

PERSPECTIVE 01



DROUGHT AND DRINKING WATER CRISIS IN BUNDELKHAND

HALF FULL HALF EMPTY

Drought swept Bundelkhand desperately needs a drinking water secured future. It can only happen when government and communities converge their experiences and efforts seamlessly.



The Water and Sanitation Perspective series disseminates issues and experiences in India's water and sanitation sector. It is an outcome of WaterAid India's programme and policy work

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Others who made it possible

This edition of WATSAN Perspective series owes its existence to many. To begin with, WaterAid India acknowledges the critical helps of Parmarth. The report benefits a lot from the sensible reportage of the media team that visited Bundelkhand during mid-June 2008 at the invitation of WaterAid. Parhit and our other partners in the region as well as our staff helped us in understanding community efforts in fighting the drinking water crisis.

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Acknowledgement

We cherish the resilience of numerous communities that have been putting up a brave front to the five-year long drought in Bundelkhand.

That is the inspiration for this paper. We sincerely thank the communities for the time they spared for us. The paper draws extensively from experiences of our partners in the region.

Foreword

In a diverse country like India, assuring adequate, safe and sustainable drinking water and sanitation to all is a challenge. It is also a basic human right; fundamental to socioeconomic development.

Although Gandhiji said “sanitation is more important than independence”, it has taken some time for sanitation to gain equal importance to water in the Indian development agenda. In recent times, there has been catching up in terms of understanding of issues, policy development and allocation of resources. We still have a long way to go – the need for sanitation and hygiene has become pressing in the urban areas now.

WaterAid endeavours to bring our grassroots experiences and research work to the notice of policy makers, and thus suitably influence the development agenda. The *Perspective Series* is one such effort.

The *Perspective Series* aims to capture the experiences of WaterAid India and its partners in their work on water and sanitation. This issue of *Perspective* focuses on the consecutive five years of drought in the Bundelkhand region of India, and the resultant impact on drinking water availability. Documenting the resilience of some communities, it analyses the root causes for such a scarcity of water. Through this, we hope to stimulate thinking and action so that at least drinking water is available during drought.

Dr Isha Prasad Bhagwat
Director Programme Operations and Acting Country Representative
WaterAid India
September 2008

The drought spell since 2003 has led to severe drinking water crisis in Bundelkhand. It is an unlikely situation given the region was well equipped to manage its domestic and irrigation water demands till a few years ago





Pre TEXT

Watered down

Ecological degradation and faulty policies make drinking water scarce and less accessible

A severe drought has been sweeping the Bundelkhand region since 2003. It has let loose a severe livelihood crisis. Loss of agriculture is a major issue of concern. However, the issue of availability of drinking water has not got the emphasis it should have.

Various field reports suggest that the crisis of drinking water is unprecedented while the provisions for it are much less than expected. The current drought spell is so intense, as many local residents say, that for the first time in recent past drinking water sources have dried up. The dominant sources of drinking water - dug wells and masonry wells - have been badly impacted. On the other hand less surface water led to depletion in groundwater due to less recharge. This has left thousands of handpumps defunct. In a situation of overall water scarcity, and particularly when drinking water is a problem, sanitation has suffered. This has further added to people's woes in terms of bad health.

For the economically weaker and the Scheduled Castes and Scheduled Tribe population, drinking water problem is more pronounced. This is because their access is being curtailed based on social discrimination. In the current scarcity scenario, they suffered the most. This year monsoon has arrived with a bang evoking hopes that it would heal the region's water problems. Till July 20 this year the region received around 50 percent of its annual rainfall; in the second week of June alone the region received around 30 percent of its total rainfall. This triggered floods and widespread losses in livestock and property. It brought in fresh troubles for the region – contaminated drinking water. Add to it, the overall capacity of the region in harvesting and storing rainwater for use later has been substantially reduced. Thus the bounty rainfall will not make much impact on the overall water availability.

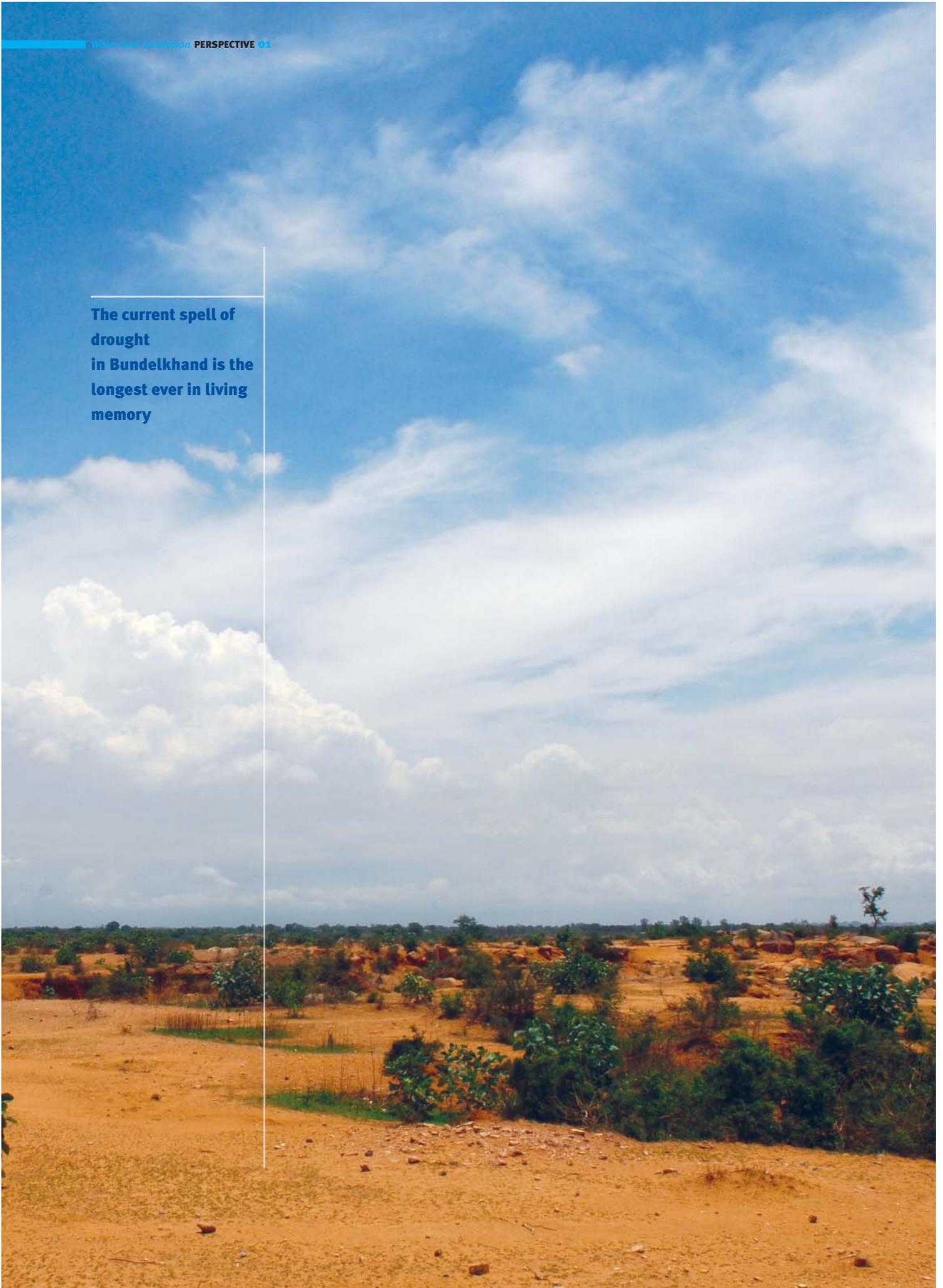
As early as 1970s Bundelkhand was meeting its domestic and irrigation water demands through traditional methods of water harvesting despite being drought prone. It was a fragile ecological equation where the forests helped recharging and regulating rainwater flow and the vast network of tanks and ponds captured water for use during leaner period. The ponds and tanks also worked as recharge pits. Local communities managed the water sources thus making them equitable and sustainable.

