

SR-4/99-2000

**SOME NEWS REGARDING HYDROLOGICAL
PROBLEMS OF THE COUNTRY**



आपो हि ष्टा मयोभुवः

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1999-2000

PREFACE

The hydrological problems of the country are varying time to time. The recurring floods in West Bengal and Bihar and drought in another parts of India are common. Our water and land resources are acute due to steady rise of population and improvement of the standard of living particularly during last two decades or so. River pollution, Water quality, Soil erosion, ground water table, water logging are some of the important example of interdependent problems. As the water availability is one of the main problem of the country in this millennium, it is expedient to make all efforts to instill a sense of awareness and importance of water resources.

By keeping all these objectives in view, this report is an attempt to find the various hydrologic information and events reflecting the problems and indicating the work towards the solutions for hydrologists, planners and managers of water resources in particular. The hydrologic information is collected from various Newspapers for the year 1999. All the information about the various hydrologic problems has been catogrised under twenty-five hydrological sub-fields (Table 1). Also a matrix of the hydrological basin vs. hydrological problems is prepared and given in Table 2.

This report entitled "Some News regarding Hydrological Problems of the Country" is a part of work programme of the Hydrological Information System Division of the Institute for the year 1999-2000. This compilation study was carried out by **Dr.(Mrs.) Rama Devi Mehta, Scientist 'B'** and **Mrs. Deepa Chalisgaonkar, Scientist 'E'** of the **Hydrological Information System Division**. Mr. Pradeep, library attendant has assisted during this report.



Director

CONTENTS

DESCRIPTION	PAGE NO.
Table 1: Content Numbers of the News from newspapers versus specified Hydrological Problems.	ii
Table 2: Hydrological Problems of Specific Basins versus Content Positions.	iv
1.0 Introduction	1
2.0 Contents Layout	2
3.0 Problem Index with Titles	3
4.0 Financial Express (FE)	14
5.0 Hindustan Times (HT)	18
6.0 Deccan Herald (DH)	37
7.0 Hindu (H)	41
8.0 Times of India (T)	59
9.0 Indian Express (IE)	74
10.0 Concluding Remarks	87

Table 1: Content Numbers of the News from newspapers versus specified Hydrological Problems.

S. No.	Topics	Content Numbers
1.	Ground Water Hydrology	FE1, HT2, HT7, HT14, HT25, HT31, HT33, DH1, DH2, H11, H16, H30, T9, IE3
2.	Water Crisis	HT2, HT5, HT10, HT27, H7, H9, H13, H19, H30, T1, T2, T6, T16, IE3, IE4, IE5
3.	Land / Soil Erosion	T11
4.	Drought Management	HT9, HT12, IE3
5.	Water Pollution	HT1, HT8, HT32, DH2, H5, H14, H16, H23
6.	Flood Hydrology	H17, H18, IE17
7.	Water Policy /Bill / Water Management	HT24, H3, H10, H19, H28, H29, T1, T13, T14
8.	Environmental Hydrology	HT1, H18, T10, IE4
9.	Watershed Hydrology	H2, H22
10.	Forest Hydrology	H17, IE6
11.	Waterlogging / Soil Salinity	HT31, HT33, H6
12.	Artificial Rain	IE14
13.	Surface Water Hydrology	HT16, HT22, HT27, HT28, HT30, DH3, H18, H21, H27, T11, IE8, IE18
14.	Water Harvesting	HT5, H14, H26, T2, T3, T4, T5, IE2, IE16
15.	Lake Hydrology / Lake Pollution	HT17, H12
16.	Water Availability	HT4, HT21, T15
17.	Climatology	IE8
18.	Potable Water	HT24, H9, H15, T9, IE1, IE13
19.	Water Quality	FE1, HT13, HT14, HT15, HT19, HT20, HT23, HT25, H7, H18, T8, T17, IE10, IE15
20.	Inter-basin Water Transfer	HT11, HT18, HT26, HT29, DH4, H10, T18, IE19
21.	Water Conservation	H25
22.	Dam Hydrology	HT6, HT22, H4, H8, H20, H24, T12, IE7,

		IE11, IE12, IE18
23.	Indian Ocean / Sea water Intrusion	FE2, H6
24.	Urban Hydrology	FE3, HT3, HT15, DH4, H1, H22, T7, IE2, IE9
25.	Global Warming	T7 , T10

Table 2: Hydrological Problems of Specific Basins versus Content Positions

S.No.	Specific Basins	Content Positions
1.	Almatti Reservoir	HT29
2.	Ajwa Dam, Gujarat	IE11
3.	Arabian Sea & Bay of Bengal	FE2
4.	Betwa River M.P.	HT18, HT19
5.	Bhakra Dam / Canal	HT22, H8, IE18
6.	Bhoj Wet Land Project, M.P.	H12
7.	Cauvery, Karnataka	DH4
8.	Chaliyar River, Kerala	H23
9.	Chambal River, Rajasthan	HT18
10.	Dharoi Dam, Gujarat	T15
11.	Ganga Basin, U.P.	H11
12.	Ganga, Bihar	HT30, H11
13.	Gangilli River, Karnataka	H21
14.	Ghaggar River	HT17
15.	Godavari, Orissa	H20
16.	Gomti Basin, Lucknow, U.P.	H16
17.	Hemavati River	DH3
18.	Indravati River, M.P.	HT16
19.	Indira-Gandhi canal	HT28
20.	Kandaleru Reservoir, A.P.	IE19
21.	Kolar Dam, M.P.	T6
22.	Kosi River, Bihar	IE17
23.	Krishna River (Karnataka)	HT29
24.	Narmada Basin, M.P.	H24, IE9
25.	Nimbark Dam	HT6
26.	Pacific Ocean	T10
27.	Pushkar Lake	HT17
28.	Rajasthan Canal	HT26
29.	Rajiv Gandhi Lift Canal	H9

30.	Ranjit Sagar Dam, Punjab	H20
31.	Ravi River, H.P.	H20
32.	Sardar Sarover Project, M.P.	H24
33.	Sirhind Canal	HT26, HT28
34.	Sota Island	IE15
35.	Spring	HT10
36.	Upper Lake, M.P.	H12
37.	Yamuna Basin	HT15, HT32, H5, H11, T8

1.0 INTRODUCTION

The news is in many ways the tip of the knowledge pyramid and represents a part of information collection. It is a key to the society. Water as the medium of life has been a well-recognised fact since time immemorial and it is one of the most important natural resources available to the mankind. The available water resources are limited and unevenly distributed in time and space. Due to its multiple benefits and problems created by its excess, shortage and quality deterioration, the water has a unique role as a resource and deserves special attention of developers and planners. Planning and decision making must therefore achieve new levels of integration, reliability and acceptance. This demands timely, accurate, representative and comprehensive news about the status of water resources, the demands made on them and the economic, social and environmental dimensions of water use.

Keeping this in view, the hydrological news available from print media for 1999-2000 have been collected and compiled in this report problem wise and basin wise for the whole country. Five national newspapers have been referred for this purpose and the available news has been categorised in 25 sub-sections according to the problems faced by the country. For the convenience of the readers, a matrix has been provided amongst the problem and the position index of the contents with respect to the problem reported in Table-1. Table-2 serves as a matrix to indicate the water bodies where the different problems have taken place. As such, the reader can easily go through the reported hydrologic events according to different classified problems subjectwise and basinwise.

It is an attempt to cover important hydrology and water resources related news and events to the extent possible. However, it may be taken as a compilation of the hydrological news. The feedback from it can generate significant benefits to operation and management that are difficult to define in advance.

2.0 CONTENT'S LAYOUT

News Numbers used,
here, 'FE' stands for
Financial Express'

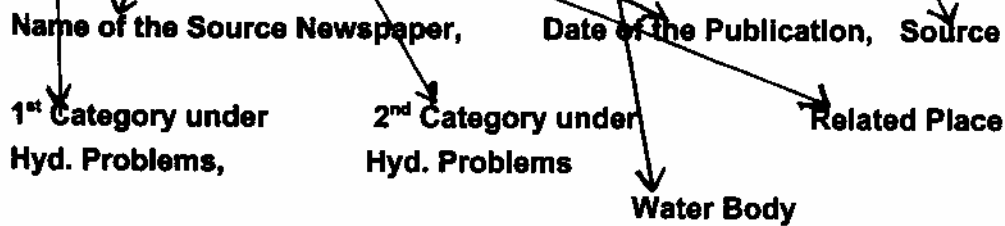
Title taken from Newspaper by Author,

FE 1) Project to tackle arsenic poisoning in Bengal

Arsenic poisoning from groundwater has become a serious problem in the Gangetic delta. High levels of arsenic, occurring naturally in geological formations, leads to a painful skin disease, arsenicosis. To combat the problem, the India Canada Environment Facility (ICEF), in collaboration with the All India Institute of Hygiene and Public Health (AIIPH), has initiated a project, worth Rs 9.58 crore, to test the presence of arsenic in groundwater in tube-wells and to provide arsenic-free drinking water in West Bengal.

The institute has also developed cost-effective and simple-to-run arsenic cleaning 'plant', which can provide safe drinking water to several villages. Nath says that local resource mobilization and maintenance holds the key to a long-term solution to this. A lot depends on the success of the project, which can then be used as a model in different parts of the delta, particularly in Bangladesh, where arsenic poisoning has taken epidemic proportions in some areas.

(FINANCIAL EXPRESS, 19.9.1999, A.I.I. of Hygiene & Public Health, Calcutta)
(Water Quality/ Ground Water, West Bengal.)



Note: Similarly 'HT' stands for Hindustan Times, 'IE' stands for Indian Express, 'H' for Hindu, 'T' for Times of India and 'DH' for Deccan Herald.

3.0 Problem Index with Title

Financial Express (FE)

FE1) Project to tackle arsenic poisoning in Bengal

(Financial Express, 19.7.1999, A. I. I. of Hygiene and Public Health, Calcutta)

(Water Quality/ Ground Water, West Bengal, -)

FE2) Pollution over Indian Ocean can affect monsoon

(Financial Express, Wednesday, 16.6.1999, -)

(Indian Ocean, India, Arabian Sea & Bay of Bengal)

FE3) Canalways – Best bet to reduce pollution

(Financial Express, Monday, 31.5.1999, -)

(Urban Hydrology, Mega-cities, India)

The Hindustan Times (HT)

HT1) Pollution panel serves closure notices on 650 industrial units, New Delhi

(The Hindustan Times, 15.12.1999, Anju Sharma)

(Environment Hydrology / Water Pollution (Industrial), New Delhi)

HT2) Much of ground-water in Orissa untapped

(The Hindustan Times, 14.12.1999)

(Ground Water Hydrology / Water Crisis, Orissa)

HT3) Guwahati plan to end drainage woes

(The Hindustan Times, 6.12.1999)

(Urban Hydrology, Assam)

HT4) Water, water!

(The Hindustan Times, 5.12.1999)

(Water Availability)

HT5) Amritsar waters crisis: Plans afoot to solve perennial problem

(The Hindustan Times, 22.11.1999)

(Water Crisis/ Water Harvesting, Punjab (Amritsar))

HT6) Dam fails to solve farmers' problems

(The Hindustan Times, 14.11.1999)

(Dam Hydrology, Nimbark Dam)

HT7) Bad news from Punjab
(The Hindustan Times, 11.11.1999)
(Ground Water Hydrology, Punjab)

HT8) Pollution Choking Alwar
(The Hindustan Times, 1.11.1999)
(Water Pollution, Rajasthan)

HT9) Govt. declares 19,580 villages in Rajasthan as drought-hit
(The Hindustan Times, 01.10.1999)
(Drought Management., Rajasthan)

HT10) Severe Water Crisis Feared in Mussoorie
(The Hindustan Times, 29.9.1999, Shamim)
(Water Crisis, U.P., Springs)

HT11) Patel Govt not to give water to TN
(The Hindustan Times, 22.9.1999)
(Inter-basin Water Transfer, Karnataka & Tamil Nadu, -)

HT12) Orissa in the grip of drought
(The Hindustan Times, 22.8.1999)
(Drought Management, Bhubaneswar, Orissa)

HT13) Poisonous water
(The Hindustan Times, 19.8.1999)
(Water Quality, Orissa, -)

HT14) Unsafe drinking water cripples Orissa villagers
(The Hindustan Times, 15.8.1999)
(Water Quality / Ground Water Hydrology, Orissa)

HT15) Yamuna poisoned, Delhi style
(The Hindustan Times, 16.7.1999)
(Water Quality/ Urban Hydrology, Delhi, Yamuna River)

HT16) As Indravati dries up, problems flood Bastar
(The Hindustan Times, 7.7.1999)
(Surface Water Hydrology, Orissa & Madhya Pradesh, Indravati River)

HT17) Pushkar lake pollution

(The Hindustan Times, 17.6.1999)

(Lake Hydrology, Rajasthan)

HT18) Rajasthan, M.P. To share Chambal-Betwa waters

(The Hindustan Times, 4.6.1999, K.S.Tomar)

(Inter-basin Water Transfer, Chambal – Betwa River Basin, Rajasthan & M.P.)

HT19) M-P river heavily polluted: Panel

(The Hindustan Times, 30.5.1999)

(Water Quality, Madhya Pradesh, Betwa River)

HT20) Malda is in grip of arsenic poisoning

(The Hindustan Times, 28.5.1999, Anil Maheshwari)

(Water Quality, West Bengal (Malda))

HT21) Large population yet to get drinking water

(The Hindustan Times, 22.5.1999, Satyen Mohapatra)

(Water Availability, India)

HT22) 100-metre breach in Bhakra main canal.

(The Hindustan Times, 14.05.99)

(Surface Water Hydrology / Dam Hydrology, Punjab, Bhakra Canal)

HT23) Our people, our world - Of poisoned water...

