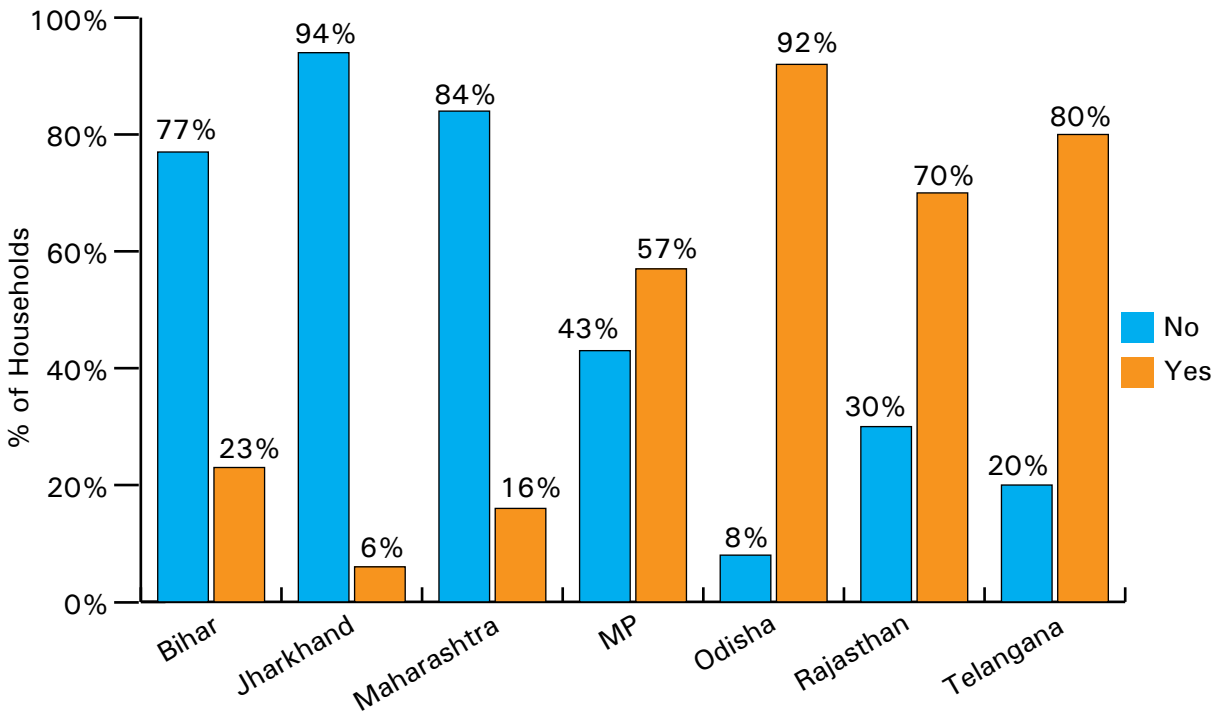
Migration as an adaptive strategy: Farming communities from the relatively upper segments (mid-size landholders) have developed additional skills or vocations, particularly in non-agricultural jobs, and used migration to improve their resilience. (for example, the *Laman Tanda* community in Telangana). It was seen that they have further invested in education and enhancement of skills. They follow a pattern of 'male-only' migration. In Jharkhand, there was a stark absence of men in the villages visited. Mostly women, children and elderly were left.

Migration as a subsistence strategy: A score of vulnerable rural households, mostly marginal landholders with lesser food security and fewer options for diversifying agricultural livelihoods having exhausted all the available opportunities, have taken to migration to subsist. These people have been moving seasonally, working mainly as agricultural labour in other relatively well-off regions or states (for example, marginal farmers from Beed are migrating seasonally to the sugarcane belt of Western Maharashtra as labourers for sugarcane cutting on a perennial basis, marginal farmers from Chhattisgarh are moving out as brick kiln labourers.

Migration as a survival strategy: Agricultural labourers tend to be affected the most by water scarcity; this impacts on-farm activities. This group often moves once faced with acute food shortages and the looming hunger season, however only in nearby regions within the state. Landless labourers from Jharkhand and Odisha tend to move out to the forests in search of Non-Timber Forest Produce (NTFP) for a period of nearly three months, along with their families.

It was observed that drought has forced a distinct change in the demography and seasonality of migrating households. Distress migration was reported from across all the states. Adolescents, entire families, and small farmers are depicting a new demographic pattern within migrants. Lack of source and destination monitoring of migration in most states (except Maharashtra) is detrimental in further exploring the trends. The number of days or season for which the families have been migrating (seasonally) has increased from three to about six months.

Figure 19: Change in Migration Pattern



While only 6 percent households in Jharkhand or 16 percent in Maharashtra indicated a change in migration patterns, nearly 80 percent households in Telangana and 92 percent in Odisha agreed that the migration patterns had changed in terms of demography and season.

In place of 'male-only' migration, children and families have started migrating in search of livelihoods. Adolescents, especially boys, have taken to migration over the last few years to combat the additional stressors, accompanying adults in seasonal migration, particularly to the cities. This has also led to reduced academic periods or simply increased rates of dropouts from schools.

In place of seasonal migration, many families from Jharkhand have reportedly decided to stay away from their villages for increased periods due to the uncertainity of climatic conditions as well as unavailability of security nets. An increasing trend of landless families migrating permanently was also reported in Telangana and Maharashtra. When asked about their plans in case of an eventuality of another drought, villagers (Taka, District Latur) indicated that they would consider moving to peri-urban areas.

Good Practice:
MGNREGS Building Resilience in Jharkhand

MGNREGS has been effectively implemented in **Arangi Vikatam** village for the construction of five *talabs* (tanks) and two check dams, improving the water availability. Farmers are now cultivating vegetables and have ensured a secured livelihood even in times of scarcity.

There are other socio-economically vulnerable segments like disabled, coupled with aggravated vulnerabilities of age, gender (women headed households), who cannot resort to migration and stick to their places of origin, with increased dependency on the social security nets like PDS and pensions that are already abysmal. These are the kind of people who cannot even take up the odd jobs that the government makes available through employment guarantee schemes like MGNREGS.

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

Lack of subsistence farming induced by water scarcity has left most of the small and marginal farmers and the landless without any agricultural activity for livelihood. Availability of employment (agricultural) has changed from 41 percent in Odisha to 99 percent in Telangana.

Providing assured employment during critical times allows people to move away from the dole and face scarcity with a semblance of dignity and self-respect. Creating 'purchasing power parity' during scarcity also empowers vulnerable rural households. Generating local labour intensive work that provides cash-for-work is a relief measure that has been adopted historically in India to combat recurrent droughts and hunger. There has also been an effort to create village level earth-work such as digging of ponds that would help in terms of water conservation in the subsequent monsoon, leading towards increased water security and self-sufficiency. This has indeed led to a degree of success in some states like Chhattisgarh where work such as digging farm ponds (*dhebris*) on small farmers' lands was taken up under MGNREGS.

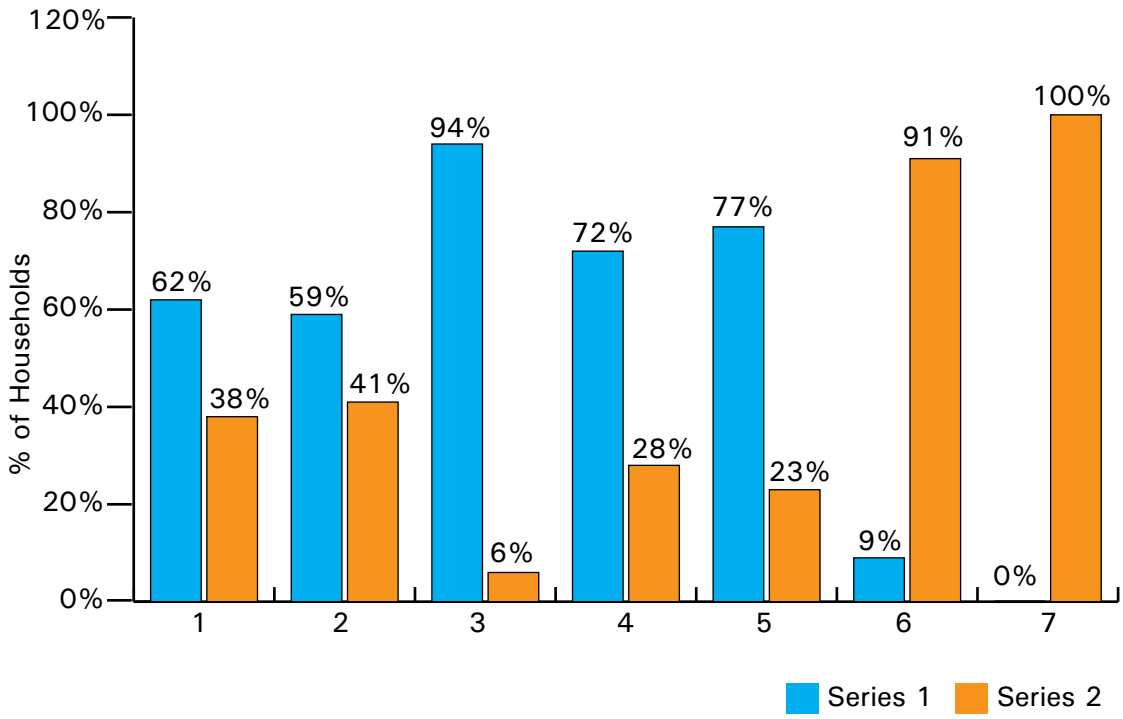
As a measure of immediate relief and an enabler for "putting additional money into people's pockets," GOI had, in 2015, increased the provisions for MGNREGS across all states affected by drought, from the previous 100 days to 150 days of employment.

However, despite good intentions, the implementation of this measure in many drought-affected states has been far from desirable. MGNREGS did not prove to be a good alternative source of income in at least five of the eight the states visited, with household dependence on the scheme ranging from 6 percent to 41 percent.

While only 6 percent of the households in Maharashtra trusted MGNREGS as an alternative source of income during drought, all 100 percent from Telangana were dependent on MGNREGS for their livelihoods.

The reasons for the low performance of the scheme include the lack of demand for the scheme from the villages, as cited by the block and district officials. On being probed further, it was evident that the demand was not there, mostly because of an inordinate delay of almost 10 months! in receiving payments. Villagers (from Odisha, Telangana) indicated that they would prefer to do odd jobs that fetch them lower daily wages regularly than take up a high-wage MGNREGS job with uncertainty of payment. This situation, coupled with lack of job cards, authentic registration, absence of Employment Guarantee Scheme supervisors at the village level (Telangana), and discord between the authorities and the PRI representatives over the kind of jobs that are necessary at the village level, has resulted in the demand for MGNREGS being considerably reduced. Villagers from Marathwada also complained that the MGNREGS funds were being diverted towards the mechanized work on mitigation measures like *Jalayukta Shivar (a project by the state of Maharashtra to make the state drought free by 2019)*. The officials, on their part, cite reasons like lethargy on people's part to do more laborious work, availability of options for livelihood, etc., for reduced demand among villagers.

Figure 20: Dependence on MGNERGS



Conclusion

Distress sale of assets and livestock has been reported as agricultural and allied livelihoods are plummeting.

Forest drought has forced families dependent on forest produce out of their environments and into the periphery of urban slums.

Employment guarantee schemes haven't worked well, for various reasons, as documented earlier. Distress migration continued in various parts of the country, with people resorting to migration as adaptive, survival and subsistence strategies, put together. Crop insurance is found to be effective in mitigating a major part of the risks involved in rain fed farming; however, this is not being resorted to, except in Maharashtra.

Multiple crop failures, food insecurity, disillusionment with assured income options provided by the Government, desertion from social security nets and risk transfer mechanisms, have together created a situation where many women are taking the lead in creating opportunities for additional income generation on their own. They are facing up to taboos and braving stares and sniggers as they begin to work outside the home, probably for the first time, selling bangles door to door to keep their children in school or trading in livestock so they can buy medicine.