But deforestation clubbed with neglect of the traditional systems of water harvesting has distorted the equation. Now Bundelkhand conserves less rainwater than earlier. The results are there to see. First, the overall irrigation water availability came down. Secondly, the availability of drinking water has been impacted. Over a period of time, this has resulted in less recharge of groundwater as the main sources of recharging like tanks, ponds and the forests have vanished. This has left thousands of hand pumps defunct. It has made the region more vulnerable to drought – without the capacity to conserve water even a small deviation in rainfall causes drought. The current impasse is an outcome of this cycle of ecological degradation. On the other hand the government encourages water-intensive cropping system that has facilitated the region's slip into a water scarce situation.

This paper is a situational analysis of the crisis and challenges of drinking water in Bundelkhand in the overall context of current drought spell. The paper makes a case for giving the issue of drinking water utmost priority in the mainstream agenda of drought management. The paper argues that community managed drinking water system is the need of the hour. ■

For the economically weaker and the Scheduled Castes and Scheduled Tribe population, drinking water problem is more pronounced

The current spell of drought in Bundelkhand is the longest ever in living memory





Farms of despair

The current drought in Bundelkhand impacted 16 million people; 40 percent farms were not sown bringing down food production by 30 percent while 70 percent of ponds and tanks dried up

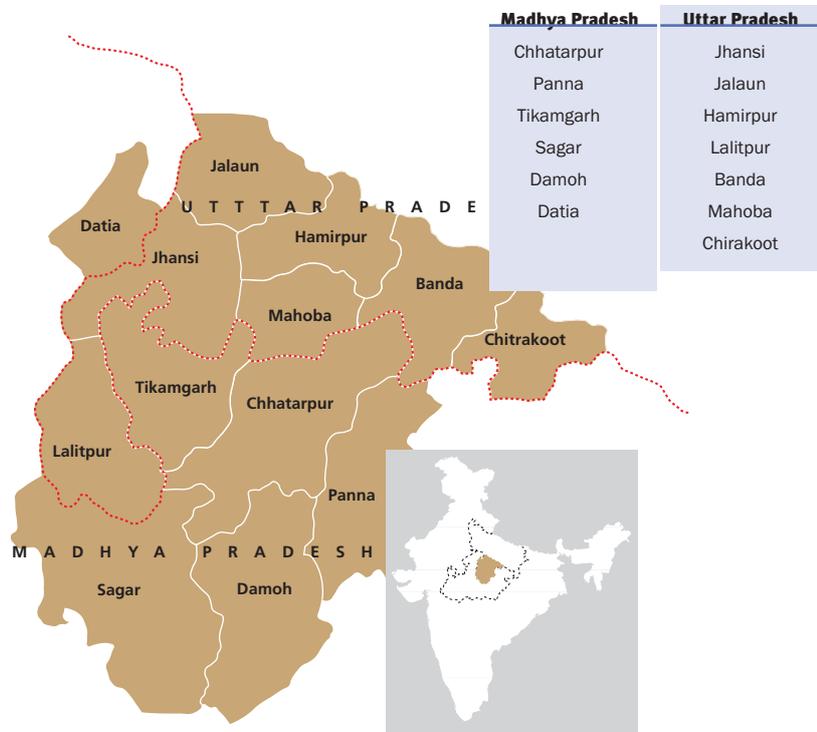
The Bundelkhand region – approximately an area of 70,000 square kilometers with 21 million people, nearly the size and population of Sri Lanka, comprising 13 districts of Madhya Pradesh (MP) and Uttar Pradesh (UP) – is facing its worst ever drought spell in living memory . Rainfall has been deficient by 40-50 percent for the last five years across the districts (See table: Deficit rainfall across Bundelkhand, p10).

Going by the report of an inter-ministerial central team, headed by JS Samra of National Rainfed Areas Authority, the region didn't sow in 40 percent of farms; foodgrain production was down by around 30 percent. More than 20 lakh livestock were abandoned, a major source of livelihood (See box: livestock losing lives, p12) for local communities. Around 40 percent of the region's population migrated out, doubled since 2003.

Geography of poverty

The 13 districts of Bundelkhand feature in the Planning Commission of India's 200 most backward districts list. Eighty percent people depend on agriculture and livestock rearing

Lack of drinking water is a major reason for out migration from the region



Deficit rainfall across Bundelkhand during 2004-2008

In the last four years rainfall across Bundelkhand has been deficient. In 2007-08 the deficit is at an average 50 percent with six districts reporting over 60 percent deficit in

Districts	Normal rainfall (mm)	rainfall			
		2004-05	2005-06	2006-07	2007-08
		Deviation in %			
Uttar Pradesh					
Lalitpur	879	-19	-34	-54	-40
Jhansi	880	-39	-24	-52	-61
Jalaun	787	-23	-24	-52	-61
Hamirpur	851	-30	-37	-51	-50
Banda	851	-30	2	-52	-57
Chitrakoot	945	-14	-8	-22	-60
Mahoba	940	-19	-40	-21	-66
Madhya Pradesh					
Chhatarpur	984.8	-10	-9	-44	-54
Tikamgarh	971.5	-46	-28	-43	-64
Damoh	1065.4	-9	53	-27	-22
Sagar	1086.7	-34	-29	-47	-34
Datia	767.8	-34	-29	-47	-34
Panna	1069.6	12	33	-46	-67

Source: Report on Drought Mitigation Strategy for Bundelkhand region of UP and MP (unpublished), Inter-ministerial Central Team, Delhi, May 2008

The current drought relief programmes are bigger than that of 1987 drought both in scope and size

Food production dips

The drought brought down overall food production drastically in the MP side of the region. According to the MP Right to Food Campaign and the MP Apda Niwaran Manch, coalitions of civil society groups working in the region, the MP side of Bundelkhand reported nearly 45 percent dip in foodgrain production during 2003-07 (See table: Agriculture: A hopeless proposition). In 2003-04 Bundelkhand region produced 2.45 million tonnes of foodgrain which came down to 1.13 million tonnes in 2006-07. The decline in production of all grains during this period was around 43 percent. The production capacity has come down from 1,035 kilograms (kgs) per hectare (Ha) in 2003 to 806 kgs/Ha in 2007.

The region (MP side) recorded lowest ever wheat production, a major source of livelihood as well as a staple foodgrain. In 2000 the region contributed 14.35 percent wheat production of the state. It is now around 7 percent. Though wheat production is declining in the state in the last eight to nine years, the decline in Bundelkhand region is sharper – production declined by 16 percent in MP and by 58 percent in Bundelkhand.

The region is rainfed and the major source of domestic and irrigation water is the well. The state water resources department data shows that 65

Agriculture: A hopeless proposition

The Bundelkhand area in MP is reporting more than double foodgrain production decline in comparison to the state figure. What is worrisome is the drop in yield; it is around four times that of the state

District	Decline in foodgrain production (in percentage)	Reduction in yield (in percentage)
Chhatarpur	58.06	35.34
Tikamgarh	76.81	48.48
Panna	28.02	10.41
Sagar	30.75	2.58
Damoh	15.94	10.51
Datia	44.18	18.31
Bundelkhand	44.67	22.13
Madhya Pradesh	13.86	6.41

Source: MP Right to Food Campaign, May 2008, Bhopal

The much awaited central agriculture ministry's relief package doesn't mention drinking water as a key concern

50:50: hope and despair

In UP farmers in Bundelkhand have lost 50 percent of their agriculture

District	Cultivation (in Ha)	Crops lost (in Ha)	Not sown areas (in Ha)
Banda	10,771	2,412	3,170
Lalitpur	8915	2894	2071
Chitrakoot	4341	1799	1522
Chattarpur	53	184	2541
Hamirpur	4096	12,815	26,197
Jalaun	4996	1013	183
Jhansi	42,154	13,080	6,660
Total	75,326	31,303	41,344

Source: Parmarth Samaj Sevi Sanstha, Orai, Jalaun, UP

percent of households in Tikamgarh, 61 percent in Chhatarpur district and 44 percent in Panna district depend on wells for irrigation. Most of these wells dried up in the last five years of drought. Going by the Central Ground Water Board, water in around 40 percent wells of Tikamgarh dropped further while water in 8.86 percent wells slipped more than four metres of the level in 1997.