(The Hindustan Times, 9.5. 1999, Shree Venkatram)

(Water Quality, Bangladesh and West Bengal)

HT24) Contamination remains a crucial problem

(The Hindustan Times, 30.4.1999)

(Potable water/ Water Management, Delhi)

HT25) Ground water - raw & polluted, yet consumed

(The Hindustan Times, 29.4.1999)

(Ground Water Hydrology / Water Quality, New Delhi)

HT26) Punjab blamed for canal breach

(The Hindustan Times, 26.4.1999)

(Inter-basin Water Transfer, Punjab and Rajasthan, Sirhind and Rajasthan Canal)

HT27) Spectre of famine stalks Tripura, Agartala
(Hindustan Times, 24.4.99, UNI)
(Surface Water Hydrology / Water crisis, Tripura, Agartala)

HT28) Rajasthan hit by breach in canal, Sriganganagar
(The Hindustan Times, 24.4.1999)
(Surface Water Hydrology, Rajasthan, IG canal, Sirhind Feeder Canal)

HT29) Karnataka approaches SC over Almatti issue
(The Hindustan Times, 23.4.99)
(Inter-basin Water Transfer, Almatti Reservoir, Krishna River)

HT30) Sick Ganga struggles to survive in Bihar
(The Hindustan Times, 20.4.1999)
(Surface Water Hydrology, Bihar, Ganga River)

HT31) Water proves too much for "grain basket" Suratgarh (Sriganganagar)
(The Hindustan Times, 11.4.1999)
(Ground Water / Water Logging, Gujarat, Ghaggar River)

HT32) MCD responsible for 85 p. c. water pollution
(The Hindustan Times, 9.4.99)
(Water Pollution, Delhi, Yamuna)

HT33) Rising water tables threaten Haryana economy
(The Hindustan Times, 8.4.1999)
(Ground Water Hydrology / Waterlogging, Haryana)

Deccan Herald (DH)

DH1) Groundwater level dips in 72 taluks
(Deccan Herald, 11.12.1999)
(Ground Water Hydrology, Karnataka)

DH2) Groundwater in Mysore contaminated
(Deccan Herald, 9.8.1999)
(Water Pollution / Ground Water Hydrology, Mysore, -)

DH3) Hemavathi river in full flow; reservoir gates opened
(Deccan Herald, 5.8.1999)

(Surface Water Hydrology, Karnataka, Hemavati River)

DH4) Cabinet cancels township project near reservoir

(Deccan Herald, 1.7.1999)

(Urban Hydrology, India, -)

Hindu (H)

H1) India's first urban infrastructure fund

(Hindu, 23.12.1999)

(Urban Hydrology, India)

H2) Watershed Project in Uttarakhand

(Hindu, 21.12.1999)

(Watershed Hydrology, U.P. (Uttarakhand))

H3) 3 Districts chosen for water project

(Hindu, 18.12.1999, T. Ramakrishnan)

(Water Management, Tamil Nadu)

H4) Dams and Drinking Water

(Hindu, 1.12.1999, P.V. Indiresan)

(Dam Hydrology)

H5) A river reduced to a sewer

(Hindu, 24.11.1999, Alladi Jayasri)

(Water Pollution, Delhi, Yamuna)

H6) No Salinity in Cyclone – hit areas

(Hindu, 18.11.1999)

(Sea Water Intrusion/ Soil Salinity, Orissa)

H7) Punjab bid to boost rural water supply

(Hindu, 11.11.99)

(Water Crises / Water Quality, Punjab)

H8) Maneka calls for probe into benefits of big dam

(Hindu, 20.10.1999)

(Dam Hydrology, Bhakra-Nangal)

H9) Drinking Water projects "on a war footing"
(Hindu, 10.10.1999)
(Water Crisis / Potable water, Rajasthan, Rajiv Gandhi Lift Canal Project)

H10) Politics muddies river water issues
(Hindu 3.10.1999)
(Inter-basin Water Transfer / Water Policy, India)

H11) The World's Wells are drying up
(Hindu, 29.9.1999, N.N. Sachitanand)
(Ground Water Hydrology, Book review, Ganga, Yamuna)

H12) Water Hyacinth Colonises Upper Lake
(Hindu, 29.9.1999)
(Lake Hydrology, Madhya Pradesh, Upper Lake, Bhoj Wet-Land Project)

H13) Chakrata belt reeling under water shortage
(Hindu, 24.9.1999)
(Water Crisis, Uttar Pradesh (Garhwal))

H14) Porous concrete helps 'greener' water system
(Hindu 26.8.1999)
(Water Pollution / Water Harvesting, -, -)

H15) Unsafe Drinking Water Cripples Villagers
(Hindu 16.8.1999)
(Water Quality/ Potable Water, Orissa)

H16) Gomti ground water contaminated
(Hindu 10.8.1999)
(Ground Water Hydrology / Water Pollution, Lucknow (U.P.), Gomti)

H17) Godavari is rising
(Hindu 6.8.1999)
(Flood Hydrology, Orissa, Godavari)

H18) Fresh Inundations in Bihar
(Hindu 2.8.1999)
(Surface Water Hydrology/ Flood Hydrology, Bihar)

H19) Water project seeks entrepreneurs' cooperation

(Hindu, 28.7.1999)

(Water Management / Water Crisis, Coimbatore)

H20) Jinx dogs hydel project

(Hindu, 19.7.1999, Sarabjit Pandher)

(Dam Hydrology, Punjab; J&K; Himachal Pradesh, Ranjit Sagar Dam; Ravi River)

H21) Rains disrupt life in DK, Udupi dts.

(Hindu, 19.7.1999)

(Surface Water Hydrology, Karnataka, Gangilli River)

H22) \$240 million World Bank aid for two projects

(Hindu, 15.7.1999)

(Urban Hydrology / Watershed Hydrology, India, Projects)

H23) NHRC urged to probe river pollution issue

(Hindu, 14.7.1999, Staff Reporter)

(Water Pollution, Kerala, Chaliyar River)

H24) Digvijay Singh against big dams

(Hindu, 11.7.1999, Gargi Parsai)

(Dam Hydrology, Madhya Pradesh, Sardar Sarover Project, Narmada River)

H25) Simple System that saves water

(Hindu, 8.7.1999)

(Water Conservation)

H26) Insitu rain water harvesting in arid zone

(Hindu, 8.7.1999, K.Satyanarayana Reddy)

(Water Harvesting, Anantapur)

H27) One Month of Summer Rainfall

(Hindu, 6.7.1999)

(Surface Water Hydrology, India)

H28) Rajasthan Water policy ratified

(Hindu, 4.7.1999)

(Water Policy, Rajasthan)

H29) Monsoon: MCD control rooms set up in all city zones
(Hindu, 22.6.1999)
(Water Management, Delhi)

H30) Digvijay fears water crisis for M.P.
(Hindu, 21.6.1999, Staff Correspondent)
(Water crisis /Ground Water Hydrology, Madhya Pradesh)

Times of India (T)

T1) Gujarat officials told to expedite water projects
(Times of India, 29.12.1999)
(Water Crisis / Water Management, Gujarat)

T2) Precious water went down the drain in Gujarat
(Times of India, 27.9.1999)
(Water Crisis / Water Harvesting, Gujarat)

T3) A Crop for your roof-top
(Times of India, 25.7.1999)
(Water Harvesting, India)

T4) Want Water, harvest it
(Times of India, 25.7.1999, Pallavi Mittal)
(Water Harvesting, Delhi)

T5) Water experiments transform JNU
(Times of India, 25.7.1999, JNU)
(Water Harvesting, Delhi)

T6) Water may dominate election campaign in Bhopal
(Times of India, 20.7.1999, Sudhir K Singh)
(Water Crisis, Madhya Pradesh)

T7) Urban Pollution causing maximum damage to planet
(Times of India, 19.7.1999)
(Urban Hydrology / Global Warming)

T8) Yamuna: River of life dying a slow death
(Times of India, 17.7.1999, Varun Soni)

(Water Quality, Delhi, Yamuna,)

T9) Protect Ground Water: Expert

(Times of India, 12.7.1999)

(Ground Water Hydrology / Potable Water, India)

T10) El Nino helps slow global warming

(Times of India, 19.4.1999, David Kinney)

(Environmental Hydrology/ Global Warming, Pacific Ocean)

T11) Govt has ignored our reports: Geologists

(Times of India, 3.4.1999)

(Surface Water Hydrology, Garhwal)

T12) Tehri Dam proves sceptics wrong

(Times of India, 3.4.1999)

(Dam Hydrology, Garhwal)

T13) Jal Board accused of ignoring fresh water source in city

(Times of India, 30.3.1999)

(Water Management, New Delhi)

T14) No hike proposed in water rates

(Times of India, 30.3.1999)

(Water Management, New Delhi)

T15) Ahmedabad cries for a few drops more

(Times of India, 26.3.1999)

(Water Availability, Gujarat, Dharoi Dam)

T16) Water supply may run dry by 2010, says Dikshit

(Times of India, 25.3.1999, Staff Reporter)

(Water Crisis, New Delhi)

T17) Unfit for farming, fit for the thirsty?

(Times of India, 14.3.1999, Lalit Kumar)

(Water Quality, New Delhi)

T18) No surrender of claim on river waters: Bansi
(Times of India, 14.3.1999)
(Inter- state Basin Hydrology, Chandigarh)

Indian Express (IE)

IE1) Price of Water
(Indian Express, 20.12.1999)
(Potable Water, Delhi)

IE2) Kochi inventor rains water on parched islands
(Indian Express, 25.11.1999, Leela Menon)
(Urban Hydrology / Water Harvesting, Kerala,)

IE3) Where the drought has dug in
(Indian Express, 15.10.1999, Darshan Desai)
(Water Crisis / Ground Water Hydrology / Drought Management, Gujarat)

IE4) Human survival more important than environment: Minister
(Indian Express, 16.9.1999)
(Water Crisis / Environmental Hydrology, Gujarat (Rajkot))

IE5) Gujarat dams left with less than 10 % of water
(Indian Express, 10.9.1999)
(Water Crisis, Rajasthan)

IE6) A daughter of the soil, she turns arid land into forests
(Indian Express, 9.9.1999)
(Forest Hydrology)

IE7) More 'Dam' Facts - Few facts about big dams
(Indian Express, 6.9.1999)
(Dam Hydrology)

IE8) Where has monsoon gone?
(Indian Express, 31.8.1999, IMD)
(Surface Water Hydrology / Climatology, Delhi)

IE9) Water, not promises, will sway Gujarat voters
(Indian Express, 30.8.1999)

(Urban Hydrology, Surendranagar (Gujarat), Narmada / Dam River)

IE10) 'I feel I'm rinsing my mouth in a gutter'

(Indian Express, 12.8.1999)

(Water Quality, Maharashtra)

IE11) Wanted: Rain, and lots of it, at Ajwa dam

(Indian Express, 8.8.1999)

(Dam Hydrology, Gujarat, Ajwa Dam)

IE12) Damming the Dam

(Indian Express, 8.8.1999)

(Dam Hydrology, Gujarat & Rajasthan)

IE13) Saurashtra in grip of water shortage as monsoons fail

(Indian Express, 3.8.1999)

(Potable Water, Gujarat)

IE14) As last resort, Govt. to conduct experiments for artificial rain

(Indian Express, 3.8.1999)

(Artificial Rain, Gujarat)

IE15) An island marooned in monsoon waits for a clean Ganga plan

(Indian Express, 30.7.1999)

(Water Quality, Uttar Pradesh, Sota Island)

IE16) Rain harvesting scheme yet to take off in the Capital

(Indian Express, 29.7.1999)

(Water Harvesting, Delhi)

IE17) Boat capsizes kills 12 in Bihar floods

(Indian Express, 27.7.1999)

(Flood Hydrology, Bihar, Kosi River)

IE18) Water level falls at Bhakra dam

(Indian Express, 19.7.1999)

(Dam Hydrology / Surface Water Hydrology, Bhakra Dam)

IE19) AP puts off release of water to Chennai as Cong, TDP indulge in war of water

(Indian Express, 9.7.1999)

(Inter-basin Water Transfer, Andhra Pradesh, Kandaleru Reservoir)

4.0 FINANCIAL EXPRESS (FE)

FE 1) Project to tackle arsenic poisoning in Bengal

Arsenic poisoning from groundwater has become a serious problem in the Gangetic delta. High levels of arsenic, occurring naturally in geological formations, leads to a painful skin disease, arsenicosis. To combat the problem, the India Canada Environment Facility (ICEF), in collaboration with the All India Institute of Hygiene and Public Health (AIIPH), has initiated a project, worth Rs 9.58 crore, to test the presence of arsenic in groundwater in tube-wells and to provide arsenic-free drinking water in West Bengal.

Says K J Nath, Director, Department of Sanitary Engineering, AIIPH, Arsenic occurs naturally in groundwater sources at the depth of 80-800 meters in some districts of West Bengal. Under the project, Nath and his team plan to test over three lakh tube-wells in more than 400 villages spread over 68 blocks in six districts of the state. The institute has developed a simple field kit that can test the presence of arsenic from any source. A number of these kits will be distributed to nodal points among the 400 villages. The total project cost is pegged at Rs 9.5 crore, of which ICEF will contribute the lion's share, Rs 8.8 crore. The institute is also chipping in with a contribution of about Rs 40 lakh. The risk of arsenic contamination and its remedial measures will consist of the following:

- Standardized training technology and modules for different levels of personnel;
- 400 community groups to be formed mobilized and linked to Panchayats;
- 1,000 personnel to be trained in QA and QC based water testing and the project will test more than 10,000 water samples;
- 200 pond upgradation and 200 rainwater harvesting structures to be constructed;
- 400 awareness programs to be undertaken and 50 medical camps to be organized.