EDUCATION

Situation

With the Right to Education Act (2009), India made a momentous leap towards universalising elementary education. The RTE Act is anchored in the belief that values like equality, social justice and democracy and the creation of a just and humane society can be achieved only through provision of inclusive elementary education for all.

The Integrated Child Development Scheme (ICDS) is one of the world's largest programmes for early childhood development. With a component aimed at pre-school education of children aged 3-5+ years through Anganwadi centres, the coverage of the ICDS scheme increased from 4,068 to 7,025 projects during the period 2001/02 to 2012/13. The number of Anganwadi Centres (AWCs) increased by 145 percent (from 545,714 to 1,338,732 centres) during the period 2001/2002 to 2012/13. The total number of children aged 3-5+ years, who received pre-school education in Anganwadi Centres, increased by 112 percent (from 16.7 million to 35.3 million) during the period 2001/02 to 2012/13. Girls constituted 49 percent (17.3 million) of the total number of children who received pre-school education during the year 2012/13.

The Mid-Day Meal (MDM) scheme launched in 1995 to improve nutritional levels among children studying in government, government aided, local as well as alternative schools, was extended for summer holidays to help children and prevent migration.

The Gross Enrolment Ratio (GER) for the country at primary level is high at 115 percent. However, the Net Enrolment Ratio (NER) at upper primary level is a concern and shows variation of 35.76 percent in Sikkim to 90.51 percent in Tamil Nadu. Therefore, although more children are entering the education system, many are not progressing through the system. The dropout rates go on increasing as the students graduate to higher classes. Dropout rates, particularly for girl students, are almost double for secondary classes (I-X) compared to the primary (I-IV). In rural areas, this has a bearing on the fact that adolescent girls are more involved in domestic work (tending to siblings, helping mothers with domestic chores, or small-cattle herding), letting education take secondary priority. The absence of schools close to home, lack of women teachers, and lack of early childhood care contribute to girls dropping out from school. Lack of adequate and appropriate (separate and clean) WASH facilities at schools also force girl students out of the educational system. Further, as a conventional practice in many parts of the country, many girls drop out due to early (child) marriages. There are already close to three million out-of-school girls in India.

Drought-induced scarcity exacerbates the situation as more and more children are required to contribute towards the family, either in terms of supporting the incomes that have gone meagre due to loss in agricultural productivity or in terms of supporting the harnessing of water as and when the exogenous supplies arrive. Younger children are forced to accompany parents who migrate in search of better livelihood options. Ultimately, the children's education suffers.

An effort was made during the assessment to understand the impact of drought on the education system, through visits to schools, key informant interviews with teachers and focussed group discussions with children.

Assessment findings

Most schools within the villages visited were on extended summer vacation due to severe

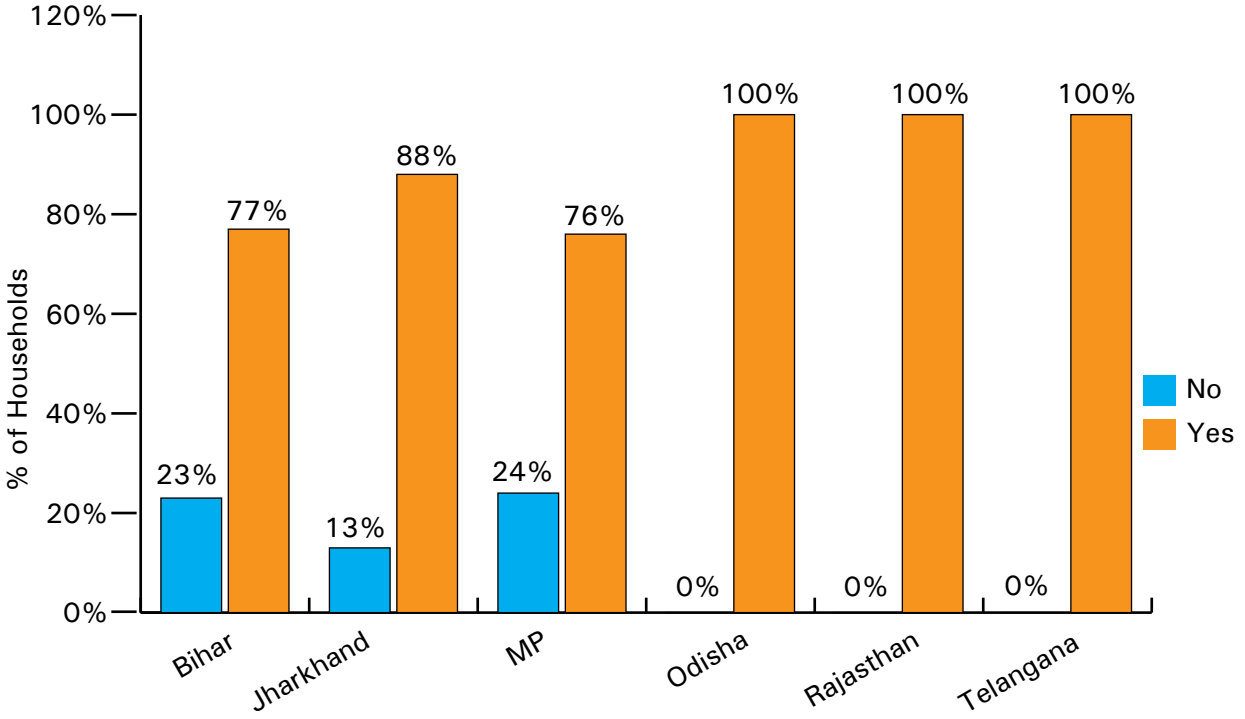
heat conditions. Academic operations, therefore, were almost at a standstill. However, it was reported that during the early summer months when the schools operated, school dropout cases had marginally increased with children, particularly adolescents, leaving the villages with their parents, who were migrating in search of livelihoods. A system of issuing Transfer Certificates (TCs) was initiated in Maharashtra under the Right to Education Act (RTE) to ensure that wherever a child went, he/she could continue education at the place of destination. Dropout rates for girl students were higher, as seen in Maharashtra and Rajasthan. Stereotypical gender roles and societal perceptions can be blamed for this. Based on Key Informant Interviews with household respondents, nearly 69 percent children attended school in villages visited in Rajasthan.

Nearly 20-25 percent school absenteeism was reported as children were engaged in fetching water or grazing livestock. Attendance at schools was hampered by the fact that children were required to spend time in supporting families, sometimes through wage earning.

Figure 21: Good Practice: MDM in Schools during Vacations in Telangana

However, children appeared to have been benefitted from attending school, even during vacations, due to the extended MDM scheme (as seen in almost all the states). MDM ensured quality meals for children at Anganwadis and schools. Children received milk, eggs and fruits, as transparently indicated on the display boards alongside. The decision to extend MDM during vacations also kept children from wandering in the heat to fetch water and kept them at school during the drought periods. Children (also siblings and parents) were reportedly happy with the quality and quantity of meals provided.

Figure 22: Availability of MDM



WASH IN SCHOOLS

Functioning of WASH services and facilities had suffered in schools due to lack of water. Handpumps in about 60-80 percent of schools within the villages visited in Madhya Pradesh had already dried up. This created an additional stress on upkeep and maintenance of already abysmal and inadequate sanitation facilities. Lack of water, dignified space for ablution and Menstrual Hygiene Management (MHM) were also some other reasons cited for absenteeism and eventual dropping out of adolescent girl students. Awareness of personal hygiene and sanitation however was quite high amongst students from all the schools but lacked in practice.

Conclusion

It is widely acknowledged that education, particularly of adolescent children, is compromised when the choice is between continuing learning or supporting their families during periods of scarcity. While older children are compelled to skip school and work in the fields, younger ones simply migrate with their parents. However, it was not possible to ascertain the relationship between the dropout rates in schools and the drought, mainly due to lack of documentation of seasonal absenteeism in the schools at village or block level. MDM had been able, to retain the children in schools and shield them from the harsh temperatures or the scarcity related burden. Nonetheless, the inadequacy of the education system to address the issues related to not only the quality of learning but also the retention of children in school had perpetuated into child labour concerns.

PROTECTION

Situation

With the highest number of child labourers under the age of 14 in the world, Indian children working in different markets have been facing problems related to malnutrition, impaired vision, and vulnerabilities to diseases like ARI and TB, while living in solitary conditions. In normal circumstances, children are seen to be engaged in agricultural work, hazardous occupations (like construction, *beedi* making, spinning and weaving, bangles and fire crackers making) and service establishments. Children engaged in domestic work are largely invisible and silent and hence face more exploitation and abuse[48].

UNICEF uses the term 'child protection' to refer to preventing and responding to violence, exploitation and abuse against children – including commercial sexual exploitation, trafficking, child labour, and harmful traditional practices, such as, child marriage[49].

With agricultural income plummeting and returns from MGNREGS becoming more and more uncertain, work opportunities for rural landless and marginal farmers are decreasing. In this situation, vulnerable families are looking for avenues for reducing one less mouth to feed. In Beed, Maharashtra, this crisis is taking the form of under-age marriages. The only work available is in sugarcane units and they pay more to couples. Thus, girls as young as 13 are being married to boys just a couple of years older. "Over the past three years, as farm

[48] Children in India 2012

[49] http://unicef.in/Story/190/Child-Protection-In-India

yields have fallen, we have witnessed at least a 20 percent rise in the number of under-age marriages," says child rights activist Tatwashil Kamble.[50]

Children subjected to violence, exploitation, abuse and neglect are at risk of death, poor physical and mental health, HIV/AIDS infection, educational problems, displacement, homelessness, vagrancy, and poor parenting skills later in life. Targeting children uniquely vulnerable to these abuses when living without parental care, particularly in the aftermath of disasters, is key to ensuring that child rights are not violated.

The Bill passed by the Parliament on July 26, 2016, amends the Child Labour (Prohibition and Regulation) Act, 1986, which prohibits the employment of children younger than 14 in 83 hazardous occupations and processes. The Amendment extends this ban on employment of children under 14 across all sectors, prohibits the employment of adolescents aged 14-18 years in hazardous occupations, and introduces more stringent jail terms and fines for offenders. However, the Bill allows children under 14 to work in 'family enterprises' and farms after school hours.

Efforts were made during the assessment to understand the impact of drought on the protection of children in terms of child labour, violence, exploitation, and child marriages.

Assessment findings


गेवराई तालुक्यात
पाणीटंचाईचा बळी

Figure 23: News on the death of a child during water fetching. A local newspaper report in Beed, Maharashtra

Women and children indeed faced increased security risks due to the chaotic situation arising at the time of accessing tanker water supplies. Casualties (14 fatal accidents) were reported when children accompanied their mothers or went alone to fetch water from far away sources that were mostly unprotected. Neither children nor adults were aware of child rights and child protection concerns. It must be assumed that the hardships and changes to normalcy during the drought exacerbated pre-existing vulnerabilities and created new ones e.g by exposing children to unsafe conditions. It was also seen that cases of risks to children existed but were unreported, for various reasons.

People from different segments of society were migrating to cope with the vagaries of nature. With more and more adolescent children accompanying their parents in search of livelihoods, the vulnerabilities of the younger children generally increased. Cases of young children and elderly left behind in the villages, as increasing numbers of working adults migrated, were particularly reported from the states of Maharashtra and Odisha. Cases of trafficking of children were reported from the villages where parents had migrated leaving the children behind.

Another concern was increased cases of child labour had increased as adolescent children were supplementing family incomes. The Juvenile Justice (JJ) Act 2006 calls for including working children in the category of children in need of care and protection. However, deprived families often see children as productive assets and, sometimes, children are forced to head the families as earning members, as was seen in some of the states like Maharashtra, Telangana and Odisha.