A survey of 132 villages in the seven districts by the Jalaun based Parmarth Samaj Sevi Sanstha points at widespread loss of crops due to drought. What is startling is that many farmers in these villages have not been able to take up sowing at all. The total areas cultivated were almost

(Un)Package

Everybody waits for the union government to declare the promised development package

The Union government is yet to declare a Rs. 8,000 crore relief package for Bundelkhand areas (See accompanying table). The package follows the high level inter-ministerial central team report headed by JS Samra, head of the National Rainfed Development Authority. Both the state governments demanded for Rs. 88,883 crore for fighting the drought spell – UP asked for Rs. 80,000 crore (including other districts in the state) and MP asked for Rs. 1,883 crore (for only direct drought relief). Interestingly, the report has not mentioned drinking water specifically for once in its report. It is assumed that the provision for water conservation includes programmes for drinking water. The report has recommended Rs. 400 crore for building 40,000 new dug wells within the water conservation component. This could be inferred as a provision linked to drinking water.

A cursory look at the details of the package shows that Union government has included existing programmes and commitments into the package. For example, the debt relief for farmers would be covered under the recently declared debt waiver for small farmers in the budget. In 2008-09 budget the central government declared loan waiver for small farmers.

It has been more than six months since the Union government declared the setting up of the team. In April the Union agriculture minister Sharad Pawar declared that within a month the package would be officially declared. In May the team submitted its report. According to sources in the agriculture ministry the government is still indecisive over the recommendation.

Sector	UP (in Rs. Crore)	MP (In Rs. Crore)
Water conservation	1500	1500
Agriculture	1000	900
Irrigation	650	1200
Debt waiver	450	600
Livestock development	175	150
Forest	75	250

Crone = 10 million

Source: Inter-ministerial central team report, June 2008 New Delhi

equal to what farmers lost and not sown (See table: 50:50, hope and despair, p11).

There is undivided political, and policy, attention on the region and its crisis. Going by the state governments' records, the current drought relief programmes are bigger than the 1987 drought crisis in scope and size. Both the states have already spent close to Rs. 2,000 crore in the last five years in drought relief. Both the states have declared special development packages for the region while the Union government set up an inter-ministerial team to study the drought situation (See box: (Un)Package, p11). The MP government has declared setting up a Bundelkhand Development Authority for targeted development of the region.

One monsoon is not enough

Since June 11, the monsoon has been active in region pouring down close to 50 percent of the annual rainfall in just few weeks. Local people, including few meteorological department officials, term the rainfall as 'unusual' (See box: *Is climate changing in Bundelkhand?*). Normal rainfall for Jhansi for the period June 1-11 is 8.9 mm but it got three times more than this during the same time. Hamirpur district in UP got more than 12 times more rain during this period than the average – its normal rainfall for this period is 5.6 mm while it got 68 mm. Citing meteorological department sources media has reported that in UP side of Bundelkhand the average per district rainfall from June 1-19 was between 300 to 1900 percent above normal for this period. However, by the last week of June this had already come down to 200 to 1300 percent. There are already spells of flood in Sagar, Damoh and Tikamgarh districts and state government has switched from drought relief to flood relief. The heavy bouts of monsoon have already washed away many water harvesting structures created under the National Rural Employment Guarantee Act (NREGA).

Did the bounty monsoon ease away the crisis in Bundelkhand? Both yes and no, as residents swung between hope and despair. Hope, because a normal monsoon temporarily doused the crisis. Despair, because the economic impacts of the drought spell are so high that recovery may take few more years and few more normal monsoons that the local residents hesitate to hope for. "The situation is so bad that it may take four-five years to recover presuming normal rainfall," cautions the inter-ministerial central team report.

The monsoon has brought in an immediate food crisis. Already suffering from long agricultural loss and without any food stock, the farmers of Bundelkhand have to face the leanest food security period, the four months of monsoon. Add to this the problems of contaminated drinking water and sanitation. In many flooded villages in Tikamgarh and

“Fifty millimeters of rainfall is enough to have year round drinking water for a village of 1,500 people”

Livestock losing lives

One of the most distressing aspects of the recent drought situation in Bundelkhand region has been that thousands of farm animals - including cows, bullocks, buffaloes, goats and sheep - have died due to shortage of water and fodder. Cows are the worst affected. In Mastapur village (located in Jatara block of Tikamgarh district) villagers said in a group meeting that compared to the situation about 7 years back (before the drought) only about 20% of animals were with the villagers. In Barethi village of this district people said only about 33% animals were with them compared to the situation about 7 years back. In Basadgunva village (located in Baar block in Lalitpur district), villagers said only about 30% of their animals remained with them, compared to pre-drought situation. In Chaglauwa village of the same block villagers said that they had only 40 percent of the animals compared to the pre-drought situation. Villagers said that fodder's prices had gone up to Rs.150-300 a quintal, so they couldn't afford to feed their cattle.

Bharat Dogra for WaterAid India, May 2008

Erratic weather conditions and absence of water harvesting mechanism make the drinking water situation worse

Is climate changing in Bundelkhand?

Bundelkhand is witnessing contrasting weather conditions – long drought spell and intense monsoon rainfall. The recent long drought followed by extreme rainfalls in the current monsoon season is an example. Although most recent discussions on Bundelkhand have taken place in the context of the five-year-old drought, the fact is that even earlier there were complaints of extreme weather resulting in serious disaster situations and tragedies.

The warning came a decade ago. A report prepared by the Centre for Rural Development and Technology, IIT, Delhi and Vigyan Shikshan Kendra, U.P. found that during 1978-1998: "The years 1978, 1980, 1982, 1984, 1986, 1992 to 1995 have been more problematic from the view point of floods, while the years 1978 to 1980, 1984, 1986, 1990 and 1993-1995 have been marked by droughts when more than four districts of the region were affected by the calamity. The elderly people are emphatic that such frequency of floods and droughts was not seen during their childhood." This report also points out that in the summer of 1995, day temperature during May-June shot up to 52 degree Centigrade in Banda district, resulting in hundreds of deaths within 24 hours of 14-15 June.

Local residents have told WaterAid India during numerous field visits and interaction that particularly in the last four to five years there have been significant changes in weather patterns which have adversely affected farmers and farming. Comparing the last four-five years with the situation 25 to 30 years earlier, people say that rainfall has decreased, the number of rainy days has decreased, rain tends to be concentrated in a smaller number of days, and cases of untimely rain are more common (frequently harming farmers instead of helping them). The damage caused by hailstorms, frost and storms has increased. This year in Jalaun a storm blew away the harvested wheat of several farmers.

Bharat Dogra for WaterAid India, July 2008

Mahoba, drinking water sources are still not potable as flood water entered them. "The rain has had immense positive psychological impact on the people who over the years have got used to seeing monsoon clouds pass Bundelkhand by," says Pushpendra of the Aapda Nivarak Manch in Banda, a civil society association working towards making the region drought free. However, he cautions, "I am uncertain whether the rain would be able to end the drought. Rain, if it is not in tandem with the agriculture schedule, would not only be useless but disastrous."