The Institute has also developed cost-effective and simple-to-run arsenic cleaning 'plant', which can provide safe drinking water to several villages. Nath says that local resource mobilization and maintenance holds the key to a long-term solution to this. A lot depends on the success of the project, which can then be used as a model in different parts of the delta, particularly in Bangladesh, where arsenic poisoning has taken epidemic proportions in some areas.

(Financial Express, 19.7.1999, All India Institute of Hygiene and Public Health, Calcutta)
(Water Quality/ Ground Water, West Bengal, -)

FE2) Pollution over Indian Ocean can affect monsoon

Widespread pollution observed recently over an area as large as the United

States in the Indian Ocean including the Bay of Bengal and the Arabian Sea could affect monsoon in the Indian subcontinent, says an expert.

A dense brownish haze of microscopic pollutant particles suspended in air (aerosols) in the Indian Ocean, discovered by an international team of researchers, could "affect monsoon parameters in the long run," emeritus scientist AP Mitra at the National Physical Laboratory (NPL) here, told PTI. "The extent of the effect, which depends on other factors like how aerosols react with clouds, is being studied," Mitra, who is heading the Indian team participating in the Indian Ocean experiment (INDOEX) involving the US, Europe, India, Mauritius and the Maldives, said.

The finding was the result of a six-week field study in February-March this year as part of the project which is coordinated by center for clouds, chemistry and climate (c4) at Scripps Institute of Oceanography (SIO) at the University of California.

(Financial Express, 16.6.1999, -)

(Indian Ocean, India, Arabian Sea & Bay of Bangal)

FE3) Canalways - Best bet to reduce pollution

Transport planners at the helm of policy-decision in New Delhi are somewhat obsessed with 13,000 km quadrilateral road linkage, disregarding the huge cost involved but are not adequately concerned about other cheaper, more Eco-friendly and energy-efficient alternatives, particularly in urban economic planning. In implementing the 13,000 km network, linking all the four mega-cities, New Delhi, Mumbai, Chennai and Calcutta, at least Rs 80,000 crore would be necessary.

Private sector is not coming up as expected or as the people at the highest policy-framing levels wanted the common people to assume until the other day. A four-lane expressway cost varies between Rs 6 crore and Rs 12 crore per km. Why should private investors be readily interested in such projects where the benefits will start accruing at least six years after the zero date on an average. The cost of debt serving is not only heavy but also difficult to adhere to, as realization of toll and other income is not to be an easy one.

Strangely enough, there are indeed cheaper, easy-to-source-funding and ecologically favorable alternatives like canalways in several big cities in India. Interestingly, in Europe, canalways are gaining importance afresh in the musings among urban planners and economists. Our top bureaucrats, ministers and even politicians pay visit to those European countries but seldom came back with such transport mode-ideas

which are appropriate for countries like India where liquidity crisis has assumed an acute form.

Calcuttans are likely to have a breakthrough in transport economies with canalways in the very first decade of the new millennium. If all goes well, gestation phase for a 42-km canalway project at an estimated cost of Rs 43 crore will start in January 2000. It is another addition to modernization of urban transport in the country. The other one is Metro Rail, a 17-km fast transit system, built mostly on indigenous strength and resources and has been operating very much satisfactorily, according to Japanese experts that visited Metro Rail a couple of years back. Cynics used to mock at the project when it was suffering from repeated cost escalations and time lags during the construction stage.

(Financial Express, 31.5.1999. -)

(Urban Hydrology, Mega-cities, India)

5.0 HINDUSTAN TIMES (HT)

HT1) Pollution panel serves closure notices on 650 industrial units, New Delhi

OVER 650 industries in the Capital have been served closure notices. The Delhi Pollution Control Committee has given notices to these water-polluting units for failing to install effluent treatment plants (ETPs).

The Supreme Court had directed all water-polluting units to install individual ETPs so that the pollution being caused due to the release of dangerous chemicals, such as zinc, could be controlled. The Supreme Court deadline for the installation of the ETPs came to an end on Nov. 1. However, the Delhi Pollution Control Committee has now served closure notices to these industrial units since they have not installed the ETPs.

(The Hindustan Times, 15.12.1999, Anju Sharma)

(Environment Hydrology / Water Pollution (Industrial), New Delhi)

HT2) Much of ground-water in Orissa untapped

Orissa has not realized its potential of ground-water resources for irrigation, Mr D K Chadha, chairman of Central Ground Water Board, has said. Although water is available for irrigating 4.5 million hectares of land, only 0.38 million hectares were being irrigated, leaving a great scope for the development of agriculture. Mr Chadha gave the example of Kalhandi district, where nearly 29,000 wells and 2,000 tubewells could have been dug in addition to the existing ones.

The state's vast underground water resources were not being tapped for raising crops. Water in most places so far remained untapped, except in a few pockets of Balasore such as Basta, Bhograi and Baliapal. In these pockets, the water level had gone down due to excess withdrawal of underground water for irrigation purposes. The board was planning Rs. one-crore project for recharging ground water in Balasore district. Against the peak utilization of 85 per cent of ground water, only 12 per cent in Kalahandi and 47 per cent in Balasore were being tapped. After the super cyclone, four drilling rigs were deployed to dig wells in Kakatpur, Astranga Kendrapara, Pattamundai, Cuttack and Banki to provide fresh water to the people. Ten sites had been identified for drilling.

(The Hindustan Times, 14.12. 1999)

(Ground Water Hydrology / Water Crisis, Orissa)

HT3) Guwahati plan to end drainage woes

The capital city, the gateway to the NorthEast, expects to overcome its cronic drainage problem within a couple of years. Thanks to an Rs 95.80 crore HUDCO financial project.

Besides improving two other main channels, Mora Bharalu and Hatigaon - the programme will entail construction of 15 truck and sub-trunk drains, three branch drains, improvement of Sorousala Beel (a pond in the heart of the city) as a storm water reservoir and a sluice structure at Bharalumukh, where the Bharalu channel meets the Brahmaputra.

(The Hindustan Times, 6.12.99)

(Urban Hydrology, Assam)

HT4) Water, water!

Two news items indicate the depressing prospect of water scarcity in the new millennium. First, India's richest temple at Tirupati is facing an unprecedented water shortage because of one bad monsoon. It has had to cut its daily consumption by half from nine million liters to 4.5 million liters. The number of devotees has been restricted and water has been rationed.

The International Food Policy Research Institute says India's water demand in the next 20 years will increase from over 600 billion cubic metres to 900 billion cubic metres. The per capita availability will fall to 1,700 cubic metres from today's 2,200 cubic metres, which is one-third less than the global average.

(The Hindustan Times, 5.12.1999)

(Water Availability)

HT5) Amritsar water crisis: Plans afoot to solve perennial problem

A unique scheme has been launched by the Shiromani Gurdwara Prabandhak Committee (SGPC) and the Central Ground Water Board. They will recharge the ever-depleting ground level of water in the city of Amritsar by using the waters of the "pool of nectar" that surrounds the historic Harmandir Sahib in the Golden Temple.

The recharged ground water would be soon used to augment the city's drinking water supply, which suffers from acute problems during the summer months. Over the past several years water problem in the city has been worsening with each passing year. The yearly depletion of the ground water table has been between 40 metres to 50

metres. The scheme involves repumping of the water from pool into the ground in order to recharge the underground water reservoir.

The scheme, which would become operational by next summer, would utilize the huge quantities of water that was earlier being drained off. In addition to this rainwater would also be used to recharge the ground water level by pumping it back into the ground through two specially designed injection wells.

(The Hindustan Times, 22.11.1999)

(Water Crisis / Water harvesting, Punjab (Amritsar))

HT6) Dam fails to solve farmers' problems

Despite The state government already spending crores of rupees on the Rupangarh Irrigation Project (Nimbark Dam), the people of the area have not got its full benefit after the lapse of seven years. 15 years back, the construction work on this dam was started and about 2100 acres land was to be covered for irrigation on the completion of the project. The dam is about 4.75 km long and has the filling capacity of 213 m cubic feet and the utility filling capacity is 210 m. cubic feet.

This dam was completed about seven years back. As per the plan, it was said that if the dam were filled to its capacity, the water level of the wells would go up in the vicinity of about 470 square km. But this did not happen. The dam was constructed in kacha area and that too the construction was of inferior quality. The dam was damaged immediately after its completion. About Rs 35 lakhs were invested on the repair of that area of the dam where the water was leaking. The total cost of the project was about Rs 3.70 crore at that time.

(The Hindustan Times, 14.11.1999)

(Dam Hydrology, Nimbark Dam)

HT7) Bad news from Punjab

One after another, farmers in different states are facing a falling water table. The latest name on the list is that of Punjab. This is bad news because Punjab is the 'grain bowl' of India and its receding water table will affect the productivity of crops.

Farmers there are digging deep in search of water and the acreage irrigated by underground water has increased alarmingly in recent years. Soon the farmers may have to dig deeper but at 15 metres, tubewells will be non-functional as warned by

several environmental agencies. At this rate the water table or aquifer might be completely depleted by 2025.

(The Hindustan Times, 11.11.1999)

(Ground Water Hydrology, Punjab)

HT8) Pollution choking Alwar

The district of Alwar has become one of the ten most polluted cities in India according to official sources. About 10 out of a 100 persons are prone to cancer and other disorders over here due to pollution or adulteration while diarrhoea and other communicable diseases are on the rise due to water pollution in the entire district.

Rapid industrialization, indiscriminate use of pesticides, deforestation, rapid increase in motor vehicles has polluted not only the soil, water and air but also the edibles over here. Indiscriminate use of preservatives and pesticides has affected the health of local residents here. Underground water level is falling rapidly due to visionless water management all over the district and hence most of the wells in the city and other areas have dried.

A few years back, Bahala village and its surrounding areas were effected badly due to acid rains caused by the chimney gases of the factories. The Hans sarover lake near this industrial area and its nearby lands have been polluted and made barren due to the polluted industrial wastes from this pocket.

(The Hindustan Times, 1.11.1999)

(Water Pollution, Rajasthan)

HT9) Govt. declares 19,580 villages in Rajasthan as drought-hit

Government has declared 19,580 villages in 18 districts of Rajasthan as drought hit areas. It has been decided to commence relief works within 24 hours. Due to failure of the monsoon, most of the districts are reeling under the drought.

(The Hindustan Times, 01.10.1999)

(Drought Management, Rajasthan)

HT10) Severe Water Crisis Feared in Mussoorie

The queen of hills, Mussoorie, is facing a grim future on waterfront. In the past decade the area witnessed a construction boom and the consequent overtapping of natural resources caused serious water pollution and its scarcity. The proposed

schemes by the Government to augment the water supply situation in Mussoorie seem inadequate. The Supreme Court Monitoring Committee (SCMC), which has been formed by the apex court to study the ecological degradation of the hill resort, in its latest study has projected a grim scenario on the availability of water in the coming years.

Mussoorie, which was once regarded as a health resort, was known for its pure drinking water and unpolluted springs and brooklet. It is still fed by 14 springs and three brooklet flowing in its vicinity. But over-exploitation and pollution coupled with unbridled construction activity have caused the drying up of some of the water sources and decline in the carrying capacity of these aquifers.

It was in 1909, that the first hydroelectric power station, Gagoi Power House, was built by Lt. Col. W.W.Bell. It was built to provide electricity and to pump water upward to Mussoorie town. It was for the first time that water was pumped to a height of 1700 feet, which was the highest in Asia at that time. The water was pumped from Murray springs below Mussoorie town. The water quality was excellent and the spring was tapped so deep that its increased discharge was only felt when it rained more than 30 inches in the catchment areas. But, over the years, due to indifference and increased burden of ever-growing population, deep tapping of the water resources, both its quality and quantity declined.

The state government has a proposal to build three overhead tanks at different places with a capacity of 90 lakh litres but it would take time to complete the project. Moreover, the proposal of the Government to pump water to these tanks from Dhobighat and Kairkuli water springs has already run into rough weather. The villagers have started opposing the move on the ground that there would be scarcity of water for drinking and agricultural purposes, if these resources were tapped for urban consumption.

(The Hindustan Times, 29.9.1999, Shamim)

(Water Crisis, U.P., Springs)

HT11) Patel Govt not to give water to TN

Karnataka today firmly rejected the Centre's plea to release water from the Cauvery to Tamil Nadu. The grounds stated were that the state was facing a severe shortage in its reservoirs. Karnataka Irrigation Minister said there were just 76 TMCs (Thousand million cubic fts.) of water in the state's four reservoirs as against 100 TMC last year. The failure of the southwest monsoon had affected 75 taluks in Karnataka's

Cauvery belt. These 75 taluks had experienced a dry spell continuously for a period of four weeks. Some of these had suffered dry spells of eight weeks at a stretch. Some 61 taluks had received moderately deficient rainfall while nine more had witnessed extreme deficiency.

Stating that there was no problem in Tamil Nadu, it was Karnataka, which faced the threat of withering crops due to the shortage of water. Last year, Karnataka had released 257 TMC of water as against the tribunal stipulated minimum of 205 TMC water per year, he said. Mr Nage Gowda said rains were expected in a week or two and by the first week of October, the situation would turn better in both states.

(The Hindustan Times, 22.9.1999)

(Inter-basin water Transfer, Karnataka & Tamil Nadu, -)

HT12) Orissa in the grip of drought

More than one-third of Orissa is reeling under drought and the government has initiated steps to combat the situation. Most of the parts in the State have not received rain during the past many days. This has resulted in complete damage to the kharif crop in four districts and partial damage to the same crop in another seven districts. Balasore, Mayurbhanj, Keonjhar and Bolanghir are the districts where severe drought-like situation is prevailing. Deoghar, Kendrapada, Sambalpur, Sundergarh and Sonepur are those districts where the crop has been damaged partially.