[50] *Hindustan Times*, April 24, 2016

However, with no proper mechanism either at the government or at community level to monitor these children, they were more vulnerable to exploitation and abuse. Child Protection Services (state or community based) were almost non-existent in most villages. At the district level, however, a Child Helpline does exist and a Child Welfare Officer is entrusted with the responsibility of dealing with cases of missing or exploited children. In Rajasthan, the state has initiated a mechanism for monitoring of child protection issues and established the Child Welfare Committees and Juvenile Justice Boards under the Juvenile Justice Act.

Cases of trafficking (Odisha) and child marriages had increased (Maharashtra and Telangana), but were not entirely attributable to the drought. Incidentally, states like Jharkhand reported that child marriages were carried out to prevent abduction of young girls at the hands of Naxalites.

Group discussions with children and community members, or the household interviews, didn't reveal any increase in the cases of child labour, child marriage, abuse, violence, and exploitation during the scarcity period. But there was lack of knowledge and sensitivity towards these critical issues. Even if the issues were seen on the surface, the lack of acknowledgement, documentation and evidence prevented remedial actions and made matters worse. There is an imminent need for a community-based village level mechanism for tracking and reducing the cases of child marriages, labour and abuse.

Conclusion

There seems to be a continued ambiguity in the definition, identification, elimination, prevention, and rehabilitation of children under 14 years of age engaged in different occupations. The amendment to the Child Labour (Prohibition and Regulation) Act passed in July, 2016 by the Parliament has also become controversial as the definition of family businesses is not crystal clear, with the loopholes leading to many interpretations that eventually hamper child rights and protection.

IMPLICATIONS FOR DROUGHT GOVERNANCE

Drought governance in India: An overview

National level

The drought management system that has been practiced in India since independence is largely a continuation of systems and schemes instituted during the colonial period. It emphasises a relief-based approach and provides certain small concessions, which do little to alleviate the distress caused by widespread crop failures owing to the continued scarcity of rainfall[51]. Drought governance at the national level depends upon information gathering, policy formulation, development of a basket of risk management measures for decision-makers, and a follow-up on effective action by the decision-makers.

Meteorological, hydrological and agricultural information from physical measurements, as well as visual observations supported through ground-based and remote-sensed data collection, is expected to generate adequate information.

The Indian Meteorological Department, Indian Council of Agricultural Research, Central Water Commission and many other central government agencies engaged in knowledge management get together to device frameworks for application of information, assessment and communication.

A basket of risk management measures is thereupon developed, comprising the monitoring mechanisms, contingency plans and mitigation strategies for agricultural, hydrological and socio-economic drought conditions.

A consistent action is thereafter taken up at the state level in terms of declaration of drought and kick-starting the immediate measures for loss estimation, mobilising funds and administering immediate relief. These are also expected to provide guidance regarding longer term (mitigation) measures, drought resistant technologies, improved crop-water-land management, livelihood sustenance, and risk transfer.

State level

Declaration of drought follows an obvious pattern across the states. Following the signs of South-West monsoon failing, with meteorological and agricultural indicators blinking (and public clamour increasing for support), a committee of top bureaucrats and technical sector experts is constituted for deciding upon drought declaration. The declaration happens by late November/early December based on:

1. Rainfall deficiency (25 percent in an area >1000 mm rainfall; 20 percent in an area with 750-1000 mm; and 15 percent in an area with < 750 mm rainfall)
2. Reduction in cropped area of 50 percent and above (or 33 percent) for all principal crops
3. Reduction in yield, 50 percent and above
4. Dry spells and their impact on crop damage

[51] Drought Manual, Government Of India, 2009

While the deficiency in rainfall is a mandatory criterion, any two of the rest of the three need to be fulfilled for drought declaration. Once the drought is declared, the government machinery swings into action for the next six months (up to the advent of the subsequent monsoon) with sectoral relief, rehabilitation and mitigation measures.

Table 11: Progression of Drought and Response[52]

Drought Types & Probable Period	Early Warning Signs	Coping Strategies Adopted by Affected Populations (large scale)	Conventional Public Response	
			From the Central/ State/ District Government (large scale)	From the NGOs (limited scale)
Meteorological Drought: **June to August**	Less, No, Erratic Rainfall	Delayed sowing, preserving the seed and buffer food stock Re-sowing	Weather watch Contingency planning Agricultural advice Support for second sowing	Weather and situation monitoring
Agricultural Drought: **September-November**	Crop growth hampered	Survival harvest Fodder storage Short term migration by males only	Status monitoring Assessment of crop damage (area & yield) Crop insurance Diesel, fertilizer, pesticide subsidy Water system repairs, Water supply planning Drought memo	Detailed assessments Food & Fodder Distribution Awareness generation
Hydrological Drought: **December-February**	Depleted ground and surface water availability	Resorting to distant water sources, Consuming less food, Longer term migration, with livestock Accessing credit societies for loans Consumption of buffer stocks	Drought declaration Relief Package Announcement Input subsidy Water tankering Food distribution Cattle camps, MGNREGS, water retention structures New bore wells	Water provision, Quality checks Hygiene promotion Food distribution Cash/Food for water retaining earthwork
Socio-economic **Drought** **March-May**	Inflation Absenteeism from schools Migration	Seeking loans from private moneylenders Pawning, borrowing Distress sale of livestock & assets Distress migration, with family Reduced expenditure on food, health and education	Drought mitigation Intensive labour and mechanized earthwork Extended MNREGS Increased PDS allocations, Crop loan waivers Mid-Day-Meals ICDS Outbreak control Credit provision Summer schools	Rainwater harvesting work Migration Monitoring Water quality improvement & provision fodder & food camps

[52] Adapted from Drought: A Humanitarian Emergency, RedR India/ Deepak Malik

While appraising the gaps in seemingly comprehensive public response, it becomes apparent that the 'tipping point' when indigenous coping capacities fail to adapt is not taken into consideration. Neither is incremental planning to help an already fragile hydro-geo-agro-eco-social system recover put into action.

Regulatory mechanisms that provide a comprehensive framework of actions, with a liberty to attempt context specific changes at the local level had been put in place but not acted upon. The Drought Manual brought out by the Department of Agriculture and Cooperation, (Ministry of Agriculture, Government of India) in 2009, suggest to adopt a more comprehensive approach towards drought response, encompassing early warning, monitoring, relief, and mitigation. However, even after seven years of its existence, the reactive, short-term relief mode continues. Knowledge products are not sufficiently shared, studied and learnings put into implement the regulatory mechanisms. Water Regulatory Authorities may have been established, but merely as an incongruous entity with no real 'authority' to enforce regulations and bring the defaulters to book. Groundwater Laws may exist, but without any proper enforcement mechanism. The governments may run schemes like water conservation and million tube-wells simultaneously, but due attention be paid to understand the need for protocols and operating procedures to be put into place, so that the conserved rainwater could be effectively harvested. A rather rigid and standard line of thinking is adopted by those within the government as well as those outside on the 'vehicle' for ushering water security. As an example, there is no review of the efficacy of large dams and effectiveness of multiple watershed development initiatives. Disaster Management Plans may exist, but they lack specific actions in case of scarcity. They are not actionable to bring about advice on what should be done in specific situations but give only broad recommendations.

The response to drought-like conditions has always been reactive, that is, more directed towards reducing or mitigating the impacts after the onset. Response do not necessarily consider the peoples' coping capacities and do not address the underlying causes, the protracted development deficits and the additional stressors that exacerbate the chronic vulnerabilities. Continuance of improper infrastructure support, inefficient service delivery and inadequate social security mechanisms add on to the development deficit. While providing certain relief to buffer impact the existing system need to be optimised and complemented by more action to address the underlying root causes of the impact of drought. Convergence is almost absent in planning and implementation. For instance, the PDS system functions but with issues related to quality and quantity and with limited provisions for tackling the scarcity. MGNREGS is essentially meant for creating employment but often job cards do not get issued in time, labour management plans not outlined and payments are often delayed.

Growing insecurities exacerbate the impact of drought and drought-like conditions, particularly on the health, wellbeing and overall development of women and children, as the most vulnerable sections of society. Little coordination is seen amongst the different stakeholders at national, state and district levels (including the communities) despite the urgency to prepare for impending crises arising out of prolonged low or consistently erratic precipitation. Government schemes are implemented, but on a selective and haphazard basis. An essential, greater common goal seems to be largely missing. Accountability towards affected populations is critical and should be used to measure the effectiveness of action, while coordinating drought response. Targeting the critically vulnerable sections amongst the vulnerable is first the responsibility of the administration. However, it has been noted that subsidies during the scarcity do exist but seldom reach the marginal farmers and the landless labourers. The elderly, women and children headed households and physically challenged persons are soften unable to access the relief from PDS, ICDS or MDM schemes provide, through community kitchens, in a dignified manner. However, it was rarely seen or reported during the visits that the practice was followed during the scarcity period.

Lack of real-time monitoring of the impacts or the changes leaves the central agencies to monitor only the targets as results of essentially a supply driven mechanism. Delivery of and return on capital and collective human investment thereby does neither get evaluated nor built into systemic rethinking of regulatory processes. Distrust about participatory monitoring and evaluation, tend to keep the affected community away from the concurrent programme implementation. Thus, an opportunity for ensuring the community (mutual) ownership and accountability towards decision-making is completely lost out.

However, short-term goals often take precedence over longer term solutions that are sustainable. 'Jaldoot' or the water train bringing water to 'parched' Latur is an excellent example of approach.

The reforms in governance are necessary to ensure that the indigenous coping capacities of affected communities are enhanced and they can build a practice and culture of resilience in responding to drought-like conditions.

Cumulative effects of recurring disasters and multiple stressors

It is commonly perceived that agricultural, hydrological and socio-economic droughts appear infrequently. However, it was seen during the assessment that the different districts visited were at different stages of progression of drought. An approximation of these stages based on deficient precipitation, soil moisture, water availability and distress created by disproportionate demand and supply of essential commodities, is indicated herewith. For example, the districts of Latur and Beed in Maharashtra, and Mahabubnagar and Medak in Telangana, which have not only faced recurrent rain stress years, seen severe drop in agricultural production, and depletion in ground water tables, but also evidenced distress sale of assets and changed patterns of distress migration, have been experiencing the socio-

Table 12: Status and Progression of Drought in Different Districts

Maharashtra	Bihar	Madhya Pradesh	Chhattisgarh	Telangana	Rajasthan	Jharkhand	Odisha
Beed	Purnea	Shivpuri	Koriya	Medak	Jalore	Palamau	Gajapati
Latur	West Champaran	Sagar	Rajnand-gaon	Mahabub-nagar	Udaipur	Garhwa	Boudh
	Gaya	Rewa	Bastar			West Singhbhum	
	Kaimur	Chhatrapur					

Drought Type	Meteorological	Agricultural	Hydrological	Socio-Economic
Typical Characteristics	Depleted rainfall, unseasonal rains, variation, reduced intensity	Crop loss, drop in agricultural production, change in food palate	Ground and surface water sources drying up	Distress sale of assets, unusual trends in migration, unusual mitigation measures

economic drought. Lack of infrastructure support and unavailability of market linkages have impacted Ganapati in Odisha adversely, which has faced a hydrological drought, while the conflict sensitivity has made Bastar in Chhattisgarh and Kaimur in Bihar cases of socio-economic drought.

The distress experienced by small and marginal farmers has spilled over on to the landless labourers and allied workforce, resulting in additional drudgery and despondency, particularly for women and children in the drought-affected districts. Reduced availability of water for domestic consumption, livestock and home-gardening negatively impacts the personal hygiene, environmental sanitation, livelihood and nutrition support for distressed rural families. This was manifested in growing insecurities in terms of water, food, nutrition, health and livelihoods across the states visited.

These insecurities transcend into the exacerbated woes of the children and women, who are the most vulnerable amongst the affected populations. Stating that over 164 million children were affected by the "severe drought situation", Nobel Peace Laureate Kailash Satyarthi said the drought across 10 states had led to rampant child marriage, child labour, abduction, and trafficking of children. The Marathwada region has seen about 3,500 children pushed into child labour and trafficking[53]. Drought and ongoing water crisis have made the children increasingly vulnerable. "Disturbing reports of families leaving their girl child in temples to work as *devadasis* are coming from states like Karnataka, Marathwada in Maharashtra, and Telangana," Satyarthi said during a press interaction in Delhi.