"The first showers should have been enough for ensuring drinking water in many villages. Our estimate shows that 50 mm of rainfall is enough to have year round drinking water for a village of 1,500 people provided there is a water conservation mechanism in place. So what matters now is whether we have that or not," says Mamta Jain of Upma Mahila Sanstha, an NGO that works in Tikamgarh district on water conservation. ■





Seventy percent of tanks and ponds, used for drinking water purposes, have dried up. Depletion of groundwater has left thousands of handpumps defunct



Watertight

The drought during 2003-08 dried out the traditional and masonry wells, primarily used for drinking water purpose. As handpumps also dried up, it led to unheard of drinking water crisis in the region

Most of the drinking water sources in the region dried during 2003-08. "Seventy percent of tanks and ponds have dried up and there is a steep fall in groundwater," assessed the inter-ministerial central team report.

According to various estimates, the 13 districts with around 16 million rural population were provided water through 5,000 tankers during May-June 2008 for domestic and drinking purposes. That was not sufficient – at an average one tanker for 3,200 people or 640 households. Village women scavenged every possible source for drinking water (See box: "We sleep for three hours", p16).

In Tikamgarh district, out of the 182 handpumps, 119 were defunct. The experience of Mahoba district explains the crisis of drinking water better. The district has 3,800 handpumps of which 2,800 were defunct. The district had groundwater at 40 feet below which a thick layer of granite exists. Now government is digging beyond this granite layer. "But these deep sources are linked to aquifers of Panna and Tikamgarh thus in future impacting their groundwater availability," points out Arvind Khare of Gramonnati Sansthan, an NGO based in Mahoba.

"Rapidly decreasing water table created a crisis of drinking water. In some of the areas the poor people face the crisis from February/March to end of June. Wells and handpumps dry out in the beginning of the summer or even before the end of the winter," says a report 'Drought and Livelihood in Bundelkhand' by Oxfam, Lucknow . The report estimates that drop in groundwater level rendered half of the handpumps installed in UP side of Bundelkhand defunct.

In most of the districts handpumps dried or yielded little water. It substantially increased the time spent by women to fetch water. Various anecdotal surveys by non-government organizations pointed at women spending at an average 4-5 hours a day to secure around 20 litres of drinking water. In MP side, government with the hope of navigating this desperate search had marked hand pumps with indicators like 'no water', 'less water' and 'available water'.

In Parmarth's survey of 131 villages in UP side of Bundelkhand, only seven percent of villages had drinking water availability throughout the year. More than 60 percent villages had drinking water for just one month and 31 percent villages had for two months (See table: Drops). That shows the intensity of drinking water crisis.

The scarcity of drinking water had immense health

Only seven percent of villages had year round drinking water availability, says a recent survey

Drops

Survey points out that 7 percent villages get year round drinking water access

District	Total surveyed villages	Water availability in villages		
		One month	Two months	Whole year
Banda	21	13	4	4
Lalitpur	21	3	15	3
Chhattarpur	6	3	3	NIL
Hamirpur	15	15	NIL	NIL
Jalaun	8	6	2	NIL
Chitrakoot	15	12	3	NIL
Jhansi	33	22	10	1
Total	119	74	37	8

Source: Parmarth Samaj Sevi Sanstha, Orai, Jalaun, UP

Household spending on water has gone up while women spend four to five hours a day for collecting water

“We sleep for three hours”

In the scorching heat of a May afternoon, about a dozen women are sitting near a hand pump in Lalitpur district's Chiglauwa village with their *gagris* (water pots). Their wait for water is proving to be a long one. The reason is that the hand pump stops yielding water after a few half-hearted gushes of water. A woman who is filling her 'gagri' has to then patiently wait for the hand pump to recoup and after perhaps half an hour yield some more water. This way it can take a woman two to three hours to fill her *gagri* and return home.

As Bhuvan, one of the women waiting her turn says, "Most of our time is spent in fetching water. We cannot go for any work, although work is badly needed as crops have failed in this terrible drought year."

Due to these long delays the work of fetching water continues almost all night. Several women say that they have been getting barely three hours' sleep during recent months of water shortage. Few villagers use tractors to bring water from a distance of 3 to 4 kms. from bore-wells while others try to bring water on bicycle.

Bharat Dogra for WaterAid India, May 2008

ramifications. With day time temperature hovering above 40 degree during March-August, water scarcity led to dehydration and diarrhoea. Lack of water also meant poor sanitation that further accentuated health problems. During field visits by WaterAid researchers to the region during May-June 2008, many villagers informed that scarcity of water had forced them to defecate in the open despite having toilets at homes.

The great escape

People had to spend much more than their overall earning for water (See box: *Poverty line: Rs. 360/month...*). "Just a decade ago the region used to have water scarcity for three to four months. Drinking water situation was manageable as villages had earmarked sources for drinking purposes. But in the last eight years the water scarcity remains there for close to nine months and drinking water availability has come down drastically," says Sanjay Vijayvergiya of Centre for Policy Analysis, a research organization based in Lucknow.

Many local residents said that the large number of out migration in 2008 is due to lack of availability of drinking water in villages. In Bangaon village in Tikamgarh district one-fifth of its 1000 population migrated out. "First few years of drought took away our agriculture and we worked in government projects. But last two years our drinking water sources dried out. Women travel six kilometers to fetch a bucket of water. The other option is to migrate out for working in urban areas," says

Poverty line: Rs. 360/month, spending on water: Rs. 1250/month

Someone shouts 'the water tanker has come' and suddenly almost everyone leaves whatever work they were doing earlier. Everyone rushes to the spot where the tanker has arbitrarily parked, carrying plastic pipes and utensils with them. As they approach the tanker, everyone tries to be the first to push his or her pipe into the tanker to extract water. Within a few minutes the 4800 litres tanker is empty.

This is a scene that is repeated several times every day in Ranipur, a small town of 30,000 people in Jhansi district. At an average people pay Rs. 125 every third day to buy 1000 litres of water if they could afford it. That makes a monthly spending of Rs. 1250. This is more than three times of the poverty line figure of Rs. 360 for rural areas. Ranipur has around 45 percent people below this poverty line.

Bharat Dogra for WaterAid India, May 2008

Conflicts over drinking water are rising threatening emergency supply provisions

Jugal Kishor, a 60-year-old resident of the village. The village had just one of the four wells with water.

In the first week of May 2008, the Mahoba development block reported 35,000 people migrating using the railways only, local railways officials point out. Railways figure from Jhansi suggested that 1,08,000 people had migrated out. Officials informed that the trains running through Jhansi were carrying eight times more passengers than the total strength of all trains passing through the station. "There were reports of heavy rush in railway stations. We issued much more tickets than the total strength of all trains passing through the station," said BK Pandey, the station master of Mahoba railway station. "The main reasons for this kind of migration were lack of drinking water and failure of government programmes for drought relief," said Harishchandra, a journalist working with Hindi daily newspaper Jansatta.

The money push

Going by the data available with the Department of Drinking Water Supply, Government of India, during 2005-08 (till March 31st), the state governments and the central government had spent Rs. 50,562.16 lakhs for drinking water purpose only (See table: Money pours in). The Union government gave the MP government Rs. 10 crore as emergency aid for

Money pours in

In the last three years the Bundelkhand region has got substantial government money for drinking water. An indicator of the crisis: spending has more than doubled in the last three years.