(The Hindustan Times, 22.8.99)

(Drought Management, Bhubaneswar, Orissa)

HT13) Poisonous water

Water is everywhere but not any drop to drink, has long been the reality in a cluster of villages in Khurda tehsil of Orissa where people are being crippled due to high levels of fluoride in the drinking water. Most people here do not live beyond the age of forty. It is quite likely that the fluoride in the water is due to natural sources brought on by the excessive pumping of subterranean water resulting in the accumulation of toxins such as fluoride. There is even a stream in the Yamuna, which brings in high contents of toxins but it gets diluted by the other streams.

Perhaps in Khurda tehsil there is not enough water for this to happen. Actually, the problem first surfaced in West Bengal in the late eighties when in a bid to control malaria, the government sank handpumps so that surface water bodies could be sprayed with pesticides. As it happened the malaria epidemic was brought under control

but thousands fell victim to arsenic poisoning caused by the water they were drinking. Subsequently, the problem was also noticed in Bangladesh and the fact that a similar problem is now being reported from Orissa has prompted experts to believe that it could well be due to the geological composition of the Indo-Gangetic plain. It could also be due to indiscriminate withdrawal of water for agriculture, which causes the intrusion of saline water, especially in coastal areas into the subterranean reservoirs.

If it is due to geological reasons alternate sources of water must be made available to the people. Communities must be made water conscious and involved in the planning and management of water, traditional technologies for harvesting water should be adopted and municipal bodies encouraged constructing structures for harvesting and recharging surplus monsoon run-off due to urbanisation. It is estimated that two-thirds of the country's fresh water is being lost annually due to evaporation and run-off to the sea. According to one study, excessive fluoride, iron nitrate and arsenic or excessive salinity in drinking water affects about 44 million people in India.

(The Hindustan Times, 19. 8. 1999)

(Water Quality, Orissa. -)

HT14) Unsafe drinking water cripples Orissa villagers

A Cluster of villages in khurda tahasil in Orissa is facing the threat of extinction with the villagers becoming crippled and dying from toxins in the drinking water. The people of Singpur, Balasing, Balasinghpatna and Pallibalasingh are struggling for their lives for many years but the government and the political leaders have turned a deaf ear to their misery.

High level of fluoride content in the ground water crippled many residents of the area before they attained the age of forty. The health condition of these villagers was precarious, with 90% of the population in the area suffering from senility at the age of 49. While some of them were suffering from astheria and muscular atrophy, others were struggling with head myalgia. The villagers mostly depended upon water from local tanks and tubewells for all purposes and the study had revealed that the ground water contained high degree of fluoride, much more than the tolerable limit of four milligrams per litre. The high content of fluoride in water has a toxic effect on the blood and bones.

Central Ground Water Board, which collected water samples of the area for study, found that the fluoride contents in them was as high as 8.2 Mg per litre. In one village it had gone up to 13.2 Mg per litre. The long-term intake of fluoride concentration had caused skeletal fluorosis, crippling the victims. So severe was the problem that

fluoride ingested through drinking water was deposited in blood plasmas causing calcification of blood vessels, and finally of bone joints. During the reappraisal hydrogeological survey in 1996, a high concentration of fluoride was found in the ground water in Balasingi and Singipur in Bolagarh block.

(The Hindustan Times, 15.8.1999)

(Water Quality/ Ground Water, Orissa)

HT15) Yamuna poisoned, Delhi style

Revered as a goddess, the river Yamuna is the lifeline of Delhi, helping to quenching 60 per cent of the Capital's thirst. But today it also receives 60 per cent of untreated domestic sewage not to mention industrial effluents, fly ash and other chemicals that the river is supposed to cleanse. As environmentalists dish out such frightful figures, equally alarmed authorities speak of feasibility studies to restore the river suggesting among other things allowing free flow of the river that has self-cleansing properties.

From entering Delhi at Palla village near Wazirabad to leaving it at Gookhla, Yamuna is constantly fed by drains carrying domestic and industrial waste. Not only its water is unsafe for drinking but it also has no scope for sustaining any kind of aquatic wildlife. Concrete steps need to be taken fast otherwise we will lose the river forever, says Sureshwar D. Sinha of 'Pani Morcha', an NGO that has filed a PIL in the Supreme Court. There has been no flow of water in the river since the mid-80s.

(The Hindustan Times, 16.7.1999)

(Water Quality, Delhi, Yamuna River)

HT16) As Indravati dries up, problems flood Bastar

The lifeline of Bastar - the Indravati River - is fast drying up. And, consequently, not only are the residents facing a parched future but also other socio-economic crises. Though the river, which was known as Mandakini in ancient times, originates from Thuamel of Kalahandi district in Orissa, its presence is felt more in Bastar (Madhya Pradesh) owing to its being more than double its length here than in Orissa. The distance travelled by the river in Orissa and M-P is 164 km and 352 km, respectively, before it culminates in the Godavari River at Bhopalpatnam in Bastar.

The villagers of Bastar revealed that the water level of the river had receded alarmingly, from 20 feet to being merely knee-deep now. This downward trend can be attributed to the construction of a number of dams over the river in Orissa in the recent

past, which has led to a reversal in the flow-pattern of Indravati River. Tthe dams near the Nalla in Orissa have resulted in heavy siltation, forcing the river to change course.

Since the constricted Nalla does not have the depth to retain the water that flows from Indravati River, a flood-like situation has developed in the 10-km periphery that forms the common boundary between Orissa and M-P. In stark contrast, a drought-like condition is prevalent in the Bastar region.

(The Hindustan Times, 7.7.1999)

(Surface Water Hydrology, Orissa & Madhya Pradesh, Indravati river)

HT17) Pushkar lake pollution

For Hindus throughout the world, this lake is religiously important so desilting operations must be done on an extensive scale and there should be effective stoppage of silt from the neighbouring mountains.

Prompt action must be taken to remove the dead fish floating on the water surface of the lake and prevent the recurrence of the same in future. The initial depth of the water over 30 feet has come to 10 feet due to silting. The Government should save the lake from further pollution.

(The Hindustan Times, 17.6.1999)

(Lake Hydrology, Rajasthan)

HT18) Rajasthan, M.P. to share Chambal-Betwa waters

The Chief Ministers of Madhya Pradesh and Rajasthan today agreed to resolve the inter-State issues, which were hanging fire since the last 10 years. Both States amicably settled the important issue of utilisation of 12 million-acre feet (Maf) of water in the Chambal - Betwa river basin. This would pave the way for the establishment of about 18 irrigation projects in Rajasthan.

(The Hindustan Times, 4.6.1999, K.S.Tomar)

(Inter-Basin Water Transfer, Chambal – Betwa River Basin, Rajasthan & M.P.)

HT19) M-P river heavily polluted: Panel

The Madhya Pradesh Assembly's Petition Committee has been informed by NEERI, Nagpur that the water, polluted by a local distillery is not even suitable for irrigation, let alone drinking.

Betwa is a lifeline of thousands of villagers of Vidisha and Raisen districts in the neighbourhood of Bhopal. The colour, low PH, high conductivity and high concentration of TDS, BOD (biochemical oxygen demand) and sulphates of water samples of Betwa river are indicative of pollution from the discharge of distillery wastewater. The water quality of Betwa River is far inferior to the requirement even for irrigation purposes as indicated by physico-chemical characteristics.

(The Hindustan Times, 30.5.1999)

(Water Quality, Madhya Pradesh, Betwa River)

HT20) Malda is in grip of arsenic poisoning

About seven lakh persons in this district are in the trap of arsenic poisoning. In fact, the menace is also widespread in Murshidabad, Nadia, North and South Parganas districts, all on the east bank of the Ganges river. The State Government admits that as many as 70 blocks in eight districts suffer from arsenic poisoning through potable water.

According to an expert, treatment of water with easily available alum and bleaching powder is the easy and cheapest method to remove the arsenic from the potable water. The affected population may be educated in this regard. The problem is more prevalent in rural areas where majority of the population do not get high protein diet, making them vulnerable to arsenic poisoning.

The experts admitted that excessive withdrawal of water from the land has led to the problem. However, they pleaded ignorance on the fact that the districts in Bihar, on the West Side of river Ganges are free from this menace which is assuming ramification in the affected Bengal districts. For the past three decades, water from umpteen wells sunk into the alluvium of the Ganges delta, without any clay barrier to contain impurities in water, has been slowly poisoning the people, villagers in particular, with naturally occurring arsenic. Now thousands of villagers are being diagnosed with the debilitating marks of arsenic poisoning on their skins.

Experts have feigned ignorance about the phenomenon that water is usually available only on one side of rivers and that is why most of the cities developed on one side of the river in the course of history. With the increase in population, the other sides too started having human settlements and in the process, numerous problems come including that of potable water.

The Public Health Engineering Department officials, who are engaged in fighting the arsenic poisoning, advise people to switch over to surface water sources- the very

sources abandoned a generation ago to halt the epidemic of frequently occurring cholera. The State Government launched an ambitious scheme to contain arsenic poisoning of potable water by installing treatment plants.

(The Hindustan Times. 28.5.1999, Anil Maheshwari)

(Water Quality, West Bengal (Malda))

HT21) Large population yet to get drinking water

Only 5 per cent of the total water resources available in the country are required for drinking and domestic use. The total 'Not-Covered' (NC) habitations with regard to potable water supply stood at 49,374 as on Dec. 31, 1997, according to sources in the Ministry of Rural Development. NC habitations are those where there is no source of potable water provided by the government within a radius of 1.6 km.

According to sources in the ministry, states where NC habitations are fairly large are Assam with 9517 habitations Rajasthan with 9784, Punjab with 6229, Orissa with 2707, Bihar with 3403, Gujarat with 1421 Himachal Pradesh with 4737, Jammu and Kashmir with 3063 Karnataka with 2304, Kerala with 1145 and Meghalaya with 1191. The government norm for providing drinking water to villages is at least 40 litres of safe drinking water per capita per day (LPCD) for human beings, which is supposed to take care of all their needs like ablutions, drinking, washing and cooking.

Those habitations which get less than 40 LPCD are 'Partially Covered' (PC) habitations. The country had 3,54,305 habitations, which were partially covered as on Dec. 31, 1997. Andhra Pradesh (29071) Assam (23698), Bihar (17112), Himachal Pradesh (41133) Karnataka (15973), Madhya Pradesh (21057) UP (53725) West Bengal (25039), Tamil Nadu (27543), Rajasthan (41672), Orissa (16749), Maharashtra (37436) and Meghalaya (1692) are some states with several PC habitations. As on Dec. 31, 1997, the country had 14,30,663 habitations of which 49,374 were not covered, 3,54,305 were partially covered, and 1,026,984 were fully covered.

The provision of safe drinking water is primarily the responsibility of the state governments, and the Central Government supplements their efforts in providing drinking water systems like hand pumps, tube wells and regional piped water schemes. Different reasons are cited for the acute shortage of drinking water in various parts of the country. In many places, it is a temporary affair with water sources drying up during the summer months. But almost all over the country, sources go dry owing to a fall in the ground water table.

About 135 blocks in the country have been identified as suffering from over extraction due to irrigation. Mostly hand pumps dug to depths of 30 to 35 metres go dry. But at times even bore wells, dug to depths of 100 metres or more run out of water. In order to deal with the problem of the rapidly diminishing ground-water level in the country the Ministry of Rural Development advocated the need for a model Bill. This document has been prepared and circulated by the Ministry of Water Resources to regulate ground-water use. The Bill seeks to set up a groundwater authority to notify areas for control and regulation of ground water development, register existing and new users grant permits to extract ground water looking at the purpose for which water would be used.

(The Hindustan Times, 22.5.1999, Satyen Mohapatra)
(Water Availability, India)

HT22) 100-metre breach in Bhakra main canal

The Army was called late last night to plug a 100 metre-wide breach in the Bhakra Main Line canal in Shatrana area of Patiala district. The breach has so far submerged nearly 3,000 acres of land in four to five feet of water. However, no loss of life was reported. Apart from this wide breach, there were several small breaches in the main line at several other places. While there was no spillover from the breaches at the higher reaches, at least two small breaches of about eight feet wide were plugged before much damage was done.

(The Hindustan Times, 14.05.1999)
(Surface Water Hydrology / Dam Hydrology, Punjab, Bhakra Canal)

HT23) Our people, our world - Of poisoned water

Almost 70 million people in a 500-km stretch of Bangladesh and some districts of West Bengal are drinking water laced with arsenic, which causes skin cancer, kidney and liver complications, respiratory diseases and in some cases, death. The poison occurs through weathering of rocks or smelting of ores. Arsenic sulphides remain inert as long as they are submerged in groundwater. However, because of millions of tubewells dug in the region in the 1970s, aquifers have fallen, exposing the sulphides to oxygen. Once oxidized, sulphides become soluble.

To avert a catastrophe, scientists advise, groundwater pumping must stop and surface water should be used for households, livestock and irrigation. Ironically, a generation back, people abandoned surface water to halt cholera epidemics.

Volunteer Australian scientists are working on an absorbent tube containing specially modified clay which, when dropped in a bucket of water, absorbs the arsenic, rendering the water safe for drinking in an hour or so. Also, in areas where the water is rich in iron, scientists advocate storage tanks. For iron and arsenic bind together and sink to the bottom, leaving the water pure enough for use.

It is not easy to get people to switch back to surface water for, 70 per cent of the population in this region is illiterate. There is also paucity of resources to build such tanks. And it is not also certain in what different ways people are ingesting arsenic -- through drinking water, or milk, meat, crops and skin exposure.