"Abuses against women increase during drought – women were forced to become prostitutes, men demanded more dowry to compensate for lower farm incomes, and there were more dowry deaths if the women could not conceive because they are malnourished". Varsha Deshpande, a Lawyer and Women's Rights activist[54].

For a country that has just 4 percent of the world's water resources to cater to a population that is 16 percent of the world's total population, the concern should be about the ways in which water is utilised. The urban water demand is more than three times the rural. In terms of domestic water supplies, preference is given to the urban demand thus discriminating the rural communities. Even with an underdeveloped command and an insufficient irrigation network, agriculture use accounts for 80 percent of the country's total water consumption. Water-guzzling crops, such as rice and sugarcane, are the single biggest threat to its plunging water table.[55] According to McKinsey Consulting's 2030 Water Resources Group, India will be one of the largest centres of agricultural demand for water by 2030, with projected withdrawals of 1,195 billion cubic meters in 2030. This will require a doubling of its usable water generation.

With unaddressed demands for multiple water use, unchanged crop water management practices, inappropriate and near-obsolete technologies for water utilization on farms, unfair and inequitable pricing and distribution of water, the situation would fast worsen into what could become a humanitarian crisis.

[53] *Times of India*, May 3, 2016

[54] *Hindustan Times*, May 23rd, 2016

[55] 'In times of drought, overuse of water behind India's dry days,' Zia Haq, *The Hindustan Times*, April 24t, 2016

RECOMMENDATIONS

The climatic changes are significantly altering the health of humans and natural ecosystems. Increasing temperatures and projected changes in the hydrological cycle are leading to an increase in temperature-related illnesses, vector-borne diseases, health impacts related to extreme weather events (particularly, floods and droughts), and health effects due to food insecurity.

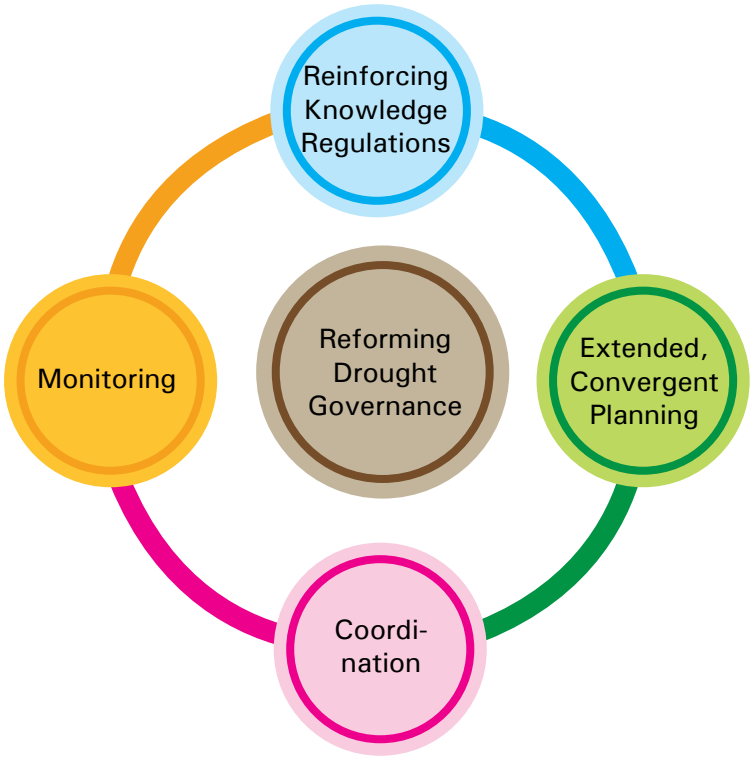
For the drought response to be more effective, the evolution, complexity, peoples' vulnerabilities as well as socio-economic and political implications need to be internalized. There is a need for focused action within and across sectors at national and sub-national level with a humanitarian lens enhancing accountability towards affected population and most vulnerable women and children for drought-proofing India. The solutions must be more localized than centrally driven, participatory rather than officious, demand responsive rather than supply driven, and in tune with the longer-term development process rather than isolated. The priorities for action[56] could well be:

Recommendations for national government

1. Strengthen drought governance through coherent national and local frameworks of laws, regulations and public policies, with defined roles and responsibilities and guidance and encouragement to the public and private stakeholders to take collective action for addressing drought risks.
2. Strengthen participatory risk mitigation mechanisms to account for diversity of needs and environmental conditions in the drought response. Understanding the drought risks and particularly the underlying, chronic vulnerabilities to enable people centred policies and practices is pertinent. There should be periodical assessment of vulnerability, capacity, drought characteristics and its sequential effects at relevant, social, temporal and spatial scale.
3. Invest in drought risk reduction to build resilience: Pooling of public and private investment to enhance socio-economic and ecological resilience. These could become drivers of innovation, growth and job creation.
4. Enhance drought preparedness for effective response: Build capacities at different levels for preparedness and contingency planning considering climate variations and their impact on drought like conditions. Invest in developing, maintaining and strengthening people-centred drought forecasting, early warning systems.
5. Device social protection mechanisms (safety nets) to advance adaptive and absorptive capacities. Promotion of connect between humanitarian action, development outcomes and risk reduction through planned use of social safety net, is key. Policies should be such that they could be implemented over short- and medium-term to help the rural small and marginal farmer reduce the amount of time taken for recovery of losses and regain productive capacities. Drought impact should be continually monitored to enable designing agricultural damage compensation packages in the longer run for the farmers suffering from drought and take appropriate measures for mitigation at local level.

[56] Adapted from Sendai Framework for Disaster Risk Reduction, 2015-2030

6. Harness traditional community-based water management practices. Various states in the country, from water-rich Bihar to water-scarce Rajasthan have a rich culture of different community based water management practices that have been internalized as traditional coping mechanisms through ages. We must acknowledge that the drought conditions were quite successfully tackled by people earlier, without forgetting that many of the indigenous systems in the country were better equipped.
7. Good practices and good advice for drought risk reduction and resilience building are seen aplenty, within the community or the government mechanisms. While such good practices, being emulated elsewhere through proactive bureaucracy or voluntarism, need to be comprehended and strengthened, the non-performing or seemingly unreasonable government or non-government alternatives should be equally regulated to ensure alignment of policies and programmes.[57]
8. Regulatory frameworks need to be more informed, equipped and reinforced to deal with the practical anomalies. Convergence has been discussed a lot but implemented little. Possibly an extended time for planning drought response would help in bringing the early warning, preparedness, mitigation and response together and establish a link with longer term planning. Coordination of response could be brought down to a level that is closer to the ground. Participatory Real-time Monitoring and Evaluation would help in obtaining unintended outcomes beyond the intended results, feeding back the lessons into regulatory processes and, importantly, further creating an ownership and a sense of accountability.



9. Call for National Platform to reconvene and provide forum for regular, systematic exchange of hazards and risks and lead action through advice and coordination for appropriate drought management.

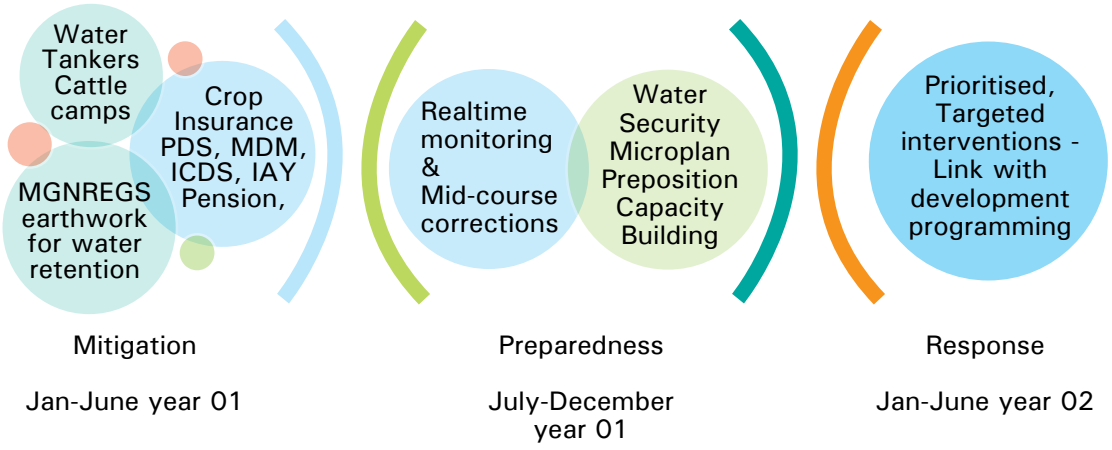
[57] "How Did the 2012 Drought Affect Rural Livelihoods in Vulnerable Areas: Empirical Evidence from India," Udmale P D, *etal, International Journal of Disaster Risk Reduction.*

10. Call for setting up of State Platforms to consider drought, but also other hazards including floods.

Overall, the Drought Governance needs to be reformed with:

11. Drought Manuals integrating empowerment of water regulatory authorities and implementation of groundwater regulation act, in states where it has not been implemented.
12. A uniform decision support system should be devised to guide the decision-making processes at the district level in drought declaration, relief, mitigation and overall response. A decision support for conjunctive (surface ground) utilization of water is also necessary.
13. There should be extended planning process for drought management, comprising mitigation, preparedness and targeted response, spanning over 18 months instead of the current period of six months. This would allow an overlap of the subsequent monsoon season, initiate monitoring of the impact of mitigation, and allow deployment of course corrections amenable to climate change variations in a targeted manner. This approach would incorporate the essential elements of humanitarian programme cycle into the drought proofing and facilitate responding to drought using a humanitarian lens with the required urgency and preparedness. The linkage with the development programming would be established in a cascading, gradual manner over a period of 18 months. Early warning built on monitoring, preparedness and prepositioning could provide a backward linkage with current 'Relief- (Short Term) Mitigation' phase while the targeted response arising out of mid-course corrections would provide a forward connect with regular development programming. Integration of hydro-meteorological risk management into longer term agricultural (soil-crop-water) planning would help ensure that the development gains do not get eroded and build back better.

Figure 24: Conceptual Framework for Extended Planning



[58] Short term solutions (*Jalayukta Shivar Abhiyan in Maharashtra, Jal Swawalamban Yojana in Rajasthan*) linked with longer term planning processes. Alternatively, spending for public water infrastructure (*Mission Kakatiya* in Telangana) could also be employed for providing relief to individual farmers on their farmlands (ponding). Previous watershed interventions need to be repaired and maintained.

14. Interventions planned and implemented under the Drought Monitoring Centre for State, needs to focus more on integrating Ridge to Valley, (Surface) watershed development with participatory aquifer (Subsurface) management. Soil and water conservation should be done based on geology and geomorphology, appropriateness of measures, and greater focus on permanent soil and moisture conservation. Water budgeting should be made mandatory for the water security planning process covering the water requirements for human, animal and agricultural consumption in a watershed.
15. There should be closer-to-ground coordination (including information management) of drought response at block level with 'block' as a unit for knowledge transfer for understanding and addressing the varying impact of drought.
16. Rigorous real-time monitoring and surveillance of surge support interventions, including timely income generation (demand creation and timely wage payment in MGNREGS), food distribution (PDS), water safety (chlorination, Open Defecation Free), and security planning, etc., should be carried out in a participatory manner in coordination with local NGOs and affected communities. Innovative ideas and state-of-the-art technologies should be deployed in ensuring participatory data collection and analysis.
17. Regenerative Development and Design[59] should be built into the planning process, establishing the integral link between the sustainability of forests, water security and open defecation free environment and metamorphosing the affected populations along with the service providers into co-creators of sustainable development approach. This approach would help address climate change and environmental degradation to achieve sustainable development.
18. Leverage public funding additional to public-private partnerships (PPPs), Corporate Social Responsibility funding, and MP Local Area Development Fund should be explored for raising additional revenues and collective ownership, with a focus on disaster risk reduction. It is important to ensure that the funding is prepositioned and released in a timely manner.