Year	Money spent (both state governments and the Union government) in Rs. Lakh
2005-06	11,394.77
2006-07	10,868.19
2007-08	28,199.20
Total	50,462.16

Source: Department of Drinking Water Supply, Rajiv Gandhi National Drinking Water Mission, New Delhi, 2008

drinking water provisions in 2008. The state government made provision for Rs. 150 crore for drinking water in the state of which around 30 percent was meant for the Bundelkhand area. In the 2008-09 state budget the UP government declared Rs. 176 crore for drinking water provisions out of which the Bundelkhand region accounted for around 20 percent. The state government claims to have built 4,682 new handpumps in seven districts and has repaired 6,591 handpumps (See table: State of response).

The UP government has tripled its commitment for the Bundelkhand Vikas Nidhi from Rs. 4,892.6 lakh in 2003 to Rs. 15,616 lakh in 2008. In its overall spending on soil and water conservation works for the state, it has

spent Rs. 83,569 lakh out of which 35 percent was meant for Bundelkhand areas during 2002-07. Similarly, during 2002-07 the state government has spent Rs. 3,638 lakh on drought prone areas programme. The MP government has also around Rs. 4,781 lakh during the same period on soil and conservation activities. It has spent Rs. 21,294 lakh on drought prone areas programme out of which around 25 percent meant for the Bundelkhand areas. Till May 2008, the state government spent Rs. 243.80 lakh (from April 2007) for supplying water through tankers in the five districts, according to the state government's drought relief department data.

Emergency measures

The Madhya Pradesh government has undertaken a number of measures to combat drinking water scarcity in the drought affected region 2008. They are:

- Regular maintenance of all installed handpumps. Extension and replacement if necessary, of the riser pipes in hand pumps.
- Drilling of new tube wells at suitable sites and installation of hand pumps on them.

Inequality in access to water is further precipitated by inequality in landholding

Installation of single phase power pumps in tube wells, where the water level had depleted due to water scarcity.

- Implementation of water supply schemes by laying pipe line and installing cisterns, wherever required and possible. Assistance to the Panchayats in operation & maintenance activities of the existing piped water supply schemes.
- Drinking water transportation, wherever necessary, through the district administration.
- Water quality monitoring in the affected districts.
- Identification of suitable sites for making recharging structures in the villages where most of the sources had dried, after the prevailing scarcity period.

Government procured adequate quantities of water pipes and handpump spare parts and tools and created an inventory in all the districts. Availability of all these materials was monitored on a weekly basis. Teams of hand pump mechanics, sub-engineers and helpers were made. Hired vehicles were made available to them to undertake visits to the affected districts. These teams discussed the situation with villagers, sought their advice and sorted out their problems pertaining to hand pump maintenance. They checked the water quality and wherever necessary, disinfected the drinking water source. During initial visits of these teams, many problems were encountered but in subsequent rounds the maintenance problems became negligible.

Efforts were also made to create new sources, a little away from the villages where tube wells had dried up. Such sources were connected to the affected village by laying a pipeline and installation of cisterns. Necessary arrangements for disinfection of water were also made.

A case in the point is the example of two villages having predominant tribal population, namely Biharwara & Meharkhua. They faced acute water scarcity for most part of the year. As they were located on the hill top, water in the tube wells, drilled near the villages, was not adequate. Villagers carried head load of water over 3 kms and 80 meters (260 ft.) depth from the foot of the hill where the water was available through small springs. The PHE Department prepared a combined scheme costing Rs.24.50 lakhs. The spring water was collected in a sump and a pipeline was laid to a length of 2.2 kms to reach the two villages.

Law and disorder

The UP government's water resource department has reported 12 cases of its water tanks being looted in May 2008 in UP side of Bundelkhand. Media reports and state government press releases point that 35 reports were filed in police stations in UP districts in April on conflicts over water. The government deployed police force for protection of tankers in May and June.

In April 2008, the state government filed police reports against 2,000 farmers for 'stealing' water from Urmil water reservoir reserved exclusively for urban areas in Mahoba district. On the other hand the farmers said that they used to take water paying bribe to the irrigation officials every month. But due to constant drought they didn't have the money to bribe thus the police reports were to harass them.

The MP irrigation department in Chattarpur district lodged a case against the UP government irrigation department for forcefully constructing an intake well near the Urmil dam, being constructed under the Mahoba Drinking Water Reconstruction Programme. The Mahoba Drinking Water Reconstruction Programme, built spending Rs. 27 crore, dried. Police of both MP and UP guarded whatever water was left.

Water, reinforcing discrimination

Water is often used as a weapon for social suppression and show of power. In Bundelkhand the caste system is deep rooted. Population belonging to lower castes suffer from discrimination as far as government doles and local resources are concerned. Water sources are normally a major source of discrimination. In face of a crisis like the current drought when water has become a scarce resource, such population faces increased discrimination.

On May 22 2008 during a public hearing on solutions for drought in Bundelkhand in Jhansi organized by Parmarth, such discrimination came into sharp focus. Of 30 people who spoke in the public hearing representing equal number of villages, 25 mentioned caste-based discrimination in access to water sources. All of them were in unison that in such a crisis the discrimination was a harsh punishment. It is also seen in many villages that water tankers provided by government invariably reach to higher caste settlements first.

On June 7 2008, 15-year-old Daya Shankar and three fellow villagers, all Dalits, were arrested for 'capturing' a tanker delivering drinking water to their village Mudhari in Mahoba district. Three armed policemen are since on duty to ensure that tanker water is distributed fairly in Mudhari. The youths told police that as they were never allowed to take water from the tanker, they had to 'capture' it.

Inequality in access to water is further precipitated by inequality in landholding. "When groundwater falls, the preponderance of more numerous and deeper tubewells in the better-off households makes it more likely they would have access to water, if at all. It is only the better off land owners who have the wherewithal to use diesel pumps to access declining water," reports the fact finding team of Kashipur Solidarity Group. For example, village Galan in Chhattarpur district. The village's 35 SC households have one tubewell while the upper caste households of 50 have 15 tubewells. The tubewell for the weaker section of the village hardly yields water and is frequently out of order. During such periods, the dalits go to the tubewells in upper caste areas. "There they face discrimination in collecting water. As a practice upper caste people deter the weaker section people from taking water. Sometimes, their cattle get first priority over drinking water needs of the weaker section people," says Nagesh, a member of the fact finding team that visited this village. ■



Deforestation meant fast soil erosion and silting up of tanks and wells. The net result: drought and drinking water crisis





Designs for drought

Environmental degradation has created the crisis but inappropriate policies have perpetuated it

Frequency of drought in Bundelkhand is increasing. Government records show that Bundelkhand used to have one drought in 16 years during the 18th and 19th centuries. From 1968 to 1992, the region saw a drought in every five years. But in the 21st century the region has already suffered seven years of drought. Elders in the region do agree that drought is becoming pronounced; even with a minor deficiency in rainfall the region suffers severe drought.

This is ironical given that the average rainfall in Bundelkhand area ranges between 750 mm to 1,250 mm. And it rains for around 100 hours a year. The average rainfall is comparable to many of the well endowed states in term of rainfall. Add to it the safety net of community-managed tanks and other water harvesting structures (See box: *Tikamgarh floats on water*). There are around 4,000 such traditional structures and most of them are as old as 1000 years. Even now some people in the region do depend on tanks for irrigation and drinking water.

A vicious cycle

The scarcity of water is a direct fall out of environmental degradation and policies that encouraged centralized management of water resources post-Independence. Ecological degradation combined with government policies that took away community ownership from traditional systems has wrought havoc for the region. Off late governments encouraged use of groundwater but didn't take care of the recharge aspect. The traditional wells and tanks are the recharge instruments. Without them groundwater couldn't be recharged in proportion with withdrawal. Add to it the massive deforestation in the catchment areas.