(The Hindustan Times, 9.5.1999, Shree Venkatram)
(Water Quality, Bangladesh and West Bengal)

HT24) Contamination remains a crucial problem

Apart from generating enough potable water for the Capital's consumption, one of the most crucial issues before the Delhi Jal Board (DJB) is water contamination and problems during transmission.

The transmission and distribution losses amount to 45 per cent of the total purified and treated water. While the pipeline losses or the actual water lost during transmission is just about 14 per cent, the unauthorized connections increase the losses manifold. The mixing of treated water with the underground sewage is the most common and hazardous problem during transportation. Both the water and the sewer lines are laid side by side. In most parts of the city, the sewer pipes are 45 years old and have not been de-silted. The water pipelines are corroded in most areas and sewage gets mixed with the water in the nearby pipelines. Consequently, the water is highly contaminated.

(The Hindustan Times, 30.4. 1999)
(Potable Water / Water Management, Delhi)

HT25) Ground water - raw & polluted, yet consumed

A notice put out by the Central Ground Water Board, Ministry of Water Resources, on April 25 identified Vasant Kunj and Vasant Vihar blocks in Mehrauli as critical areas for ground water depletion and prohibited any activity for extraction of ground water in these areas.

The areas surrounding the Najafgarh drain and large pockets in East Delhi are

in a similar state. Recent studies carried out by various agencies, including the Central Pollution Control Board and the Central Ground Water Board also point out major depletion of the water table in Delhi due to over-exploitation. The more depleted the water table, the higher is the rate of contamination.

Even the Delhi Jal Board concedes that one-third of Delhi's ground water is polluted and unfit for consumption. This ground water caters to the requirements of over 40 per cent of the population. The rest is supplied the water treated at the four DJB treatment plants. For all these plants, except Bhagirathi, raw water is supplied by the Yamuna. The pollution level of the Yamuna, the source of 70 per cent of the Capital's water supply, beyond Yamuna Nagar makes it unfit for bathing. The Western Yamuna Canal, which meets 35 per cent of the city's raw water demand, crosses Yamuna Nagar, Karnal, before reaching the Haiderpur plant.

Apart from receiving water from Karnal, Panipat and Sonapat, chemical and industrial wastes from the industries in these towns are discharged into the canal. The wastes from the Panipat sugar mill and distillery and the PWD drain fall into a disused canal, with a makeshift dam on it. Effluents flow over this dam several times a year resulting in an increase in the Western Yamuna Canal's pollution load. According to a CPCB inspection report, the dam had 100,000 cubic metres of effluents.

Pesticides, heavy metals and hazardous chemicals are present in the raw water, which the Board does not have facilities to treat. Even in the distribution of the treated water, there are frequent complaints about mixing of water and sewer lines. In the Walled city, Central and West Delhi, such complaints are routine.

The DJB officials maintain that they will install 2,000 tubewells by this month-end, but there are serious doubts about this project meeting the requirements. The Central Ground Water Board estimates that there are nearly two lakh tubewells in Delhi. This means that the water demand-supply gap in Delhi is bridged by extracting ground water. No study can indicate how many tubewells are safe. The Board says warnings have been issued, especially in SouthWest, North and West Delhi, but till the people have an option, they will use this water even for drinking.

(The Hindustan Times, 29.4.1999)

(Ground Water / Water Quality, New Delhi)

HT26) Punjab blamed for canal breach

It was primarily due to the callous approach adopted by the irrigation department

of Punjab, which led to the breach in the joint bank of the Rajasthan and Sirhind feeders thereby delaying the release of the water to Rajasthan by seven days.

Hundreds of villages in Rajasthan may face shortage of drinking water as it would take another one week for the stream of water to reach its destination in the State. The Punjab Irrigation Department may offer any explanation for the breach in the joint bank, but experts feel that 1,900 cusecs water was released on April 19, which created pressure on the weak point near joint bank and washed it away. No vigil was kept when the water was released, which might have been responsible for the delay in detecting the leakage. The pressure of water was very high which broke the wall near Bhal village in Punjab.

The Rajasthan Government had suggested to Punjab to release the water in stages, which would minimise the chances of a canal breach at any point of the 200-km stretch.

(The Hindustan Times, 26.4. 999)

(Inter-basin water transfer, Punjab and Rajasthan, Sirhind Canal and Rajasthan canal)

HT27) Spectre of famine stalks Tripura, Agartala

The spectre of near famine is stalking Tripura with drinking water sources drying up everywhere in the hilly and remote areas of the state. State Agriculture Department director told that such dry spell was being witnessed for the first time during the past 15 years. More than 31 per cent "Boro crops" and 26 percent seasonal vegetables had already been damaged due to lack of water and rain, he pointed out. Mr Debbarma said crops worth more than Rs 33 crore had been damaged in the entire state while the Boro crops could not be cultivated in 8,600 hectares. If there were no rainfall in the state in the next 15 to 20 days, the situation would become critical, he said. Outbreaks of enteric diseases in an epidemic form are feared in the hills and remote areas as the hill people had been forced to drink unhygienic water.

Since December last year only 69.8 mm rainfall had been recorded against 571.30 mm during the corresponding period last year, the sources said adding that during December last year and January and February this year no rainfall was recorded in the state.

(Hindustan Times, 24.4.99. UNI)

(Surface Water Hydrology / Water Crisis, Tripura, Agartala)

HT28) Rajasthan hit by breach in canal, Sriganganagar

A breach in the joint bank of the Indira Gandhi Canal and the Sirhind Feeder Canal near Lal Bhai village in the Punjab area has compounded the misery of the already parched regions in Rajasthan.

So severe was the breach that it resulted in a 200-foot-stretch of bank of the IG canal being washed away. "The breach is very wide. The reported reason for the breach was "piping action" (continuous water seepage from the Sirhind Canal to the Indira Gandhi Canal). It has led to a loss of approximately Rs.50 lakh.

(The Hindustan Times, 24. 4.1999)

(Surface Water Hydrology, Rajasthan, IG canal, Sirhind Feeder Canal)

HT29) Karnataka approaches SC over Almatti issue

The Karnataka Government today sought permission from the Supreme Court to impound 155 TMC feet water at Almatti reservoir on Krishna river without raising the solid crest level of the dam beyond 509 metres under any kind of supervision.

(The Hindustan Times, 23.4.99)

(Inter-basin Water Transfer, Almatti Reservoir, Krishna River)

HT30) Sick Ganga struggles to survive in Bihar

The once-mighty Ganges river has been reduced to no more than a small stream in this city. The bed of the holy river is fast drying up. It has, in fact, moved about 500 metres from the original riverfront.

The low discharge of water from the upper riparian states and drying up of the catchment area has contributed to this. The riparian states now consume more river water than 10 years ago. That has been aggravated by lack of planning in the catchment area of the Ganges and its tributaries. The Ganges shows signs of chronic illness over a 400-km stretch between Buxar and Bhagalpur as it passes through Bihar. It has receded by 200 metres to 500 metres along that stretch.

Munger, for one, is threatened by a drinking water crisis. The Kasturba Water Works supplies drinking water in the municipal area after drawing raw water from the river. But the river is barely knee-deep at the Kastharni Ghat intake station from where the water is drawn. The mighty river has been reduced to half. Move along the river to Bhagalpur and the situation is no better, it is just a stream. The Ganges has shrunk most between Ghogha and Trimuhan. There, too, the ghats attract fewer bathers.

The State Government had mooted a plan for the development of a catchment area for the main rivers and their tributaries. This should be done in a way that Bihar could use the waters of the Bagmati, Gandak and Kosi for development and dredging activities. Green activists of the Ganga Mukti Andolan and the Ganga Diara Mukti attribute the drying up to the indiscriminate construction of dams and barrages on the river. The government needed to take immediate steps to remedy the situation.

(The Hindustan Times, 20.4.1999)

(Surface Water Hydrology, Bihar, Ganga River)

HT31) Water proves too much for "grain basket" Suratgarh (Sriganganagar)

More than 75 villages of Hanumangarh and Sriganganagar, that once comprised the so-called "grain basket" of the State, are fast becoming uninhabitable. Serious waterlogging has taken its toll of the area and those who had toiled to turn it into fertile land are now thinking of migrating to other areas. Incessant rains accompanied by waterlogging has left their houses and crop damaged and broken their spirits.

Waterlogging has brought with a serious drinking water problem. The problem of waterlogging is so acute that wells in some villages are overflowing. Continuous 'seepage' from the Canal and the Ghaggar River that pass through the region has caused the water table to rise. Breaches started appearing in brinks of the reservoir.

(The Hindustan Times, 11.4.1999)

(Ground Water Hydrology / Water Logging, Gujarat, Ghaggar River)

HT32) MCD responsible for 85 p. c. water pollution

The Comptroller and Auditor General (CAG) in his report has maintained that the water supply in Delhi was unsafe for drinking and that the Municipal Corporation of Delhi (MCD) alone was responsible for 85 per cent of the water pollution and that it was discharging 200 million gallons of untreated water into the Yamuna every day.

The CAG has expressed concern over the fact that the construction of 15 common effluent treatment plants for 28 industrial estates which were scheduled to be completed by June, 1998 is yet to be taken up resulting in the continued discharge of untreated industrial waste in the drains.

(The Hindustan Times, 9.4.1999)

(Water Pollution, Delhi, Yamuna)

HT33) Rising water tables threaten Haryana economy

About 50 per cent of agricultural lands in Haryana have been affected by rising water tables, of which approximately 10 percent are severely waterlogged. This spells trouble for the agriculture-based economy of the state where crop production is already showing signs of stagnation.

Having targeted canal irrigation as the main reason for the increasing problem, a high-level expert committee, formed by the state government, has advocated reduction in canal water supply by 25 per cent between mid-July and September and from December to February in the districts of Hisar, Sirsa, Rohtak and Jind. Once considered as a boon for the farmers, boosting agricultural production manifold since the sixties, the network of canals in Haryana has led to a serious hydrological imbalance in the state.

In the last three decades, water table in the canal-irrigated areas has risen at the rate of 10 to 30 cm annually and nearly 473 hectares has already come within three metres from the ground surface. It is expected that in the next three decades the area under critical water table depth will increase four folds if no curative measures are taken. All this has led to experts doubting the sustainability of irrigated agriculture in the state, more so as Haryana has unfavourable geohydrological conditions.

One of the major recommendations of the committee, therefore, is reduction of canal irrigation in the affected areas and encouraging the farmers to use ground water in conjunction with canal water for irrigation. Propagation of modern irrigation systems such as drip and sprinkler has also been advocated. Curative measures proposed by the committee to reclaim the badly affected lands include installation of surface and sub-surface drainage systems in areas where the water table has already come within 1.5 meters from the surface.

(The Hindustan Times, 8.4.1999)

(Ground water / Waterlogging, Haryana)

6.0 DECCAN HERALD (DH)

DH1) Groundwater level dips in 72 taluks

An alarming three lakh wells have dried up in about 72 taluks of the State, including Bangalore North and South, causing considerable depletion of groundwater levels, a recent study conducted by the Department of Mines and Geology (Groundwater Survey Unit), Government of Karnataka has revealed.

The department has suggested to the State government to undertake construction of artificial recharge structures in the affected taluks of the state as a method to sustain the groundwater resources. The exploitation of groundwater in Bangalore North and South, Anekal, Kolar is 85 % and above. Out of the current population of over 50 million in the state, the rural and urban population, who are dependent on ground water for their domestic water requirement is about 43 million. Due to close spacing of the drinking and irrigation borewells in the villages, drinking wells are getting dried up every year.

Bangalore City has about one lakh borewells leading to considerable reduction in groundwater levels. The minimum depth to sink a borewell is also increasing. While it was about 120 feet in 1985, the average level currently is 200-300 feet. The depth level varies in different areas, he added. It is time the Government initiated steps to control and regulate the exploitation of groundwater, the official added.

There is need to select places for ground water recharging, to improve the underground water table. Water conservation measures like rain water harvesting should be taken up wherever possible, especially in multi-storied housing complexes and industrial establishments to meet the increasing demand for water. Further, reuse of waste water after treatment, controlling the use of underground water and protecting and maintaining the existing lakes in the City will help in meeting the future demands.

(Deccan Herald, 11.12.1999)

(Ground Water Hydrology, Karnataka)

DH2) Groundwater in Mysore contaminated

"Don't just boil your drinking water, but get it tested", the Department of Mines and Geology has warned people living in certain areas of Mysore. The Department which began its chemical analysis of groundwater in Mysore during 1992-1993 and has been constantly monitoring its quality since then, has found a high concentration of nitrates and organic chemicals in the groundwater particularly in Mysore South, Rajendranagar, Kesare, Kyathamaranahalli, Paduvaralli and Hinkal.

The public which depends on groundwater particularly in J P Nagar, Hinkal, Bannimantap Extension, Kesare and Rajendranagar, Kyathamaraiahalli and its surrounding areas, should get their water analysed before using it. The report also said, "avoid selecting borewell sites near septic tanks, cesspools and landfills containing solid waste". In polluted areas, locate borewells only on the upgradient of the source of pollution. The reports also told municipal authorities to ensure that water from borewells meant for drinking should meet Indian Standards specifications. It also advised mixing of good water with polluted water to reduce the effect of chemical contaminants. The report says that underground water had been contaminated by the disposal of solid and liquid wastes in an uncontrolled manner. 'Most landfills in Mysore are simply refuse dumps (e.g. Municipal land fills at Nanjangud Road) and rainwater moving through these landfills pollutes the groundwater.

The concentrations of TDS (total dissolved solids), calcium and nitrate are above permissible limits for drinking purposes in Mysore's groundwater. The average TDS in Mysore's groundwater is 700 ppm. The desirable limit is up to 500 ppm. The Department has found that 66 samples (78 per cent) had more TDS than permissible limits. The hardness of water is also excessive (over 600 ppm) in areas like Hinakal, Mysore south, Bannimantap and Kyathamaraiahalli.