Additionally:

19. Taken into consideration innovative non-conventional surveillance, for example, crowd sourcing.
20. MGNREGA payments linked with consumer price index and frequency of payments needs to be increased to 3-4 days interval.
21. Crop insurance policies and reimbursements should be reinforced. Disbursement of crop insurance, loans and subsidies should be completed before start of the next cropping season (by May 15).
22. Establish minimum support price for rain fed crops.
23. Include chronically drought affected blocks in the major livelihoods missions like National Rural Livelihood Mission.
24. Reinforce architecture and regulations for ensuring nutrition security, incorporating the ICDS, MDM and PDS.
25. Sensitize the functionaries at public service delivery institutions at village and block level towards the impacts of climate variabilities and the exigencies of the actions thereupon.

[59] Adapted from Tommy Lehe, 2016, http://www.wiredroots.org/transforming-the-human-narrative-the-rise-of-regenerative-development-design/

Recommendations for state governments

Regulation and knowledge management

1. Include drought as part of the State and District Natural Calamity Committees.
2. Promote appropriate technology for monitoring ground water table level at the community level.
3. Strengthen state and district level architecture for enforcement of Ground Water Act should be strengthened.
4. Disaster response standards for different sectors for implementation through District Disaster Management Authority (DDMA).

Planning

5. Include village development plans contextualized crop diversification, farm and non-farm activities planning.
6. Include water requirement for livestock (also small ruminants) and public institutions in drought response planning (tanker water supply).
7. Strengthen supply chain system of emergency medicine and immunization.

Coordination

8. Ensure involvement of (accredited) NGOs and CBOs in coordinated drought responses.
9. Well-coordinated Implementation of the State Action Plan for Climate Change (SAPCC) and the State Disaster Management plans should be updated with role clarity between different departments.
10. Appoint a dedicated coordinator at the district level to support the District Magistrate in managing the coordination of drought response. The coordinator should be supported by nodal officers at the block level for overseeing the implementation.

Monitoring

11. Monitor the implementation of SAPCC and DM plan through result/impact oriented indicators.
12. Undertake stringent participatory monitoring of toilet construction and usage to ensure standards and achievement of SBM goals.
13. Promote introduction of Community Based Monitoring (CBM) in civil supplies (PDS), health services, nutrition and protection.
14. Monitor population movements at the host and destination zones to track and control distress migration.

Sectoral recommendations

Water, sanitation and hygiene (WASH)

1. Encourage revival of dug well recharge systems, and dig new wells for recharging shallow piezometric horizons.
2. Implement water security planning at the village level and other official infrastructure as a high priority in water scarce areas, also covering Anganwadi, PHCs, schools (institutions).
3. Accompany toilet constructions by a water security plan and/or create toilet designs that are less water intensive.

Nutrition

1. Provision of special food basket during emergency situations, inclusive of indigenous, localized food.
2. Encourage and provide technical support for the establishment of kitchen gardens, community and school gardens with less water intensive and drought resistant crop varieties.
3. Provide capacity building for Anganwadi Worker (AWW) with strengthening of Management Information Systems (MIS).

Health

1. Strengthen emergency Public Health Preparedness and Response System and it should be reinforced through DDMA and local government bodies.
2. Sensitize health institutions at village and block level and equip them to deal with extreme weather events like heat waves during drought conditions.

Food security

1. Decentralize production and supply of seeds suitable to local climate conditions should be.
2. Promote micro irrigation and other soil moisture conservation measures and provide technical advice for.
3. Improve linkages between meteorological information and district-level agriculture.
4. Ensure carpet coverage of PDS with provision of multi-grains in severely drought-affected areas.
5. Promote poly-cropping with perennial varieties of grains and pulses rather than mono-cropping.
6. Promote organic farming for better soils and lower crop vulnerability.

Education

1. Conduct special coaching and learning activities (on the lines of UNICEF Summer School experience in Telangana) for children availing MDM to add value to their presence at school campus and prevent them from migrating along with their parents through awareness training and dialogue with parents and communities.
2. Implement water safety planning at school level to enable the school children to understand the risks to sustainability of water.

Protection

1. Institutionalize village-level mechanisms for reduction in child labour and early marriages through sensitization of service delivery mechanisms on issues related to protection.
2. Establish a Panchayat Raj Institution based tracking system (Janani Janam Dost), which monitors progress of girl child since birth to adulthood to ensure protection against trafficking and other forms of exploitation, adopt laws and regulations and enforce protection from child labour to avoid let down particularly during distress periods.

Specific recommendations for UNICEF

1. Prioritize drought affected districts for UNICEF-supported strategic and thematic interventions in coordination with the state authorities, to ensure that the conditions of those relatively less affected do not deteriorate further.
2. Develop clear indicators for assessing impact of drought on various sectors like WASH, Health, Nutrition, Food Security. Advocate for introducing the measurement at field level (for example, MUAC and Height to Weight Index measurement system should be introduced for measurement of stunting as impact of drought).
3. Develop sector programme-wise Standard Operating Procedures (SOPs) for drought response in collaboration with the respective line departments (emulating the WASH SOPs developed with the Ministry of Water Supply and Sanitation).
4. Support knowledge management process for reinforcing the Ground Water Act and National Food Security Act through collaborated action research and lessons learning.
5. Conduct institutional WASH needs assessment in various institutions and systems including village and block levels to understand the status of preparedness and resilience to climate variabilities and ability to deliver services consistently.
6. Conduct detailed in-depth health, education and protection sector impact assessments at least in some of the visited states (on the lines of the Nutrition Assessment) to explain the drought attributability behind exacerbation of various underlying causes and understand the critical impact of drought-like conditions on women and children in the purview of health, education and protection.
7. Develop action plans to sensitize school staff on issues regarding migration of parents impacting protection, and food security of the child.
8. Support establishment and reinforcement of Child Protection Committees (CPCs) at the village level with defined responsibilities to curtail child/secret marriages due to drought-related distress.

9. Promote and use U-report, a new mobile phone based social message communications technology, for drought monitoring and response as well as measuring social mobilization efforts for drought-proofing.
10. Compile sector-wise cases of sustained good practices and success stories of drought resilient communities to inform the regulatory mechanisms and revisit conventional practices.
11. Run awareness campaigns for rebuilding local knowledge regarding the importance of drought resistant crops, land use planning and water management practices.
12. Provide advocacy and knowledge support for regular upkeep, maintenance and participatory re-development of traditional community-based water harvesting and crop-water management practices and institutions for help preventing the culture from abandonment of such good practices.

ANNEXURE

ANNEXURE – 1

LIST OF STATES, DISTRICTS AND VILLAGES COVERED DURING THE ASSESSMENT

S. N.	State	District	Block	S. N.	Villages covered for Drought Assessment	S. N.	Additional villages covered for Nutrition Assessment
1	**Maharashtra**	Beed	Dharur	1	Ambewadgaon		
				2	Awargaon		
			Georai	3	Agar Nandur		
				4	Mategaon		
			Kaij	5	Bansarola		
			Shirur-Kasar	6	Wadali		
		Latur	Ahmadpur	7	Parchinda		
				8	Chingoan		
			Ausa	9	Tak		
				10	Masodhi		
			Jalkot	11	Wanjarwadi		
				12	Umerdara		
2	**Bihar**	Purnia	Srinagar	1	Patna Rahika	1	KhutiHasaili
				2	Debinagar	2	Hasali
				3	Makhnaha	3	Kadgama
				4	Cinghiya Bhakta	4	Chanka
						5	Dhamailli
						6	Khokha (south)
						7	KhutiDhanaili
						8	Uperail
		Gaya	Gurua	5	Nagmagarh	9	Nagwan
				6	Nahueda	10	Salempur
				7	Chilora	11	Nurpur
				8	Akhotra	12	Mehamadpur
						13	Bara (chilaur)
						14	Parsavankalan
						15	Bara (Paluhara)
						16	Domiyan
						17	Naser

S. N.	State	District	Block	S. N.	Villages covered for Drought Assessment	S. N.	Additional villages covered for Nutrition Assessment
	Bihar	West Champaran	Gaunaha	9	Bhikhnatodi		
				10	Bhatujila		
				11	Ekwah		
				12	Parsadih		
		Kaimur	Adhaura	13	Lohra		
				14	Kotamdag		
				15	Sarodag		
				16	Sohdag		
			Nuaon	17	Chattabarhi		
				18	Pajraon		
				19	Tota		
3	**Madhya Pradesh**	Chhatarpur	BadaMalhara	1	Kunwarpura Kalan		
			Lavkush Nagar	2	Bachchon		
			Bijavar	3	Kupi		
			Gorihar	4	Kauntha		
		Rewa	Hanumana	5	Piprahi		
			Java	6	Iturni		
			Naigadi	7	Naraini		
			Sirmaur	8	Bagdah		
		Sagar	Banda	9	Patri		
				10	Richai		
			Jaisi Nagar	11	Hinnod		
				12	Sethiya		
		Shivpuri	Shivpuri	13	Raisree		
				14	Kanwarpur		
			Pohri	15	Lengra		
				16	Umrai		
4	**Chhattisgarh**	Rajnandgaon	Rajnandgaon	1	Ghumka	1	Patewa
			Chhuriya	2	Gopalpur	2	Uparwah
				3	Pendridh	3	Saloni
			Dungargarh	4	Motipur	4	Khobha
				5	Jandatalab	5	Telanbandha
						6	Ramatola
						7	Tatekasa
		Bastar	Bakawand	6	Baniagaon	8	Gunpur
			Bastar	7	Bhaisgaon	9	Narayanpal
				8	Ghotiya	10	Chotedewada
			Bastanar	9	Nutanpal	11	Talnar
				10	Bastanar	12	Kelepal
			Durbha	11	Dhodrepal	13	Brigali

		Koriya	Baikunthpur	12	Amapara		
				13	Badgaoun		
			Sonhat	14	SalgaounKalan		
			Manendragarh	15	Lei		
				16	Amritdhara		
			Janakpur	17	Dhogatal		
5	**Telangana**	Medak	Narayankhed	1	Abbenda	1	Almaipet
				2	Ujjvalampahad	2	Kichanapally
			Andol	3	Posanipet	3	Pothareddipalle
				4	Kodiigal	4	Yerraram
						5	Narayankhed
						6	Irakpally
						7	Dowuru
						8	Venkatapur
		Mahabubnagar	Bomraspet	5	Chilmalmailaram	9	Shaikpally
				6	Dudiyal	10	Ayodhanagar
			Hanwada	7	Mumimoksham	11	MotiGhanpur
				8	Gundiyal	12	Nandaram
			Kalwakurti	9	Marchela	13	Ammapally
						14	BalajiKuntaTanda
						15	Rajapur
						16	Mudireddyphally
						17	Kucherkal
						18	Tirumalapur
6	**Rajasthan**	Udaipur	Lasadiya	1	Samel	1	Rajol
				2	DhoklaTalaaba	2	Grasiaphala
			Rishavdeo	3	Paderi	3	Khojawada
				4	Kalyanpura	4	Kalyanpur (Naiphala)
						5	Delena
						6	Kharadi Phalla
						7	Semalphala
						8	Motivilla
						9	Kataarphala
		Jalore	Sanchore	5	Bawarla	10	Suthari
				6	Sarwana	11	Akodia
			Chitalwana	7	Sankariya	12	Bhola Ki Kuti
				8	Khejiriali	13	Sarvana-li
						14	Khaswa Lalinyo Ki Dhani
						15	Vasant Chauhan
						16	Keelwa
						17	Dadusen

S. N.	State	District	Block	S. N.	Villages covered for Drought Assessment	S. N.	Additional villages covered for Nutrition Assessment
7	**Jharkhand**	Ranchi	Lapung	1	Pokta		
			Khutpani	2	Beenj		
		West Singhbhum	Tonto	3	Suiamba		
		Palamu	Chatarpur	4	Khonga		
		Garhwa	Meral	5	Bana		
8	**Odisha**	Boudh	Kantamal	1	Tilikamal		
				2	Nendrimal		
			Harbhanga	3	Bairingi		
				4	Gochhasahi		
		Gajapati	Gosani	5	Madhusudanpur		
				6	Battisiripur		
			Rayagada	7	Kumilising		
				8	Sarada		

ANNEXURE – 2

METHODOLOGY FOR NUTRITION ASSESSMENT

The methodology for the nutrition assessment was adapted using SMART (Standardized Monitoring and Assessment of Relief and Transition) survey protocol. Being rapid in nature, it was not possible to follow complete SMART methodology and protocols for sampling.