Deforestation meant fast soil erosion and silting up of the tanks and wells. Experts say that government involvement in maintenance of tanks and other rainwater harvesting structure has eroded the sense of community ownership. "Traditional Chandela, Bundela or Peshwa tanks and Haveli system of cultivation were neglected and could not be integrated with modern technologies, management of resources, livestock production, value addition and market driven economy," says the high level fact finding group. At the same time, the extraction of groundwater was speeded up. The results are there for

An interesting aspect of current drought is the scarcity of drinking water. It was never so in the past

Tikamgarh floats on water!

Tikamgarh, and Bundelkhand in general, is famous for its Chandela tanks. Official records have mention of approximately 995 such tanks in the district. At present about 421 tanks exist. Some of them are of considerable size and capacity including the tanks at Baldeogarh, Bamhauri, Barana, Lidhaura, Jatara and Bir Sagar. At least 49 tanks, including the above mentioned, have an area of more than 40 Ha each. Out of this, 317 belong to various government departments and the rest are with communities. However, most of them are not in functional condition. It is inferred that due to the decline of such structures the drinking water condition got worsen as well as it caused fast dip in groundwater level.

Source: Compiled from various government sources

everyone to see. After the drought of 1985-88 handpumps were installed. There was abundance of water in the first year. Then the water-table went down over the next three years by 15 metres a year on average. All the 5000 wells of Damoh district which used to serve as a secondary water supply scheme became defunct, and the problem of water supply became acute.

Deforestation started it all

Historically, dense forests covered almost entire region of Bundelkhand. “Till the beginning of the 19th century about 30 percent of the total area of Hamirpura (including Mahoba district) was covered by dense forest,” says a survey report of Oxfam, an international NGO. In UP side of Bundelkhand, the forest area is only 7.75 percent now. In the MP side the forest cover is 26.2 percent which was around 40 percent in 1950s. The inter-ministerial central team reported that 64 percent forest in UP and more than 50 percent in MP are degraded. Way back in 1989, the Planning Commission of India put a stern warning on the linkage between deforestation and depleting groundwater, a major source of drinking water for the region. “Bundelkhand, devoid of forest cover, looks like a barren land with naked mounds of hills. The problem of soil erosion, soil filling into the ponds making them useless, direct flow of rainwater into the rivers, depleting ground water resources and unproductively of the land, all these are the emerging issues in Bundelkhand which have roots into the depletion of forest cover,” warned the report ‘Study on Bundelkhand’.

Logging and mining are two major reasons for deforestation. Mining of hills for stones used in construction is a major source of deforestation on hills. A fact finding report by the Kashipur Solidarity Group (an association of activists, scientists and environmentalists) in May 2008 pointed out mining at the core of all environmental degradation in the region. It cited the example of Mahoba district, known for its rampant stone mining. “900-1200 trucks loaded with stones leave this area everyday for Kanpur, Lucknow and elsewhere. And about 15 rigs (an entire trainload) each with 58 bogeys, each bogey containing 60 tonnes leave in the direction of Jhansi every month. That is, roughly, over 50,000 tonnes each month,” estimated their report using local inputs. Mahoba’s Kabrai is the epicenter of these stone mining activities. The area was dotted with densely forested hills but now left with just barren and badly bruised mounds.

Death of a tradition

An interesting aspect of current drought in the region is the scarcity of drinking water. Earlier, drinking water never became scarce during drought. The network of traditional water harvesting structures ensured that even in worst rainfall scenario there are structures with water exclusively for drinking purpose. Till 1980s, around 70-80 percent of drinking water need was met from dug wells. Even now most drinking water demand is met through such traditional structures. “The wells in the village had plenty of water throughout the year. Even in the year when the monsoon was below normal, there was no shortage of drinking water for humans and animals,” says a report of the Development Alternatives. There are around 2.8 lakhs dug wells in the region for drinking water purpose though most of them have dried this season.

Studies conducted by NGOs and other agencies indicate that in the last 20 years, canals and tube wells have become the predominant sources of irrigation in Bundelkhand. “Most of the traditional structures have fallen into disrepair or have completely been destroyed,” according to a study by the Delhi-based NGO, Development Alternatives.

A study on traditional and modern water resources conducted across 60 villages in the UP part of Bundelkhand reveals that more than 54 percent of wells are in unserviceable condition and more than 50 percent of ponds have dried up. The study was conducted by Church’s Auxiliary for Social Action (CASA) and Jan Kendrit Vikas Manch – a network of NGOs in Bundelkhand (See table: *In bad shape*). “Indiscriminate felling of trees, over

There is a mismatch between groundwater extraction and recharge. This impacts drinking water availability

Water availability is affected by decline or slow growth in dug wells that also recharge groundwater

In bad shape

Most water bodies in Bundelkhand (UP side) are in ruins

Water sources	Total	Unserviceable	Reasons
Wells	486	266	Less rainfall, low impounding of water in wells, no maintenance
Ponds	56	29	Drying up, encroachment
Rivers	6	4	Drying up, no dredging and overuse/misuse
Drains	26	25	Disrepair, embankments, encroachment and disrepair

Source: CASA

exploitation of groundwater, excessive chemical fertilizer use, soil erosion, low ground-water table and scanty rainfall contribute to the drought situation in Bundelkhand,” the study says.

The numbers of open wells (which recharge groundwater) have increased but only marginally. In Jalaun district in UP, for example, they increased from 2,134 in 1995 to only 2,153 in 2004, an increase of 0.89 percent. “Water availability in rural areas was affected by decline or slow growth in wells that also recharge groundwater,” notes another study by Parmarth Samaj Sevi Santhan.

In a recent workshop organized by the UNICEF and OXFAM, many experts pointed out that 40 years back the consolidation of land (popularly known as Chakbandi) triggered the near chronic drought situation in the region. Because of the consolidation drive the traditional agricultural system and the water harvesting structures got destroyed. “Knowledgeable farmers are of the opinion that the natural conservation system developed in thousands of years was severely damaged and most of the natural watersheds and catchments have found barriers in the water flow channels due to the consolidation,” found the workshop.

A suicidal trend

Bundelkhand has geological disadvantage – its underground granite layer doesn’t allow plenty groundwater recharge. That is the reason why the area is dense with surface water harvesting structures or shallow dug wells. But off late the predominantly agrarian region is depending on groundwater for irrigation (See table: *Groundwater Structures in Bundelkhand*). In UP side, 26 percent of net irrigated areas draw water from groundwater sources while minor surface water source contributes two percent. Similarly in MP side, groundwater accounts for 33 percent of net irrigated areas while minor surface water source contributes nine percent.

In the region on an average 31 percent of replenishable groundwater have been used and there are estimates that further use may not be possible. Or it will lead to water imbalance. “Present drought cycle of four years has completely depleted the available resource in the absence of recharge from rainfall and it is unlikely to take quite a few years to replenish aquifers if the good rainfall is restored(*sic*),” warns the report of the central

Groundwater structures in Bundelkhand

Sub-region	Deep tubewells	Shallow tubewells	Dug wells	All structures
Numbers				
UP	4604	44870	78476	127950
MP	3124	16394	197507	217025
Bundelkhand	7728	61264	275983	344975
Average area irrigated (Ha) per structure				
UP	37.5	3.5	2.1	3.9
MP	1.59	3.2	2.7	2.7
Bundelkhand	23.0	3.4	2.5	3.1

Source: Inter-ministerial team, June 2008 New Delhi

Government is encouraging water-intensive crops. This has a direct bearing on the groundwater and thus on drinking water availability

Industries deluge Bundelkhand

Though there is hardly a live stream or well in the region, the MP government has been promoting water intensive industries for development of the region. In April the MP government organized the Bundelkhand investors' meeting that saw signing of 36 MoUs worth Rs. 29,549 crore. All the MoUs are for using the region's mineral resources and none for agriculture. Bundelkhand is rich in iron, rock phosphates, diamonds, pyrophyllites, granites, dolomites, limestones, sandstones and marble. Out of the 36 MoUs, six were for steel and captive power plants, five for cement plants, 11 for iron and ferro-alloy and one for alumina. All these industries are water guzzlers. The government has promised all the industries preferential land and water sources. However, there were eight MoUs for taking up large-scale Jatropha and bio-diesel plantation. These are water intensive crops and there are reports of such crops leading to depletion in groundwater. Chief Minister Shivraj Singh Chouhan said that the industrialization in Bundelkhand is a part of his government's strategy to fight chronic drought.