While the desirable limit for calcium is 200 ppm (parts per million) more than 200 ppm was found in parts of Bannimantap Extension and Rajendranagar. In the case of Magnesium (desirable limit being 100 ppm) more than 100 ppm was found in parts of Mysore South and Hebbal Extension. Total hardness for water should be only 300 ppm but was more than 600 ppm in Ashokapuram, Hinkal, Kyathamaraiahalli and Bannimantap Extension.

The detailed study has shown that Mysore gets 49 per cent of its water from groundwater sources. The report has urgently recommended that groundwater users and municipal authorities should follow preventive measures to tackle groundwater pollution to avoid further groundwater degradation. It also recommended that discharging of liquid wastes into tanks like Kukkarahalli and Karanji tanks should be avoided. The report also called for periodic maintenance to avoid leakage from underground and open surface drain systems, provision of underground sewerage systems where there are soakpits and cesspools, avoiding landfills of solid waste near drinking water wells, and half-yearly maintenance and cleaning of borewells and storage tanks etc. Pipes made of non-corrosive materials should be used for water supply systems from borewells to consuming points where groundwater had a corrosive ratio of more than one, it said. Incidentally, members of the public can bring their drinking

water samples to the Department's laboratory for chemical analysis.

(Deccan Herald, 9.8.1999)

(Water Pollution / Ground Water, Mysore, -)

DH3) Hemavathi river in full flow; reservoir gates opened

After a gap of five years, the river Hemavathi is once again flowing full due to good rains in the catchment areas and also the good inflow from the river's tributaries. The Hemavathi reservoir here recorded 35 tmc of stored water as against a capacity of 37.10 tmc.

The river, which originates in Ballarayanadurga of Mudigere taluk in Chikamagalur district, has received good inflow from its tributaries. By the end of July, the reservoir had received about 20-26,000 cusecs of water as a result of which it was rendered near full on August one. The daily inflow now is about 9,000 cusecs.

Six crest gates of the reservoir have been opened about one foot and the outflow into the river and canals is said to be around 8,040 cusecs. The water body is spread over a total area of 22,000 acres and water is being provided to Tumkur and Mandya districts from the left bank canal. The reservoir, which was constructed to provide irrigational water to 6.5 lakh acres of land, presently provides water to 2,65,079 acres.

(Deccan Herald, 5.8.1999)

(Surface Water Hydrology, Karnataka, Hemavati River)

DH4) Cabinet cancels township project near reservoir

The State Cabinet of Karnataka today decided to cancel the permission given by the previous Congress Government for the DLF township project on the banks of Thippagondanahalli reservoir as it posed pollution threat to the reservoir. The decision taken at a high-level meeting recently came before the Cabinet for approval. The Cabinet is also understood to have decided not to allow any other similar projects on the banks of the reservoir and the river Arkavathi. The Cabinet also cleared the Ground Water Regulation Bill, which would be introduced during the ongoing session of the legislature. The bill provides for maintaining a mandatory 1500 feet distance between two borewells.

(Deccan Herald, 1.7.1999)

(Urban Hydrology, India, -)

7.0 HINDU (H)

H1) India's first urban infrastructure fund

The funding and development subsidiary of the Feedback Ventures group, will be launching India's first urban infrastructure fund in April next year. The Rs. 100 crore funds are expected to catalyse urban infrastructure projects worth Rs. 1500 - 2000 crores.

(Hindu, 23.12.1999)

(Urban Hydrology, India)

H2) Watershed Project in Uttarakhand

Dehradun, Strengthening the overall process of watershed development in the Uttarakhand region is one of the major components of the programme for western Himalayas being supported by the Department for International Development. With The support of the DIED, the society for promotion of wastelands development (SPWD), an NGO, will take up watershed development projects as a model building exercise in the Himalayas, according to Mr. Pankaj Kumar, programme officer, SPWD, DehraDun.

(Hindu, 21.12.1999)

(Watershed Hydrology, U.P. (Uttarakhand))

H3) 3 Districts chosen for water project

With a distinct emphasis on people's participation, three districts in Tamil Nadu have been chosen by the Centre for a Rs. 230 crore project to strengthen the drinking water supply network. While 90% of the cost is met by the Centre, the balance is generated from the community for the project, which will benefit 28 lakh people in 3,100 habitations in Coimbatore, Vellore and Cuddalore districts. The selection of the three districts is based on their having serious problems of water availability, quality and also taking into account the possibility of water demand going up in the coming years.

The agency which has selected the three districts for implementing the scheme on an experimental basis is the Rajiv Gandhi National Drinking Water Mission, a body functioning under the Union Rural Development Ministry.

(Hindu, 18.12.1999, T. Ramakrishnan)

(Water Management, Tamil Nadu)

H4) Dams and Drinking Water

There is so much misinformation going around about the technology of dams that it is worth recalling some basic facts concerning wastage of water. Fact no. 1 - Other

things being equal, doubling the height of a dam increases the volume of water stored eight times and power potential sixteen times. Alternately, for any given amount of storage, the higher the dam, the smaller will be the area that will get submerged. Therefore, if the primary concern is to minimise submergence and consequent displacement of people, it is best to construct the highest dam that is technically feasible. Fact no. 2 – Unlike in western countries, rainfall in India is erratic. In Europe, it rains virtually every week; three weeks of dry spell would be deemed a drought there. In India, most of the rainfall occurs in a few weeks in a year and that too varies substantially from year to year. So while all rivers in Europe (even small streams) are perennial, in India even large rivers are seasonal. Therefore, Europe hardly requires any water storage except to develop a head for hydroelectric power generation. In India, unless water is stored for months, there is no hope for cultivating crops round the year. Fact no. 3 – India being a tropical country, evaporation loss is a major problem. Typically, 1.2 metres of water evaporate in a year. Therefore, shallow storage systems will lose most of their water by evaporation itself. Fact no. 4. - In the so-called good old days, famines were a frequent pestilence even though the population was barely a fourth of what is today. It is only the secure availability of water from the many dams that have been constructed in this century that we are now able to feed our burgeoning population. Fact no. 5 – Crops require water at the right time and at right amounts. With the haphazard rainfall pattern that we have, there is no way of ensuring proper watering of crops without round-the-year water storage. Fact no. 6 – Greening of desert areas like Rajasthan and Saurashtra is impossible using small check dams and run of the river schemes: only large dams can do so. For instance, Jaisalmer is fast ceasing to be a desert. That would have been impossible if the Bhakra dam had not been several hundred metres tall. Fact no.7 – India's rivers discharge most of their water into the sea. (The Cauvery is an exception – almost all of its water is utilised). Unless such discharge into the sea is checked, there will not be enough water for cultivation. Only large dams can prevent such wasteful discharge into the sea.

(Hindu, 1.12.1999, P.V. Indiresan)

(Dam Hydrology)

H5) A river reduced to a sewer

With a poisoned Yamuna flowing through Delhi, the water in most taps is not as potable as it ought to be. And all of Delhi is equally guilty of treating its main source of water like a sewer. The Yamuna enters Delhi at the Wazirabad barrage and leaves the city quietly 22.2 km later at Okhla, from where the Agra Canal conveys the "Water" to the city of the Taj. This stretch accounts for 2% of the river's total length but contributes 71% of its total pollution load. According to UNICEF, every 100 ml. Of Yamuna water

contains about 7,500 coliform organisms before the river enters Delhi. When it leaves the city, the coliform count is 240 lakh per 100 ml.

All sewage treatment plants (STPs) except Okhla and Keshopur are “under-loaded”. Poor management and unplanned location of the STPs has meant that plants with ample treatment capabilities are available in north-west Delhi (Rithala, Rohini and Narela) and South Delhi (Ghitorni and Vasant Vihar), while untreated sewage from the colonies of trans-Yamuna and Central Delhi is discharged directly into the Yamuna.

The CPCB has recommended agencies like the Municipal Corporation of Delhi, the New Delhi Municipal Council and the Cantonment Board paying a part of their house tax revenue to Delhi Jal Board for collection, treatment and disposal of sewage. Sewerage facility for the unauthorised and regularised colonies, the slums, and linking of development charges to be paid by residents to water charges over an appropriate time span is another recommendation. It is suggested that the DJB build plants according to actual need, depending on where there is more sewage generation, greater emphasis on development of a green belt in compliance with the Delhi Pollution Control Committee specifications, as well as use of biogas which has considerable energy value.

Adopting of management techniques to ensure optimum utilisation, and planned human resource development at various levels, by developing training courses in consultation with the Nagpur-based All-India Institute of Hygiene and Public Health are the other priority areas.

(Hindu, 24.11.1999, Alladi Jayasri)

(Water Pollution / Urban Hydrology, Delhi, Yamuna)

H6) No Salinity in Cyclone – hit areas

The agriculture Ministry today sought to allay apprehensions that soil in the coastal areas of Orissa might have got spoilt because of the massive intrusion of sea water following the super cyclone which struck the state last month. An analysis of water samples collected from several places along the coastline of the affected areas indicates that there was no salinity problem, perhaps because the sea water did not stagnate over the land for long with the heavy rain which accompanied the storm washing the sea water back into the sea.

(Hindu, 18.11.1999)

(Sea Water Intrusion/ Soil Salinity, Orissa)

H7) Punjab bid to boost rural water supply

The Punjab Government has embarked upon a massive programme, at a cost of Rs. 16 crores, to strengthen 67 existing rural water supply schemes covering 93 water-logged villages of Muktsar district 1999-2000.

The Minister said that out of 12,428 villages in the state, 8,579 were identified as problem villages having scarcity of drinking water as per the criteria fixed by the Union Government. He said keeping in view the commitment to provide safe drinking water in the state, the Centre has been asked to provide 50 % of the funds required for tackling the remaining problem villages under Centrally-sponsored schemes like accelerated rural water supply scheme and Rajiv Gandhi National Drinking Water Mission. The remaining 50% would be provided by Punjab Government under state-sponsored minimum needs programme, he added.

Referring to the steps initiated to check water pollution, the Minister said they would tackle the primary problem of chemical contamination of drinking water in Patiala, Sangrur, Ludhiana, Mansa, Bathinda and Faridkot districts by strengthening and augmenting the rural water schemes at a budget of Rs.10 crores during 1999-2000. Emphasising on the development of the Kandi areas of Ropar, Hoshiarpur, Gurdaspur and Nawan Shahar districts, Raja Narinder Singh said the state Government had made a special provision of Rs. 5 crores during 1999-2000 for the purpose.

It was decided to dig deep bore- hand pumps in the villages of this area following the pattern of Himachal Pradesh's old wells. Out of 2,564 rural water supply schemes commissioned upto March 31, 95% were functioning despite financial constraints.

(Hindu 11.11.1999)

(Water Crises / Water Quality, Punjab)

H8) Meneka calls for probe into benefits of big dam

The union minister and environmentalist, Ms. Meneka Gandhi, has called for a "proper inquiry" into costs and benefits of large dam being built on the Narmada river. Ms. Gandhi was critical of the tendency to justify huge expenditures on the ground that some money had been spent on a particular project and was cautious in her support for the government's nuclear programme.

On the Narmada project, she said: "I do not know whether it will provide drinking water to Saurashtra, the drought area. There are cheaper ways of getting drinking water by turning saline water into fresh water and then send it to villages".

On whether all big dams should be rejected in view of certain major irrigation projects like Bhakra-Nangal and the Rajasthan canal having contributed to higher agricultural production, Ms. Gandhi pointed out that big dams have been "banned all over the world".

Dams like Bhakra-Nangal came in at a time when pesticides were brought in, fertilizers were also brought in and seeds were changed. But the time given for its life is completely disproportionate to the amount of money spent on it. It has silted so fast that we have had to build a series of dams behind it. It has cost a million times than it should have.

(Hindu, 20.10.1999)

(Dam Hydrology, Bhakra-Nangal)

H9) Drinking Water projects "on a war footing"

The Government in Rajasthan has sanctioned Rs. 1,407 crore for various drinking water supply schemes in the state. Keeping in view the drinking water arrangements in different areas across the state, the final sanction to Rs. 1,100 crore drinking water supply scheme to Jaipur from the Bisalpur dam was accorded at the meeting. Mr. Bishnoi (Minister of state) directed the officials concerned to complete this project within a period of three years so that the residents of this capital city get relief from the perennial problem of water scarcity. The PHED minister informed the meeting that sanction was also being accorded to the Rs. 153 – crore Jawai- Jodhpur pipeline project which would provide potable water to 10 towns and 57 villages in Jodhpur, Pali and Jalore districts.

Similar sanction was accorded to another ambitious project costing Rs. 43.99 crores for providing drinking water to the people of Bhinai and Masuda areas. As many 232 villages and urban areas will benefit on completion of the project. The second phase of the Rs. 104 crores Rajiv Gandhi Lift Canal Project was sanctioned with a view to finding a permanent solution to the drinking water problem in Jodhpur city. In addition to these major projects, several regional drinking water schemes were also sanctioned at the meeting. They include a Rs. 2.32 crore urban water scheme for Pilani, a Rs. 2.58 crore scheme for Landu and a 3.6 crore scheme for the Nawalgarh area.

(Hindu, 10.10.1999)

(Water Crisis / Potable water, Rajasthan, Bilaspur Dam, Jawai-Jodhpur pipeline project, Rajiv Gandhi Lift Canal Project)

H10) Politics muddles river water issues

Water has traditionally been an emotive issue, whipped up time and again to an uncontrollable public frenzy to suit political parties of the day.