In each state, two districts were identified that were affected by drought; in each district 12 of the most affected villages were selected by the state and local authorities where the assessment was undertaken. In each state, teams visited a total of 24 villages.

2.1 Target population

The target population for the anthropometric survey was all children aged between 6 and 59 months as they represent the most vulnerable portion of the population. In selected households, all eligible children were measured, along with their mothers. The target group for the Infant and Young Child Feeding (IYCF) survey was all children aged between 0 and 23 months, as recommended by IYCF indicators. IYCF and food security questions were asked from mothers or caregivers.

2.2 Sampling

The 12 villages affected severely by drought were selected from each district. Based on the availability of the information within the village (size of the village), teams used simple or systematic random method to select the households. If the village was too large or too scattered, teams introduced cluster sampling, that is, divided the village into clusters and, based on PPS (probability proportional to size), selected a cluster randomly for the survey.

2.3 Household selection techniques

The teams enumerated every household present in the selected cluster through a door-to-door survey. During the door-to-door survey, teams marked on their lists households with children between 0-59 months. A complete and updated list of all the households was then used to identify randomly 10 households with children (0-59 months) using a random number table or sampling interval.

The selection of the households was conducted with the help of enumeration of the households and using random sampling methodology in the field. For the selection of the households based on the number of households in each cluster, the following methods were used:

Simple Random Sampling: If a village had less than 100 households, then enumeration of all the households was done by the field teams.

Systematic Random Sampling: If the village had households ranging from 100 to 150, then systematic random sampling method was used. Based on the enumeration, a list of households with children was prepared. The total number of households with children were

counted and then sampling interval 'k' was calculated depending upon the daily sample (here the daily sample is 10).

Segmentation method: If a village had more than 150 households or was too scattered, it was segmented into sub-units/cluster, using either man made (schools, temples, special buildings, etc.) landmarks or natural (river, mountains, farms, etc.) geographic landmarks. Then, PPS (probability proportional to size) was introduced to select the sub-unit where the complete enumeration would be done and, based on the condition mentioned above, either simple random sampling or systematic random sampling method was used for selection of households.

2.4 Sample size

The target for the assessment was to cover at least 250 children (minimum 125 in each district) aged between 6-59 months in each state for anthropometry. The mothers of the measured children (6-59 months) were included in the assessment too for anthropometry.

Based on the survey goals, it was calculated that every team had to visit 10 households with children between 0-59 months per day and collect household food security information from five households (every second household) for food security assessment.

ANNEXURE – 3

STATE REPORTS: SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

4.1 Maharashtra

KEY FINDINGS (from Beed and Latur districts)

The consecutive three-year drought like conditions faced by Maharashtra culminated in a severe drought in 2015/16, impacting 28,662 villages in 28 districts of Marathwada, North Maharashtra and Vidarbha.

1. Impact on water availability and supply

1. The surface water management during the drought situation in Maharashtra was unique. Every surface water source was monitored, tapped and managed for drought response. About 36.3 million litres of water were supplied to 1,687 habitations in a six-month period at a cost of ₹ 102.1 million.
2. With the growing conviction that ground water needs to be treated as a common property resource, the government of Maharashtra legislated the Maharashtra Ground Water Act in 2009. Compliance continues to be a challenge as there are no structural mechanisms for monitoring the implementation.
3. Rampant digging of private deep wells continues, with as many as 200 dug in just the last two years in one of the villages visited.
4. The quality of water supplied was very poor, with visible physical impurities. Most villagers managed their drinking water supply from functioning water sources in their villages itself or from nearby private sources. In some cases, villagers even travelled 2-3 km by bicycle to collect potable water.
5. In villages without alternate sources, even purchasing of potable water was a better option than consuming tanker water. In such cases, there was an average incremental family expenditure of ₹ 1000/- to ₹ 1500/- per month per family for water alone.
6. Unfortunately, institutional water requirements of the PHCs, sub-centres, schools and Anganwadis were not been considered and subsequently not supplied. Lack of water storage mechanisms was one of the reasons stated. This hampered the operations at these centres.
7. Equitable distribution of water continued to be a challenge. The outlying hamlets, usually inhabited by the marginalized communities, got far lesser water than the hamlets inhabited by the mainstream strata. Even at the time of water supply, there was undisciplined crowding, resulting in the elderly and women headed households being unable to get their adequate supply.
8. The extended periods of load shedding led to erratic water supplies. Children were involved in water collection. This affected their study time, school time and, more importantly, their safety.
9. There were 14 fatal accidents reported among children in Beed alone, because of the water collection methods.

2. Health, Sanitation and Hygiene

1. The district sanitation coverage was: Latur 57 percent and Beed 38 percent. The villages visited had a coverage ranging from 30 percent to 80 percent. Utilization of toilets, wherever available, was drastically reduced, with 80 percent of families visited practising open defecation due to water scarcity. Toilets were used only by women and girls, in "case of emergency." Reverting to OD practices, especially among first generation users, reversed all the good that SBM has tried to accomplish.
2. Children defecated in the village vicinity and sometimes even close to potable water sources. With no water disinfection being practised, this was a source of concern, especially during water scarce times.
3. Reducing the frequency of bathing and washing of clothes, reusing bathwater for cleaning the house, replacing soap with alternate materials like ash and mud for bathing, were some of the changes observed due to reduced water availability.
4. Women and adolescent girls stated that the scarcity of water had impacted their menstrual hygiene practices. Apart from this, the women and adolescent girls had also stated reducing their food and water intake during the day to minimize their need to urinate or defecate during the daytime.
5. The practice of washing hands at critical times was continuing, but with alternate cleansing materials like mud or ash. Even if the practice was not prevalent, the knowledge on the need to wash hands during critical times seemed universal.
6. There was overall reduction of water supply to the health facilities in Beed and Latur due to drought. Water supplied at the district hospitals was far less than the Indian Public Health Standards norms. There was no tanker water supplied to the PHCs and sub-centres. In Beed, major surgeries had to be postponed for about a week due to the scarcity of water.
7. The number of cases of gastro-enteritis, diarrhoea, dysentery, jaundice, and malaria, as reported in the Integrated Disease Surveillance Programme, increased during 2015/16, as compared to 2014/15. In Beed district, there was an increase in gastroenteritis (from 3,948 to 11,570), diarrhoea (from 4,079 to 14,126) and dysentery cases (from 5,835 to 20,822), whereas in Latur there was an increase in dysentery cases (15,923 to 19,213) and diarrhoea (from 8,285 to 8,715). No water borne diseases were reported in either Beed or Latur.
8. There was no increase in maternal or neo-natal deaths. However, there was an increase in low birthweight babies and stillborn. The increase in low birthweights seen in the last two years can be attributed to the poor food and nutrition intake of the women in the last three years due to the adverse impact of drought on livelihoods and thereby their food basket.

3. Impact on Education

1. Children, both boys and girls, but mainly girls, were intensely involved in water collection activities. This adversely impacted their study time as well as their class time. Girls were the most affected as even during normal times their education is secondary and the drought exacerbated the situation.
2. Education was generally limited to whatever level of free education was available within the village. Very few, especially girls, went out of the village for higher education. But now even boys were dropping out after completing the level of schooling available within the village and seeking employment in peri-urban or urban areas close to their villages.

3. Increased family based seasonal migration, mainly to sugarcane belts, had resulted in more children dropping out of mainstream education. The hostel facilities initiated by Government of Maharashtra for children of seasonal migrants were utilized only by very few children, mainly boys.

4. Impact on Livelihoods

1. Three years of successive drought or drought-like conditions had completely eroded the livelihoods, mainly of the farming communities. Every family had borne losses ranging from ₹ 15,000 to ₹ 60,000 on an annual basis.
2. Productivity of all the major crops like cotton, soya, pulses, and sugarcane had dropped by more than 60 percent.

- Due to increased rates of fodder, there was additional requirement of ₹150 per day per animal, which was not part of initial expenditure. There was a reported increase in expenditure of ₹ 2000 - ₹ 2500 month for a family of five members, largely for purchasing vegetables, fodder, cooking oil, and sometimes drinking water.
- Livestock, a mainstay of the families in Latur and Beed had dropped by 50 percent and the milk production by about 75 percent. Distress sale of cattle was one of the main causes for this drop. Cross-breeds valued at a unit cost of ₹ 80, 000 had been sold off for less than ₹ 20,000. There were 278 cattle camps set up in Latur and Beed.
- There was a marked increase in the number of farmers covered under the crop insurance scheme of the Government of Maharashtra, with more than 70 percent coverage in 2015/16. The claims were yet to be released at the time of the survey and were expected to be done in the coming weeks. Due to this delay, the farmers still had to depend on money lenders for procurement of seeds and fertilisers.
- Almost all farmers visited were heavily in debt to private money lenders. None of the farmers in the villages visited had access to bank loans.
- Although the Departments of Agriculture and Animal Husbandry had been trying to bring about a change in cropping patterns, irrigation practices as well as promoting small ruminants instead of large ruminants, these were not very successful as the farmers were still banking on one good season of cash crops that would help them to wipe out their debts.
- There was a marked increase in the number of families migrating either for seasonal agricultural work in the sugarcane fields or permanently to urban and per-urban areas like Aurangabad, Pune and even Mumbai, as unskilled labour.
- MNREGA was not seen as a viable income generation mechanism in any of the villages visited. Even in places where MNREGA was available, there was criticism that it was not equally available to all or that it was coupled with *Jalyukt Shivar Abhiyan* (JSA) or Water for all - Drought-free Maharashtra 2019 and machinery utilised in place of human labour.

5. Impact on Food Security and Nutrition

1. The pro-active response of the administration in making available rice and wheat through PDS in all the drought-affected villages and to all the families in the village has been a great success. There was a 100 percent dependence on PDS as observed in all the villages visited.
2. There was a differential impact on food security and nutrition, with the landed farmers having enough stock of their staple food items like *bajra* (pearl millet) and *jowar* (sorghum), whereas the landless labourers had to depend on the open market even for *jowar* and *bajra*. This has led to a change in their dietary habits, with rice and wheat replacing *jowar* and *bajra*, which most of them are not comfortable with.

3. All the home kitchen gardens were wiped out due to the successive droughts, making the communities totally dependent on the open market for vegetables. With the sharp escalation in the cost of vegetables, this was more of a luxury than a non-negotiable ingredient of their food basket. The decrease in the milch animal population had all but wiped out milk also from their daily menu.
4. Decrease in the quantity of food intake was stated as the coping mechanism of more than 80 percent of the families interviewed. Household food distribution adversely impacted the women and adolescent girls intake, as they take food only after the children and the male family members have completed their meals. This lack of proper nutrition was probably one of the main causes of the low birthweights noticed in the last couple of years.
5. The noon meal scheme in the schools and the ICDS centres were highly beneficial to the children during this drought period. However, no fruits or eggs were supplied over the last couple of years. The supply of rice has also been discontinued since the last few months. This is due to a change in policy of The Government of Maharashtra (GoM) level, shifting the responsibility of the noon meal scheme at the Integrated Child Development Scheme (ICDS) from the Department to the local SHGs, which has not become functional so far.