Source: Compiled from various government sources

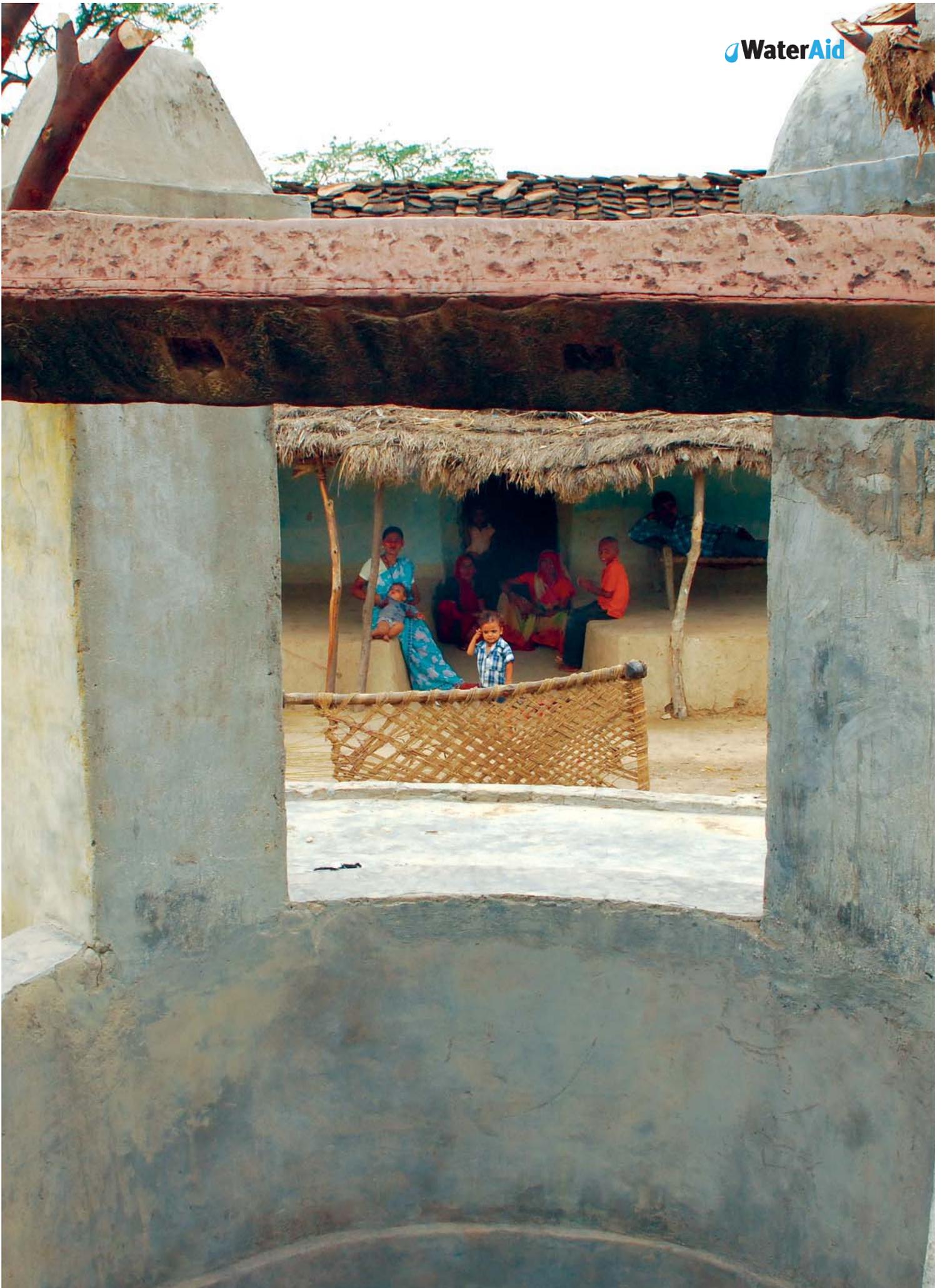
team.

Ironically, government is encouraging water-intensive crops. This has a direct bearing on the groundwater and thus on drinking water availability. For example, menthe cultivation in few districts has drastically depleted groundwater. It requires watering 18 times within a crop cycle. Mentha is being touted as the cash cow for the drought stricken Bundelkhand farmers. But its impacts on the local ecology, particularly groundwater, are devastating. A recent study carried out by Lucknow-based Centre for Contemporary Studies and Research (CCSR), in association with Jalaun-based Parmarth Samaj Sevi Sansthan, found that most of the low income farmers have switched over to menthe cultivation.

But analysis of last five years of data shows that it has not fetched much profits. While almost all the families are cultivating mentha for the past five years, the study shows it has not translated into high income for them. Moreover, if mentha is cultivated on dry land, water requirement increases in accordance with the water content of the land. The study data suggests that the irrigation cost incurred by a menthe farmer is Rs 8,856 per acre for two cuttings and Rs 10,824 per acre for three cuttings. "It is important to note here that this cost reflects only the expenditure on diesel and rent for pump set and does not include the water price. One can easily presume what cost Bundelkhand is paying for mentha cultivation!" wondered Sinha. One time watering of mentha crop needs 8 to 10 hours of water pumping (from an electric pump). It requires 50 lakh litre water per acre to produce 30 to 35 litre of mentha oil (average production/acre). That is more than one lakh litres of water needed for one litre of menthe oil.

If this was not enough, the MP government is industrializing the region with water guzzling plants. In annual Bundelkhand Investors' Meeting the government has promised preferential water and land for industries to set shops (See box: *Industries deluge Bundelkhand*). ■





Many villages in the drought ravaged Bundelkhand have put in place community-driven systems to secure drinking water. They hold few lessons





Building Bundelkhand

There are few villages in Bundelkhand who were shocked but not shaken by the drinking water crisis during the drought. These villages distinguished themselves as drinking water secured even at this time of crisis

It was not that difficult for the villagers to achieve this feat. They revived their tradition, revived water conservation structures and put in place an integrated ecological regeneration plan that give them water now and forever. Interestingly, many of them have used government programmes to their benefits.

Full mark to Mastapur

The smile on faces of Mastapur's women is unusual as the fifth consecutive drought has ravaged the village economy like never before. "It is just that we get drinking water every day and that also without facing much problem," says Hari Singh, a village resident. The village in Jatara Block of Tikamgarh district is a refreshing experience when you travel across the region. Like elsewhere in the region, most of the 25 wells have dried up in the village, although a little water accumulates in some wells if a long enough interval is provided between efforts to collect some water. Even the river Jaamni which flows about 1.5 km. from the village has dried, although a little water exists in a few ditches here and there.

In this extreme water scarcity situation Parmarth's effort to at least partially quench the thirst of villagers has become important. Supported by WaterAid funds, this voluntary organisation sends a water tanker thrice a day to various mohallas (habitation of the village). In comparison to a tanker sent by Panchayat, this tanker dedicated to serve this village makes more rounds and provides clean water. What is more, it gives priority to the needs of the weakest sections who suffer the most problems. The tanker cannot entirely meet the water needs of these communities, but it can provide them some help. It also has a larger role in bringing social activists in closer touch with the most vulnerable communities.