There are three lines of thinking on resolving river water disputes. One, all rivers declared national resources and a national authority, empowered with statutory powers for implementation, is formed. This is also the line taken by the World Bank as it easy to extend loans to a single authority and deal with as few individuals as possible. The second proposal is that there should be localised development through watershed management so that rainwater is harvested and ground water resources are replenished. The third is that a statutory authority be formed among the river basin states, with a non-basin state representative as the chair.

There is a provision in the Constitution that the regulation of inter-state rivers can rest with the Union Government in the public interest. However, with regional parties becoming part of national coalitions and regional interests taking precedence over national interests, it is unlikely that such a bill would be cleared by Parliament in the near future.

(Hindu 3.10.1999)

(Inter-basin Water Transfer / Water Policy, India)

H11) The World's Wells are drying up

In her new book, pillar of Sand/Can the irrigation Miracle Last? Senior fellow of the Worldwatch Institute, Ms Sandra Postel, reveals that water tables are falling in every continent due to over-exploitation of underground water resources and major rivers are drained dry before they reach the sea because of intensive drawing of water for irrigation and urban consumption.

In India, the pumping of underground water is now estimated to be double the rate of aquifer recharge from rainfall. The International water Management Institute, the world's premier water research group, estimates that India's grain harvest could be reduced by up to one-fourth as a result of aquifer depletion. In India, during the dry season, the Ganga has little water left when it reaches the Bay of Bangal. The Yamuna has been reduced to a drainage canal near Delhi.

(Hindu, 29.9.1999, N.N. Sachitanand)

(Ground Water Hydrology, Book Review, Ganga, Yamuna)

H12) Water Hyacinth colonises Upper Lake, Bhopal

The water hyacinth, a floating plant known widely for the nuisance it creates, has colonised a large surface area of the picturesque Upper lake here during the current post monsoon season.

This is the first time that water hyacinth has spread over a large part of the Upper lake, a major source of drinking water for the state capital. The local residents are particularly surprised by the rapid spread of water hyacinth in the upper lake since a massive cleaning up operation is going on in the lake under the ambitious Bhoj Wetland Project funded by Japan and steered by the state environment Department and state owned Environmental Department and state owned Environmental planning and Coordination Organisation. (EPCO). Water Hyacinth spreads quickly and clogs the water surface and this is what it has done near Rejghat and Kamla Park. The problem has stretched even in the area where the magnificent Yatch club was located a few decades ago.

The problem of water hyacinth has to be eliminated on top priority since there would be long term repercussions if the weeds are allowed to stay beyond a three-month period, experts point out. The oxidation of water due to the presence of hyacinth adversely effects the aqua life.

The feathery roots of the plants also suck plenty of water and its moisture content gets evaporated very fast through its rounded leathery leaves attached to spongy stalks. Due to this cycle, the water evaporates faster from a water body infested by hyacinth and the upper lake is facing this acute problem.

(Hindu, 29.9.1999)

(Lake Hydrology, Madhya Pradesh, Upper Lake, Bhoj wet-land Project)

H13) Chakrata belt reeling under water shortage

The areas to be irrigated by lift schemes taking water released from the Koyna reservoir include Khanapur taluk, where the struggle to build the Bali Raja Memorial Dam, a famous "small dam", was launched. This dam irrigates 900 hectares in two villages. Big Dams are not bombs; people who produce "cash crops" almost always eat better than those scratching out their subsistence on dry land.

(Hindu, 28.8.99, Gali Omvedt)

(Dam Hydrology, Krishna Dam, Narmada)

H14) Porous concrete helps 'greener' water system

A UNIQUE system designed in the U.K. provides an ecofriendly, porous concrete paving surface, which allows surface water to pass through to the specially designed sub-base.

The water collected there can be used for flushung lavatories or watering gardens. It prevents rapid rainwater run-off and flash flooding, retains oils, rubber particles and other surface contamination which could otherwise polture streams and watercourses.

The system is designed to last for at least three years. The square-meter concrete block is subjected to simulated rain showers that might occur during the year on a city the size of London, and oil leakage that might occur in one of its car parks. Bacteria, growing naturally in the ground, breaks down oil spillage into eco-friendly constituents and is fed by fertilizer in the experiment; the grains can be seen in the plastic net baskets that have been deployed over the surface of the block. The instrument measures the oxygen and carbon dioxide at various levels on the ground. It also retains oils, rubber particles and other surface contamination which would otherwise pollute stream and water courses. Research has shown that the paving system has the capacity to retain in the sub-base 98.7% of oil deposited on the paving.

The hydraulic performance and cost-saving benefits of the paving have attracted potential users iin industry and commerce in the U.K. and overseas. It has already been used in more than 45 projects, such as large car parks and paved areas for pedestrians, and may be exhibited in the Millennium Dome, which is being built besides the river Thames at Greenwich, ready for the New Year celebratory opening.

(Hindu 26.8.1999)

(Water Pollution/ Water Harvesting)

H15) Unsafe Drinking Water Cripples Villagers

A cluster of villagers in KHURDA Tehsil in Orissa is facing the threat of extinction with the villagers becoming crippled and dying from toxins in the drinking water. The people of Singpur, Balasing, Balasinghpatna and Pallibalasingh are struggling for their lives for many years. Environmentalist Mr. Banka Behari Das, who recently visited the villages, said he was shocked to see the pathetic condition of the villagers owing to lack of safe drinking water. In a letter to the Chief Minister, Mr. Giridhar Gamang, Mr. Das said the high level of fluriide content in the underground water crippled many residents before they attained the age of 40. Even the youngmen and women looked quite aged

and hardly anybody survived after 40.

(Hindu, 16.8.1999)

(Water Quality / Potable Water, Orissa)

H16) Gomti ground water contaminated

The ground water in the catchment areas of the Gomti here has been found to be "highly contaminated" with cadmium, nitrite and lead concentrations, claims a report. Samples collected from the community hand pump installed in Khadra, Deen Dayal Nagar and Patanala areas in old Lucknow showed high concentrations of cadmium, lead and nitrite – much above the permissible level, says the report by Director of Environmental Research Laboratory (ERL), a Government of India lab. While the concentration of lead was 600-1200 parts per billion (PPB) as against the prescribed limit of 50 PPB, nitrite was eight to 1110 PPB, normal limit being one PPB. Describing Dr. Saxena's report as "alarming", the Director of Industrial Toxicology Research Centre (IRTC), Dr. P.K.Seth said his institute would send its team for water analysis in the affected areas. We have to identify the source from where these toxic substances were released into water. These contaminants were tested using 'atomic absorption spectrophotometric method' which is a highly sensitive method to analyse trace elements.

(Hindu 10.8.1999)

(Ground Water Hydrology/ Water pollution, Lucknow (U.P.), Gomti)

H17) Godavari is rising

The Godavari is on the rise following rain in the catchment area. The inflows are likely to increase further as it started raining in the catchment of the Indravati and Taliperu, its tributaries, under the influence of the low pressure formed in Orissa coast. The flood level may touch the first warning level of 43 ft at Bhadrachalam in a day or two unless there is some let up in the rainfall.

(Hindu 6.8.99)

(Flood Hydrology, Orissa, Godavari)

H18) Fresh inundation in Bihar

Rain –swollen rivers continued to wreak havoc in Bihar inundating fresh areas in Patna and Vaishali districts. Swirling waters of Punpun, Morhar and Gandhar submerged more areas in Patna, Vaishali and worst hit Jehanabad districts. Officials in Patna said major rivers were flowing above or perilously close to the red mark

threatening fresh inundations in the state.

(Hindu, 2.8.1999)

(Surface Water Hydrology / Flood Hydrology, Bihar)

H19) Water project seeks entrepreneurs' co-operation

The proposed mega water project in the private sector, Asia's first, to be launched at Tirupur at a whopping cost of about Rs. 1,160 crores is yet to concretise, because the response from the entrepreneurs continues to be lukewarm. The primary aim of the project is to clear the water requirements of the industrial units, and hence, the unstained support of entrepreneurs has become of absolute necessity, but the response till now is not up to the expectations. Despite the roadshow organised by the New Tirupur Area Development Corporation Ltd. (NTADCL), the implementing

Authority, to enlighten entrepreneurs on the significance and implications of the project, the message does not seem to have gone down well with the entrepreneurs. Authorities say that, once it is materialised, the drinking water supply for the town would get augmented from 30 mld to 78 mld, thus benefiting three lakh people. Besides, 100 wayside villages located in Tirupur, perundurai, Chennimalai and Uthukuli panchayat unions would get a total quantity of 36 mld of water. In keeping with the primary objective of easing the water supply position to industry, the project promises to supply 10 mld of quality water to as many as 800 knitwear units.

According to the CAG report for the year ended March 1998, out of 10 major projects under the Narmada Valley Development Authority (NVDA), only the Rani Avanti Bai Sagar (RABS) project registered a marginal rise in irrigation potential by 12,000 hectares. The other nine projects under the NVDA are Indira Sagar, Omkareshwar, Maheshwar, Bargi diversion, Maan, Jobat, Upper Narmada, Upper Beda and lower Goi. The report highlighted the fact despite an investment of 33 % of the total estimated cost of Rs. 7,412.04 crore, no NVDA project has been completed so far. The construction of the dam and canals of the Indira Sagar project, the biggest under the authority, was way behind the schedule and no benefit was recorded in spite of a recorded spending of Rs. 922.55crores.

The purpose of creation of NVDA for planned and expeditious development of the Narmada basin was not served, the report concluded.

(Hindu, 19.7.1999)

(Dam Hydrology, Madhya Pradesh, Narmada Valley,)

H20) Jinx dogs hydel project

Ranjit Sagar Dam (Gurdaspur), After emerging from the rigmarole of technical, bureaucratic and political hold-ups, spanning decades, punjab's last major Hydel project – the Ranjit Sagar Dam (RSD) on the Ravi River – is finally complete. However, the inauguration of this Rs. 3300 crore project, which has come up after dislocating the population in 63 villages of Punjab, Himachal Pradesh and Jammu and Kashmir, seems to be jinxed.

However, the project, which has been constructed in the seismic zone, has other major features making it unique as far as technical aspects are concerned. With a height of 160 meters, it carries the distinction of being the highest rock and earth filled dam in the country. With a capacity to handle a discharge of 7.5 cusecs of water, its spillway is easily the largest in Asia. The spillway has four gates measuring 60 feet in height and 59 feet in width, each weighing 250 tonnes – again being the largest at any hydel project in the country.

The Punjab government has provided Rs.18 crores to neighbouring states of Himachal Pradesh and Jammu & Kashmir for afforestation and constructing check dams to reduce the silting process. He agreed that the state had yet to settle claims worth Rs. 78 crores as compensation for acquisition of land in Himachal Pradesh.

(Hindu, 19.7.99, Sarabjit Pandher)

(Dam Hydrology, Punjab: J&K: Himachal Pradesh, Ranjit Sagar Dam: Ravi River)

H21) Rains disrupt life in DK, Udupi dts.

Manglore, The incessant rains that lashed Dakshina Kannada and Udupi districts for the last three days, has left a trail of destruction in the region and two rivers are in spate. In Kundapur taluk, the Gangolli river was in spate submerging several places in the catchment area, In Udupi town, the Kalanska storm water drain overflowed to inundate the nearby areas, forcing people to take a detour to reach Manipal through Perampally. During the last 24 hours, Bajpe airport received a maximum rainfall of 238.9mm, followed by Uppinangady 219, Sullia 209.8, Manglore 188.8, Puttur 176, Belthangady 153.5, and Buntwal 102. In Udupi district, Kundapur received 173.4 mm of rain, followed by Udupi 142, and Karkala 104.2 mm.

(Hindu, 19.7.1999)

(Surface Water Hydrology, Karnataka, Gangilli River)

H22) \$240 million World Bank aid for two projects

India has to get another \$240 million from the World Bank for two projects. As per the agreement signed here today, assistance will be available for the second Tamil Nadu Urban Development Project and the second integrated water development projects covering many north Indian states. For the Tamil Nadu project, Bank assistance to the tune of \$105 million would be available to finance the project. The project to be implemented over a five year period, aims to assist the state government support the on-going reforms to improve urban finance and decentralise urban planning, help raise living standards by financing basic urban infrastructure including an integrated sanitation programme meant for the urban poor.

The other agreement is for \$135 million from the bank for the second integrated watershed development project covering Himachal Pradesh, Punjab, Haryana, Jammu and Kashmir and Uttar Pradesh. The assistance includes a loan of \$85 million and soft credit through the international development agency (IDA) of \$50 million. This project will also be implemented over the period of five years and aims to improve the productive potential of a vast area in the participating states. The objectives of the project include assisting institutional development, consolidation of the progress already made in harmonising approaches to watershed development and management through various programmes. The watershed protection and development aspects would involve sub-watershed treatment, fodder and livestock development, strengthening of rural infrastructure including upgradation of rural roads and construction and upgradation of potable water supply schemes and treatment of drainage lines to control soil erosion.

(Hindu, 15.7.1999)

(Urban Hydrology / Watershed Development, India, Projects)

H23) NHRC urged to probe river pollution issue

The Chaliyar Action Council has approached the National Human Rights Commission (NHRC) urging it to undertake a comprehensive investigation into the denial of right to life and livelihood of the people due to emissions from a polluting industry located on the banks of Chaliyar river in Kerala's Kozhikkode district. According to the Council, the chronic water and air pollution caused by the factory, Grasim Industries Limited, on the banks of the "unquiet river" in the last three decades has led to an increase in several fatal diseases among the villagers and factory workers. Based on the study, the Chaliyar Action Council has asked the NHRC to fix the responsibility and cost for the human tragedy and the environmental degradation caused by the Grasim unit.

Even though samples of the river water had shown high levels of BOD, COD, sulphides and colour, the Kerala state pollution control board (KSPCB) had not taken any action. The council has now appealed to the central pollution control board to intervene. The council declared that it would settle for nothing less than the immediate closure of the factory and rehabilitation of its employees, and appealed to the NHRC to intervene immediately.