6. Governance of Drought

1. Despite not having a state-level Drought Manual in place, the officials had made their drought response plans as per the National Level Drought Manual of 2009. The Government of Maharashtra (GoM) has in place the Ground Water Act to protect the ground water sources from unsustainable extraction. They have also embarked on an ambitious project, the JSA, for enhancing water sustainability through watershed development programmes.
2. With a cropping practice that is heavily dependent on groundwater, more than 80 percent of the benefits went to the landed families who constitute less than 20 percent, but the greatest impact was felt by the landless 80 percent of the families. There was no evidence of water audit and water budgeting being done either at the state level or at the district/village levels.
3. Convergence between various welfare schemes, like MNREGA with SBM or JSA, may have resulted in optimum utilization of available financial resources, but had adversely impacted the employment guarantee of the communities, especially wherever mechanized work replaced human labour. This dilution of the primary focus of MNREGA is a matter of concern, more so in drought-affected villages.

7. KEY RECOMMENDATIONS

1. A Drought Response Manual should be developed for the state, with detailed guidelines on decentralized management.
2. Planning for source and service sustainability should necessarily be on a long-term basis of 10 to 15 years.
3. PRIs and water related CBOs should be strengthened, both technically and financially, to revive and manage village water supply schemes wherever possible.
4. There should be support packages for incentivizing changes in cropping practices.
5. There should be flexi-timings for educational institutions in villages affected by drought.
6. Develop annual health facility-wise contingency action plans to ensure uninterrupted, safe and adequate water supply to health institutions.

7. Roof rain water collection units should be promoted for use in institutional toilets (PHCs, schools and Anganwadis).
8. Cost effective sanitation models that consume less water should be promoted.
9. PDS (Public Distribution Systems) should supply *jowar* and *bajra* in drought-affected villages till livelihoods are resumed.

4.2 Bihar

KEY FINDINGS

1. WASH

1. Fetching time for drinking water in Adhaura and Gurua blocks had increased.
2. Shallow hand pumps and wells and other surface water sources in Gurua and Adhaura blocks had begun to dry up.
3. Eighty-five percent hand pumps were defunct in Adhaura block and the stress on the local chua had increased.

2. Food Security and Nutrition

1. There was increased dependence on PDS for grains (though PDS was irregular).
2. In Adhaura block, children were seen eating only rice and salt for their afternoon meal – this condition carried on for about four months prior to the monsoon.
3. Over the years, there has been less amount of dal (lentils) in the food, as farmers have stopped/reduced growing it in the fields.
4. Vegetable and fruit intake was very low during the summer months.
5. With the lack of agricultural production, women labourers in the farms got less money/ grains, which had an impact on the nutrition levels in the families.
6. Thirty percent of households were severely food insecure.
7. 21.1 percent of children were severely stunted.
8. Combined GAM prevalence was 34.1 percent.
9. 18.3 percent of children were stunted and wasted.

3. Education

1. In Adhaura block, children were being taken out of school to collect *mahuwa* (*Madhuca longifolia* or butter tree). The women also pick up *mahuwa*, the flower with which they make liquor, from the forests; it is the main source of income for families.
2. In Gurua, stress increased on hand pumps in schools, a source of water for the community, hampering the children's access.

4. Protection

1. There was an increase in the numbers of adolescent boys migrating (and dropping out of school) for work with their male relatives.
2. Adolescent girls had also started accompanying their mothers and others for agricultural labour work.
3. Livelihood and Migration
4. In Adhaura block, there was a shift from agriculture to forest products.

5. Seasonal migration was very high.
6. MGNREGA jobs were providing a buffer, as rates and timeliness of payment is better when they migrate
7. There was an increase in cases of adolescent boys accompanying male relatives for work in Purnia.
8. There had been no rabi crop for the past two-three years in Gurua block.

KEY RECOMMENDATIONS

1. Rainwater harvesting at the household and community level should be promoted to conserve and reuse rainwater.
2. Drought resistant seeds and coarse grains should be promoted, which provide better nutrition and reduce water consumption.
3. Watershed development and revival of traditional irrigation systems should be promoted to improve resilience during drought-like situation.
4. Provisions should be made to increase the amounts of food grain provided through PDS to each family during water scarcity and drought.
5. Health care facility contingency plans should be made to ensure that service delivery during water stress periods continue regardless.
6. Plantation initiatives and greening projects around school premises could also be promoted to raise awareness on climate change and drought-related issues.

4.3 Madhya Pradesh

KEY FINDINGS (Shivpuri, Sagar, Rewa and Chhattarpur districts)

1. WASH

1. The fetching time for water for women was between one to five hours, increasing their work burden.
2. Conflict over water was reported in two villages.
3. About 80-90 percent hand pumps and wells were not functional due to technical faults as well as groundwater depletion.
4. MHM was being affected in all the villages as sanitary cloths that cannot be washed and re-used, were being used by women.

2. Food Security and Nutrition

1. Forty-four undernourished and 26 severely malnourished children were recorded in 16 villages
2. AWCs indicated 15 low birth weight and 16 high risk mother cases in 16 villages.
3. Anganwadi water sources were not functional – they were managing to get water from nearby water sources to prepare meals. One of the NRC functions was disrupted due to scarcity of water for about a week

3. Education

1. There was an approximately 10-15 percent drop in attendance as children accompanied their migrating parents.

2. About 60-80 percent hand pumps dried up in schools.
3. Use of toilets in schools and hand washing had reduced significantly due to scarcity of water.
4. The mid-day meal continuity in schools (even when the schools were closed) was the only respite for the communities. The government played a critical role in carrying out this role and during the FGDs, as well as interaction with the children themselves, this was a highlighted and appreciated feature.

4. Health

1. Hand pumps at most health facilities had dried up.
2. The sanitation and hygiene practices were affected at majority of health facilities and other linked services like NRC in all four districts.
3. Health facilities were being managed by fetching water from nearby sources, while some cluster health centres at block level were getting water through tankers
4. In Chhatarpur and Rewa districts during the women Focus Group Discussions (FGDs), members stated that PHC functions had been hampered to the extent that for conducting deliveries the staff asked the attendants to fetch two buckets of water on their own; this was later validated by the area nurse as well.
5. Despite the scarcity of water in the entire sample area, there was no record of any outbreak or escalation in water borne diseases, like diarrhoea, jaundice, malaria, etc. However, a few cases of skin rashes were seen in two villages.

5. Livelihood and Migration

1. Cropping pattern had changed due to rainfall variability and the loss of interest by farmers in cash crops.
2. There was increased migration of farmers and labourers to big cities.
3. There were livestock deaths due to thirst and starvation.
4. There was an approximately 50 percent decrease in the income of women engaged in *beedi* rolling (thin, Indian cigarette filled with tobacco flake and wrapped in a *tendu* or possibly even *Piliostigma racemosum* leaf tied with a string at one end) due to lack of a feasible alternative.

6. Protection

1. Assessing the impact of drought on issues of child protection was particularly challenging as the answer to most questions asked was a blanket "no"?

7. Governance

1. Disaster Management plans were in place at different levels, but drought-specific action plan, awareness and implementation was not visible.
2. The PDS system was functional but there were issues related to quantity and quality, and there were no specific provisions keeping in view the drought conditions, especially for the vulnerable.
3. The MGNREGA scheme was in place –the number of days for work had increased from 100 to150 days as per a Central Government circular, but there were implementation issues.
4. Accessing social protection schemes like old age pension was a challenge for the elderly.

KEY RECOMMENDATIONS

1. Strategies for addressing mitigation need to be developed for all levels, with significant emphasis on drought.
2. Women-centric work under MNREGA, especially around water conservation, would ensure women's access and control over natural resources.
3. Initiate decentralised systems for monitoring ground water levels and quality. Prepare water safety/security plans along with the community and existing WATSAN Committees
4. Develop alternative water sources/supply and storage capacity in health facilities, NRCs, AWCs to maintain quality service delivery.

4.4 Chhattisgarh

KEY FINDINGS (Rajnandgaon, Koriya and Bastar districts)

1. Water Sanitation and Hygiene

1. Most of the villages have hand pumps as the main source of drinking water. These hand pumps had been affected due to the receding water table in the region. In the last five months (up to June 2016) water levels declined 30 percent to 35 percent (from approximately 300 ft. to 450 ft.), rendering 40 percent of the hand pumps either with no water or able to pump out only a few buckets in a day.
2. Distance, queuing and fetching time had increased (30min-3hrs per day), almost six-fold.
3. In some villages, for the first time in decades that the 'natural springs' (*jharias*) that feed the local streams had dried up completely.
4. There was increased concentration of iron, arsenic and fluoride in drinking water.
5. MHM is became increasingly difficult. It is considered a taboo here to access the hand pumps during menstruation days.
6. Drought is acting as a deterrent for first time toilet users in the state.

2. Food Security and Nutrition

1. Dependence on PDS has increased as prices in the market have risen due to the demand
2. Protein consumption had gone down. Earlier, people were getting Bengal Gram, which is a rich source of protein, through the PDS System. This has completely stopped.
3. 7.6 percent of households were severely food insecure.
4. 16.1 percent of children were severely stunted.
5. Combined GAM prevalence was 25.8 percent.
6. 13.7 percent of children were stunted and wasted.

3. Education

1. Hand pumps in schools have dried up and students had to bring their own water to school.
2. It was observed that the prescribed diet of MDM was not being followed. Mere rice and watery dal were being served.

3. Across the three districts, around 80 percent enrolment in schools was observed, which is a healthy number.
4. With fewer hand pumps working in the villages, water fetching became a time-consuming activity in the morning. Due to this, children (especially girls) miss school many times.
5. In most of the schools visited, availability of drinking water as well as water in toilets was found to be insufficient.

4. Protection

1. Some children, especially girls, were missing school to collect water.

5. Health

1. In PHCs, people were told to fetch their own water from the nearby hand pumps.
2. Health services of every kind affected due to drought-like situation – institutional deliveries, outpatient visits, in-hospital care, to name a few.

6. Livelihood and Migration

1. Agricultural Yield had reduced by 50 percent to 70 percent.
2. Reduced collection of *tendu* (Asian ebony tree, which is a cheap substitute for tobacco) leaves by 66 percent and *mahuwa* by 80 percent was reported during the study. Even horticultural plants like mangoes have suffered this year due to the drought-like situation.
3. Distress selling of livestock was also observed.
4. For the first time in their lives women from the households had accompanied men migrating for work.

KEY RECOMMENDATIONS

1. *Sokhta* pits (soak pits) should be made compulsory with every hand pump (innovative solutions for how they work in black soil should be explored).
2. Drought sensitization programs to be held in PHCs, Anganwadis and even schools.
3. Make drought governance conflict-sensitive.
4. Community participation in drought responses should be integrated in the planning.
5. More decentralized processes need to take shape to build capacities at the grassroots.
6. Study on traditional water harvesting practices and revival of suitable ones needs to be done. Forest drought needs a thorough study and its impacts must be properly documented. In fact, the drought relief should also include providing support to forest produce gatherers.

4.5 Telangana

KEY FINDINGS (from Mahabubnagar and Medak districts)

1. WASH

1. The ground water level varies from 10 meters onwards to 60 meters. In worst cases, the ground water also carries contaminants like salinity, fluoride, iron and nitrate.

2. Time taken to collect water has increased from 15 minutes to over two hours, increasing the work burden on women.
3. Inequitable distribution of tanker water has also increased the risk for women and the elderly.
4. Water markets have sprouted up with rates between ₹ 60-80 ₹ for 20 litres of water.
5. Hand washing and MHM practices had been hampered.
6. Household toilets were not being used in 22 percent of households that had toilets, primarily due to lack of water.
7. Ninety-five percent of households surveyed practised open defecation. Food Security and Nutrition
8. 7.5 percent of households were severely food insecure.
9. 12.3 percent of children were severely stunted.
10. Combined GAM prevalence was 21.4 percent.
11. Percent of children were stunted and wasted was 9.6
12. Milk and fish had either completely vanished from or reduced in household diets.