An oasis

It is more than four years that Hamirpur village in Jhansi district has geared up for braving the drinking water crisis. Their efforts are bearing fruits – it is arguably a rare village in Bundelkhand that doesn't depend on water tanker for drinking water purpose. The village has taken up an integrated approach to water harvesting to tide over drinking water crisis – it has taken up recharge of groundwater as well as a community managed water supply system for sustainability and equitable distribution.

In fact few of its residents have come back to the village to put in place a water supply system and to inspire all households to tap rooftop rainwater for recharging the fast depleting groundwater. The recharge pit has become a new feature to every household in the village; there are 50 such pits that inject rainwater directly into ground.

In a unique system it allowed contractors to lift soil from a silted up traditional pond. "It helped us in deepening the pond that would recharge the groundwater. The first few showers have already filled up the pond partially. This year two nearby handpumps that stopped yielding water would give water," says Manu Lal, a 70-year-old resident. The village has contributed in form of labour, has pooled in money from various sources including few supports from WaterAid and a local NGO Parhit to build a water tank linked to a borewell.

Villages adopting integrated water resource management are successful in attaining long-term drinking water security

“Now we are thinking in term of laying the pipes from the tank. Villagers are contributing money to finish the work,” says Bhagwan das Pal, the president of village development council.

Extreme makeover

In Jalaun’s Himmatpura village it is mandatory that each household harvests rooftop water, even if you have thatched roof. Each and every house here has laid pipes that harvest rain-water from the slopping tiled roofs and direct that to an abandoned tubewell. “The village had enough drinking water problems. The tubewell dried. So we thought of injecting rainwater flowing down from our roofs to it,” says Sanju Kumar, a resident. At an average if it rains for half an hour, each house would be injecting around 700-1000 litres of water into the ground aquifer. “Women in this village face fewer problems in collecting drinking water as we have still water gushing out of our tubewell and handpumps. And that is the result of our three years of efforts,” says Kumar.

A pond in spate

Kanti village had never imagined that drinking water would be scarce in the village with three ponds and three dug wells. It did happen for real last year. Government tankers would make guest appearances in the village. Village women would walk for two kilometers for fetching a bucket of water. It turned life upside down. Elders in the village asked for revival of the ponds in the village. Kanti formed a water committee. The committee dug new wells and revived the old ones. To recharge groundwater, they deepened three inter-connected ponds. In June after few hours of showers, all the ponds were full. Water had already started seeping in the wells. The village has already made its water budgeting: the village has sufficient water for the whole year. “You should see the larger pond on the other side. It looks like a river in spate,” says Bal Kishan, a member of the village committee.

Reclaiming history

It is hardly 10 years ago that the Rajpura village in Jalaun district was facing problem of water logging. But the five years of drought left it completely dry. The village took it as an opportunity. It asked the Panchayat to build one pond while volunteered labour for another pond. In an innovation it also put a groundwater recharge pit right in the middle of the pond. The village was preparing for herd out its drinking water crisis for ever – the recharged groundwater would appear in its handpumps and dug wells. The village renovated another well and put in a handpump for community use. “We have drinking water now. Hardly any villages nearby have that this year,” says Raman Dixit, a village resident. “It will not be water logged again but water security henceforth.”

There are several such examples in the region that demonstrate that making available drinking water at this time of crisis is rather feasible as well as sustainable. The above villages have turned a crisis into an opportunity. There are few key lessons from these experiments:

- All the villages have taken up short- term as well as long- term measures to fight drinking water crisis.
- An integrated approach has been adopted in all the villages. Recharge and overall local ecological regeneration have been given priority.
- These villages have set up strong community level institutions that are both practical and effective.





The crisis of Bundelkhand has ramifications for all drought-prone areas. The sooner we learn the lessons the better it is as India's 68 percent areas are drought prone





The crisis and a few lessons

Constant deficit rainfall has definitely contributed to the current crisis. But what has precipitated it is the decline of the traditional water harvesting structures created to face such crisis. The decline, on the other hand, is a result of long-term policy failure. As many studies and policy reviews indicate, the modern system should have learnt and retained the traditional system while drafting new policies

The current crisis comes as an opportunity to fix this problem. The Union government is about to declare a drought relief package for the Bundelkhand region. It has made substantial commitment for water conservation and irrigation. But governments have spent huge amount of money earlier also in drought relief. What is needed now is long-term relief from drought. To do this government must fine tune its policies to community needs and wisdom.

- **Safe drinking water must get top most priority in drought management:** The current situation points at ignorance of drinking water availability and supply and security. While managing drought it must be factored in that both agriculture and domestic water consumption gets priority. Mechanisms including institutions must be set up at all levels.
- **Appropriate water management based on the ecology:** Overdependence on groundwater must be curtailed. There is a need to make a shift from the current groundwater extraction to surface water utilization and management. Rainwater harvesting must get precedence as water scarcity has been a problem of management rather than availability. Unless this is done, no matter how much it rains, there will be water scarcity. Revival of traditional tanks under schemes such as NREGA, Drought Prone Area Program and Desert Development Program in addition to creation of new assets is inevitable. For this to be effective we need to have appropriate integrated land and water development programmes.
- **Making government schemes effective:** There are a large number of government schemes that cater to or related to drinking water needs. There must be serious and sustained effort to revive them and to fine tune them to local needs. Without this we may keep on creating infrastructure but without much impact on local drinking water availability.
- **Drinking water security plans:** Every village must be encouraged, and accordingly supported, to make its drinking water security plan keeping in mind the drinking water needs of human and livestock population in long-term.
- **Promotion of appropriate industries, not water intensive ones:** Government must do water availability and impact assessment before allowing industries or other activities that need huge amount of water. Village water security should get precedence.
- **Agriculture policy must be redrafted:** Current agriculture policy has not been able to take care of rainfed agriculture needs. Rather it prescribes a cropping pattern that is not suitable for rainfed situations. So there is an urgent need to change agriculture

It is undoubtedly constant deficit rainfall is a major reason for the current crisis. But what has precipitated it is the decline of the traditional water harvesting structures created to face such crisis

policy that takes care of local ecology and does not promote water intensive crops.

- **Government and communities must be partner in long-term crisis management and drinking water security:** Government needs to initiate large-scale awareness campaign on water conservation to avert situation like Bundelkhand in long run. Communities must also put in their efforts in water conservation at their own levels.
- **Civil society monitoring of government programmes:** There is no dearth of government programmes and funds. Problem lies in effective implementation and monitoring. Civil society groups and the community must play a proactive role in monitoring such programmes. That will not only help government getting feedback on its programmes but also put it under constant public scrutiny. ■



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- ⁱ Based on MP and UP governments' drought declaration for districts in Bundelkhand. While some districts have been declared drought affected for the last five years, few have been declared drought affected for the last seven years. The Union ministry of agriculture has categorized the Bundelkhand region as chronic drought prone areas.
- ⁱⁱ Based on actual rainfall in comparison to the average annual rainfall for the region.
- ⁱⁱⁱ Based on presentation of various experts during WaterAid India's Citizens Report regional consultation in Jhansi on June 14 2008
- ^{iv} Personal communications, residents of Bundelkhand areas, April-June 2008
- ^v Report of the inter-ministerial central team, Delhi, May 2008
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- ^x 'Monsoon currents losing intensity', The Times of India, Lucknow, June 27, 2008
- ^{xi} The figure of 16 million people is the number of drought affected people in 2008 as estimated by state governments. The estimate of 5,000 tankers come by summing up district-wise government figures on tankers supplying water to villages during March-June 2008.
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WaterAid is an international charity established in 1981. It recognizes water and sanitation as basic human rights and the foundation for overall development. Presently, WaterAid works in 17 countries across Asia, Africa and the Pacific region.

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WaterAid started working in India in 1986. It works in 10 states – Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Jharkhand, Karnataka, Madhya Pradesh, Orissa, Tamil Nadu and Uttar Pradesh.

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