2. Protection

1. Parents were migrating for work, leave behind their children, of whom girls were often taken out of schools to look after household chores.
2. Cases of child marriage and trafficking had increased due the distressed conditions of the community.
3. Children were taking up petty jobs for a pittance in the absence of parents who had migrated.

3. Education

1. Absenteeism after the MDM had increased since children went with their parents for petty jobs to support the family.

4. Livelihood and Migration

1. Many adults migrated, leaving their children behind with infirm grand-parents.
2. Fisheries that were the main source of livelihood for 20 percent of the women folk had dried up, leading to further migration.
3. Cattle were being sold at distress rates or were left loose to wander due to lack of fodder and food.

5. Health

1. Cases of malaria and typhoid had increased in the past five months.
2. Cases of fluorosis – dental and skeletal – were visible.
3. Thirty-seven deaths were reported in Mahabubnagar due to heat waves.

KEY RECOMMENDATIONS

1. The mitigation measures undertaken by the government should be weaved into the action plan at the community level such that the sense of ownership and participation is developed. In the long run, the coping mechanism of the community will be developed to adapt to the climate variation.

2. There should be PHC-wise contingency plans to ensure presence of staff and availability of necessary supplies during the scarcity period.
3. A reinforcing mechanism to ensure delivery of essential nutrition support during the scarcity period should be developed.
4. Implement water safety plans at schools to enable students to understand the risk to water sustainability in the long run.

4.6 Rajasthan

KEY FINDINGS (from Jalore and Udaipur districts)

1. WASH

1. People were dependent on tanker services in the Udaipur blocks; if tankers did not reach, then women had to collect water from private wells at 3 km.
2. During shortage of water, people purchased water from private tankers of 2000 to 3000 litres capacity, for which they paid Rs.300 to 500.
3. Most tube wells in the villages have become dry during the summer.
4. There was no quality testing of the tanker water being supplied.
5. Salinity, nitrate and fluoride content were high in groundwater.

2. Food Security and Nutrition

1. 16.7 percent of households were severely food insecure.
2. 17.1 percent of children were severely stunted.
3. Combined GAM prevalence was 38.1 percent.
4. 18.8 percent of children were stunted and wasted.
5. The Government of Rajasthan has issued an order to provide meals every day to children in schools, and to continue MDM during the summer vacation. It was observed, in both the districts, that MDM was arranged only for few days but not regularly.

3. Protection

1. The impact of drought-like conditions was not seen on child protection issues but given the high inherent vulnerability of children, drought was exacerbating the situation.

4. Health

1. No epidemics of waterborne diseases were reported in Udaipur and Jalore districts.
2. Water related diseases like fluorosis were a major problem due to contaminated groundwater supplies.
3. Essential and emergency health services were not disrupted despite water shortage; tanker water supply was available during the water crisis.

5. Education

1. There was enough water in the schools of Sanchore and Chitalwan blocks of Jalore district. In Lasadiya block of Udaipur, school toilets were not in use; shortage of water was the main reason.

6. Livelihood and Migration

1. Due to erratic rainfall and sudden flash floods in Jalore, and hailstorm in Udaipur, almost all farmers lost their standing crops.
2. As per household interviews, there was a 6.25 percent increase in migration this year due to loss of crop.

KEY RECOMMENDATIONS

1. Strengthen Gram Panchayats to manage village water supply schemes.
2. Form Water Users' Associations at the community level and aid initiate, plan and execute water related solutions.
3. Calculate water budget for every reservoir covering drinking water, domestic consumption, *kharif*/*rabi* crop requirements, livestock requirements, and seepage and evaporation losses.
4. A monitoring mechanism should be established for checking quality of water supplied by tankers – both government and private.
5. Capacity building for protection risk identification, regarding drought and drought-like situation, needs to be incorporated.

4.7 Jharkhand

KEY FINDINGS (Palamu, Garhwa, Ranchi, West Singbhum districts)

1. WASH

1. Ponds, lakes, springs (traditionally used for bathing and washing) had dried up.
2. Hand pumps were the only source of water in villages; many were drying up/ dysfunctional (both because of faulty pipes as well decrease in groundwater levels).
3. Secondary contamination risk was high due to poor storage and collection practices.
4. Toilets (where constructed) were not being used due to lack of water.
5. Women were using dirty water to wash sanitary cloths and only washing them after dark.

2. Food Security and Nutrition

1. Food shortages resulted in many women skipping meals.
2. The average quantity of food grains kept for household consumption reduced to more than half.
3. Family food baskets had reduced.
4. People in Palamu District, especially the Pahariya community, were found to be eating only rice with salt and skipping their meals.

3. Protection

1. It has been reported that in extreme drought conditions, when families migrate, children do become more vulnerable.

4. Health

1. Diarrhoea outbreak was reported in May (2014/15); the seasonal diarrhoeal outbreak was seen to have changed from monsoon to summer time.

2. In West Singbhum, there was a substantial increase in the numbers of typhoid, worm infection, and skin diseases (like scabies and chicken pox) cases. In West Singbhum, there was a significant variation in the Low Birth Weight cases during the reference period. Earlier, there were four cases, which had increased to 13.
3. Palamu Hospital did not have a 24-hour water supply.
4. At the Garhwa block CHC, no patients were being admitted because of a lack of water.

5. Education

1. Schemes like MDM were successful in retaining children in schools. The flexibility given to the schools to change the schedules for vacation helped in coping with the heat wave and drought. Implementation of some of the programs such as summer school may have minimized the impact of drought on education, specifically the dropout rate and overall development of children in the affected areas.

6. Livelihood and Migration

1. Out of the total 212 blocks, crop damage in 64 blocks was more than 50 percent. Farmers in Palamu reported that there was 100 percent crop failure in the previous year (2015-16).
2. There was a 40-50 percent decrease in milk production.
3. Migration increased due to the cumulative impact of years of drought. People from higher socio-economic backgrounds have also started migrating for work.

KEY RECOMMENDATIONS

1. A better understanding of the geomorphology, geology, hydrogeology and natural resource base necessary implement soil and moisture conservation works. A ridge to valley treatment approach is suggested.
2. Clear policies need to be put in place for sustainable water management and conservation of water resources. Both drilling and quantum of sourcing need to be monitored.
3. A Drought Response Manual should be developed for the state, with detailed guidelines on decentralized management.
4. During the period of drought all the families could be considered for Public Distributions System

4.8 Odisha

KEY FINDINGS (from Boudh and Gajapati districts)

1. WASH

1. Time to fetch water, for women as well as children, increased by almost 300 to 500 percent in many cases. Pregnant women and children had also been engaged in fetching water from hand pumps.
2. Water scarcity affected the implementation of some government schemes, such as Indira Awas Yojana (IAY) and other construction related works.
3. Women and adolescent girls faced problems in maintaining their personal hygiene as they used muddy water from the tube well or pond water during drought.

2. Food Security and Nutrition

1. The PDS rice could meet people's food requirements for only about a week. For the rest of the month they had to depend on the market.
2. Dal had almost vanished from most of the households, vegetables were a rare delicacy (both for unavailability and affordability) and meat/eggs etc., were kept for guests or for special occasions only.
3. The drought in the forest had also affected the intake of green leaf and forest fruits.
4. Most families had a stock of rice that would meet their needs for about a week only.
5. Compared to 2014, 55 percent increase in Nutrition Rehabilitation Centre (NRC) admission was seen in 2015 for the month of March, April and May 2016 in Gajapati district.

3. Health

1. Women suffered mostly from white discharge, anaemia, and fever/head reeling/ vomiting (heat stroke) due to excessive heat. Lack of availability of water was reported in health facilities; however, the staff ensured that delivery of health care services was not hampered.

4. Protection

1. Boys and girls above the age of 10 all worked and their work burdens had increased.
2. Most of the families migrated to big cities in search of work, leaving behind their children, including young girls, to take care of the house and younger siblings.

5. Livelihood and Migration

1. The number of people migrating out due to drought had increased or were migrating for more months (seasonal migrants) than before. Girls had also started migrating out from 2015 onwards.
2. The crop loss reported for the paddy crop during the *kharif* season varied from 50 percent to 75 percent in the villages visited
3. In both the districts there was a drastic reduction in collection of Non-Timber Forest Produces.

6. Education

1. The MDM scheme was non-functional during the three-month summer vacation in 2015.
2. Girls especially ended up missing school as they had to travel long distances and wait longer hours for collecting water.

KEY RECOMMENDATIONS

1. Water security plans for each watershed of the state need to be developed. Water harvesting and recharging through integration of traditional knowledge and practices need to improve.
2. Increased emphasis on climate resilient cropping patterns and diversity.
3. Drawn up water security plans for each PHC/CHC. Integrate alternate energy, water harvesting and recharge.
4. Ensured and enhanced price for NTFP during drought years may also help.
5. Considered expansion of food security programmes drought times. More entitlements for vulnerable groups could be provided.

ANNEXURE 4:

SUPREME COURT OF INDIA ORDERS ON DROUGHT, MAY 12, 2016:

Subject	Order
Declaration of Drought	While revising, and updating the Manual, the Ministry of Agriculture in the Union of India should take into consideration the following factors apart from others: • Weightage to be given to each of the four key indicators should be determined to the extent possible. Although the Manual states that rainfall deficit is the most important indicator, state governments seem to be giving greater weightage to the area of crop sown out of the cultivable area and not to rainfall deficit. For this reason, necessary weightage is required to be given to each key indicator. • The time limit for declaring a drought should be mandated in the Manual. • The revised and updated Manual should liberally delineate the possible factors to be taken into consideration for declaration of a drought and their respective weightage. • The nomenclature should be standardized as also the methodology to be taken into consideration for declaring a drought or not declaring a drought
Drought Manual	The Drought Management Manual is undoubtedly a meaningful and well-researched document. However, the court believed since the Manual was published in 2009, several new developments have taken place and there is a need to revise the contents of the Manual. The court directed that the Manual be revised and updated on or before December 31, 2016. In the proposed revised and updated Manual, as well as in the National Plan, the Union of India must provide for the future in terms of prevention, preparedness and mitigation. Innovative methods of water conservation, saving and utilization (including groundwater) should be seriously considered and the experts in the field should be associated in the exercise. Illustratively, dry land farming, water harvesting, drip irrigation, etc., could be considered amongst other techniques. Humanitarian factors such as migrations from affected areas, suicides, extreme distress, the plight of women and children, are some of the factors that ought to be kept in mind by state governments in matters pertaining to drought and the Government of India in updating and revising the Manual.
Disaster Mitigation Fund	As mandated by Section 47 of the Disaster Management Act, 2005, a National Disaster Mitigation Fund is required to be established.
Disaster Response Force	As mandated by Section 44 of the Disaster Management Act, 2005, a National Disaster Response Force with its own regular specialist cadre is required to be constituted. Train the National Disaster Response Force and equip it to tackle the drought-like situation.

Subject	Order
National Food Security Act (NFSA)	The court instructed state governments to guarantee monthly food grain entitlements to all households (regardless of whether households fall under the category of priority or not) as per the National Food Security Act. It also waives off the requirement of possessing a ration card to get monthly entitlement of food grains under NFSA. Rather, any appropriate identification and proof of residence can substitute the ration card to access food grains.
Mid-Day Meals	On the Mid-Day Meal Scheme, the Court directed the states to extend the Mid-Day Meal Scheme for the benefit of children during the summer vacation period in schools within a week from the issuance of direction, that is, May 13. The Court directed states to make provisions for the supply of eggs or milk or any other nutritional substitute, preferably five days in a week or at least three days in a week.
NREGA	1. The Government of India is directed to release to the state governments adequate funds under the scheme in a timely manner so that the 'workforce' is paid its wages well in time. 2. The Government of India is directed to ensure that compensation for delayed payment is made over to the workers whose wages have been delayed beyond 15 days, as postulated by paragraph 29 of Schedule II of the NREG Act and the Guidelines for Compensation formulated pursuant thereto. 3. Since the NREG Act is a social welfare and social justice legislation the Government of India must ensure that its provisions are faithfully implemented by all concerned.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