(Hindu, 14.7.1999, Staff reporter)

(Water Pollution, Kerala, Chaliyar river)

H24) Digvijay Singh against big dams

The chief Minister of Madhya Pradesh, Mr. Digvijay Singh, today said he was against construction of big dams and had launched in the state major watershed development program, which generate water and electricity. He has sought the height of the Sardar Sarover dam to be restricted at 436 feet so that displacement was minimum.

The state has already constructed atleast four dams –0 Bargi, Tawa, Kolar, Barna, Sukta, Matiyari – on Narmada, while two large ones – Maheshwer and Indira sagar – are under construction. Another large dam is being planned at Onkareshwar. The NBA has raised serious doubts about the claims of lands being irrigated by Bargi project and has set off a major protest against the displacement of families by the privatised Maheshwar project, as well as the availability costs from this project. There is a difference of opinion between the official figure of displacement and the NBA counts. Besides, the NBA has alleged that the land the government proposed to make available for rehabilitation is “rocky” and “uncultivated” and there is lack of political will.

(Hindu, 11.7.1999, Gargi Parsai)

(Dam Hydrology, Madhya Pradesh, Sardar Sarover Project, Narmada river)

H25) Simple System that saves water

Michael Burton, a British electrical engineer with a particular interest in water conservation, discovered there was no water recycling system available anywhere in the world. So he set to and invented one. This was the beginning of the aquasaver system, a simple but ecologically and environmentally sound device that recovers bath and shower water, filters it to clean it of soap and other impurities and then stores it for flushing toilets, car washing and watering gardens. Aquasaver has been designed to integrate with building policies internationally and will meet the requirements of apartments, small hotels, clubs, holiday villages and domestic housing. It has been

proved to save up to 50 % of the annual water consumption in standard homes and up to 40% in hotels and other commercial buildings.

Among the major advantages of the system are; it is independent of mains water supply, thus avoiding cross-contamination between drinking and recycled grey water; no chemicals are used and there are no harmful by-products; It is energy efficient, using 12-volts direct current power for the pumps; (it can be run on solar power) ; it is fully automatic.

(Hindu, 8.7.1999)

(Water Conservation)

H26) Insitu rain water harvesting in arid zone

Anantpur is situated in the latitude of 14°–41', longitude 70°–40', 350 meters above mean sea level and with an average (10 years) rainfall of 641mm distributed erratically in the crop season. Harvesting and utilisation of scarce rain water to the maximum extent for the requirement of plants is necessary to establish and expect better growth and higher fruit yield in dry land.

An experiment was stated on ber (variety – gola) with an objective to fix up optimum catchment area per plant in arid zone for maximum utilisation of rain water by diverting the flow part of the catchment area naturally and artificially. The treatments imposed were 100%, 150%, 200% and 250% of normal catchment area of 6x6m with required gradient of 5% slope and no slope, in a randomised block design with factorial concept, replicated four times.

The data of soil moisture at different depths 10-15cm to 60-70cm revealed that more percentage of soil moisture were recorded in 5 % slope at 60-75cm depth in 6x6 catchment area after second and third weeks of participation (21.6mm) respectively, while it was recorded as 8.5% and 8% in no slope at the same depth and catchment area after second and third weeks.

Significant differences in growth and production were observed in drought year (516mm 1997) among gradients and catchments while there was not much difference in normal year (937.2mm 1998) may be due to availability of soil moisture irrespective of catchment and gradients. The yield data showed that significant superior fruit yield of 32.0 kg per plant was recorded in 6x15m catchment area with 5 per gradient over all the treatments by utilising more rainwater harvested through 5 % and catchment area.

The data also revealed that significantly superior fruit yield of 8100 kg per hectare was recorded in 6x6m with 5% gradient by harvesting and utilizing the rain water for more number of plants in unit area, while it showed less yield of 7500 kg/hectare in the same catchment area of 6x6 without gradient. With this, it can be concluded that individual plants as well as plants in a unit area will produce more yield of 10-15 % and increased plant spread of 20-25 % with 5% slope. Therefore, it is recommended to provide 5% gradient in between the rows of 6x6 m in ber plants for efficient utilization of rainwater, harvested naturally and artificially specially in drought years, occurring 6 out of 10 years in arid zones.

(Hindu, 8.7.1999, K.Satyanarayana Reddy)
 (Water Harvesting, Anantapur)

H27) One Month of Summer Rainfall

Cumulative Rainfall for the Period 01-06-99 to 30-06-99

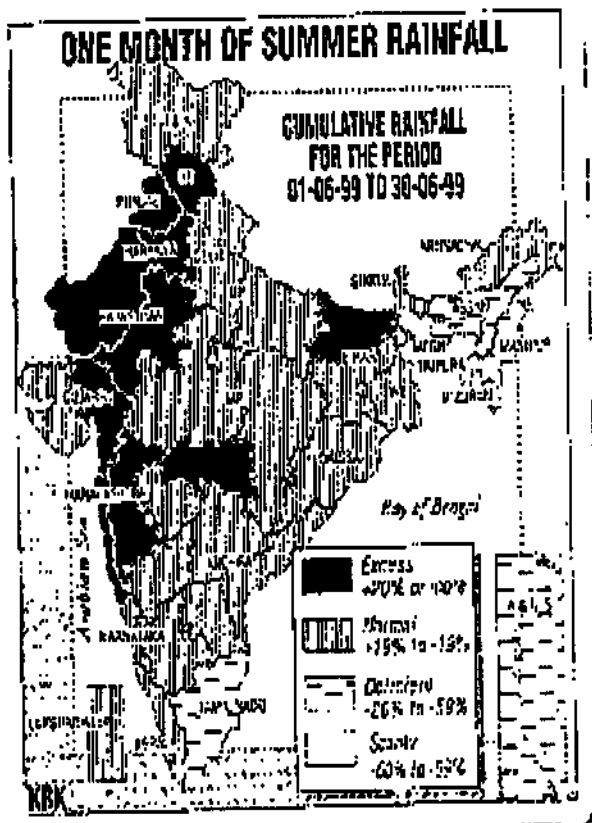


Fig. 1: One month of summer rainfall of India

(Hindu, 6.7.1999)
 (Surface Water Hydrology, India)

H28) Rajasthan Water policy ratified

The water policy of Rajasthan was ratified in a meeting of the State Water Resources Council. The policy has been framed with an eye on the requirement of water for drinking, irrigation and industrial development so as to ensure a substantial utilization of the available water. He said the state government was making extensive efforts for revival and maintenance of conventional water resources. In another significant domain, the policy has dealt with the declining ground water table and the need to replenish it.

The policy has laid down another important provision for modernisation and adequate training for maintenance of water resources as well as for the safety measures of dams.

Besides ensuring optimum utilisation of water available within the state, the policy envisages bringing in water from the neighbouring states, whenever it is needed. A few special provisions have been made for bringing the waterlogged and saline-affected areas under the agricultural use. Yet another term in the policy provides for sufficient conservation and proper utilisation of water in every field.

(Hindu, 4.7.1999)

(Water Policy, Rajasthan)

H29) Monsoon: MCD control rooms set up in all city zones

The Municipal Corporation of Delhi (MCD) has set up control rooms in all its zones and headquarters as well to receive monsoon-related complaints. The round – the-clock control rooms will become functional. The telephone numbers of these control rooms have been simplified and a citizen will only have to dial “2700” after dialing their area code to lodge their complaints, barring that of Narela Zone.

The control rooms will receive complaints pertaining to water – logging, sanitation, sewer blockage, missing manhole covers, public health, unauthorized constructions, removal of dead animals, repair of pot-holes and dangerous buildings.

(Hindu, 22.6.1999)

(Water Management, Delhi)

H30) Digvijay fears water crisis for M.P.

The Madaya Pradesh chief minister, Mr. Digvijay Singh, today expressed the fear that the state might confront the drinking water crisis in its worst form in the next 10

years and emphasized the need for special attention on this front.

Instead of going ahead with a highly centralised initiative with a state-wide perspective, it has been found that efforts at the district and panchayat levels through the participation of the local people have produced good results when it comes to recharging the old lakes and reservoirs.

He particularly cited the example of Shahdol, Mandasaur and Raipur districts, where the old reservoirs have been cleaned and recharged recently with motivation from the district administration and supervision of the panchayats. District administrations have been given special priority to conservation and recharging of ground water.

The work of deepening and renovation of canals, tanks, wells and other water bodies has been taken up and promoted as a popular movement in the state with the cooperation of the community and panchayat bodies.

(Hindu, 21.6.1999, Staff correspondent)

(Water Crisis / Ground Water, Madhya Pradesh)

8.0 *TIMES OF INDIA (T)*

T1) Gujarat officials told to expedite water projects

Ahmedabad, Chief Minister Keshubhai Patel has directed the administration in the eight water scarce districts of the state to start work on a war-footing and ensure sufficient supply of water to all the affected villages and towns till the end of next summer. He also announced distribution of fodder at Rs. 1 per kg.

Addressing a joint meeting of district collectors, revenue and panchayat officers at Gandhinagar, the CM said the situation was normal in affected villages over the issue of distribution of water. He suggested that about 125 lakh gallons of desalination and fresh water should be made available from a plant of an industry in Jamnagar. He directed the officials to develop groundwater and other alternative resources to ensure water supply in Rajkot district.

(Times of India, 29.12.1999)

(Water Crisis / Water Management, Gujarat)

T2) Precious water went down the drain in Gujarat

Vadodara, The recent floods in the Narmada have cost Gujarat dearly. The 10-day saga of Gujarat's largest river going berserk has not only displaced a sizable population and caused colossal wastage of precious water. According to the estimate of the Narmada flood control centre and the Central Commission on Water (CCW), the water that flooded the villages could have taken care of the state's entire requirement of water for the next 15 years.

During the peak of floods, Gujarat lost 23,000 cumecs or seven lakh cusecs of water every second. This water virtually went down the drains every second for 10 days. They cry foul over a dam and here is what we lose every year, in the present context, every second. Water in abundance goes to waste in Narmada, Bharuch and Vadodara districts (that dot the course of the Narmada) during the floods. There is no awareness among villagers to conserve the rainwater. They don't make small reservoirs, which can serve to store water or channels running parallel at a distance from the riverside. The villagers need to be informed about watershed management systems. There should be an effort at the collectorate level to bring grassroots –level awareness about water conservation.

(Times of India, 27.9.1999)

(Water Crisis / Water Harvesting, Gujarat)

T3) A Crop for your roof-top

Rooftop rainwater harvesting is quite simple-the idea is to let the water from the roof flow down where it would best recharge the groundwater level. The method, in fact, is so cost effective that its installation costs equal one-year energy costs of a tubewell. If there is an existing borewell, the system costs lesser a mere Rs.5, 000 to 10,000.

Summer water-blues could be a thing of the past - while a 100 square meter roof, a family can collect upto 50,000 liters water - enough to sustain five individuals for four months. Here is what needs to be done: A PVC pipe has to be drawn from the terrace down to a collection tank - where water is allowed to filter, before it is allowed to run into a borewell.

The Central Ground Water Authority has been making sustained efforts over the years to popularize the concept. The Authority, says chairperson D K Chadha, is inundated with queries from societies and individuals asking for technical help. With cities like Chennai and Hyderabad incorporating it in their bylaws. Delhi may not be far behind.

(Times of India, 25.7.1999)

(Water Harvesting, India)

T4) Want Water, harvest it

Neglect of the centuries-old water harvesting systems has left Delhi parched. These, if tapped, can put an end to the Capital's water-woes, says Pallavi Mittal

The low-lying area around the Tughlakabad Fort speaks of the enormous amount of water it had cradled in earlier times. Today, with a part of drainage system converted into a drain, the Fort looks on, testimony to the dying wisdom of water harvesting.

- The Khiljis during the 12th century built a reservoir in the plains of Siri, the second city of Delhi, to harvest water from the Aravali hills. Banks of the forgotten tank can still be traced.
- A large tank was similarly built by Sultan Iltutmish inside Qila Rai Pithora of Mehrauli. This has recently silted up and its catchment area has been encroached upon by private builders and the Delhi Development Authority.

Few have stopped to think what these oversights have cost us. Delhi which has one of the richest natural water supply systems, is not only being forced to wait for water

from far away dams and barrages, but also beg for it from the neighbouring states. Most of the traditional methods - low-cost and harmonious to India's weather cycle, have either been forgotten or discarded in view of "planned development".

Consequently groundwater, the only buffer stock available, is coming under the butchers' axe. But why this continuing neglect of water harvesting systems, which can bring an end to water-blues in the Capital? Experts stress proper storage of rainwater can bridge Delhi's current demand-supply gap - about 150 million gallons a day. Yet, instead of storing this resource, we make a special effort to drain it away.

A blueprint for water augmentation in Delhi prepared by the Indian National Trust for Art and Culture Heritage (INTACH) does further calculations. The annual precipitation over the NCT Delhi in volumetric terms comes to 900 million cubic meters, which is half of the projected annual requirement. The challenge, says the report, is in storing the highest possible fraction of this precipitation in the limited and densely built-up area available.

Regional planner Suresh Rohilla blames unplanned development over the years for the present situation where more than 40 per cent of the population is being forced to burrow underground looking for water, or wait for the tap to trickle. With a little consideration for geological factors, water can be stored at most places: In channels, quarries, paleo-channels, village ponds and rooftops.

The Najafgarh channel, which has been deepened for storing water, is an encouraging example. Another scheme for off-channel storage in the Dwarka masterplan greens adjacent to the Najafgarh drain, has been submitted by INTACH.

Several quarries have been identified in Bhatti, Tajpur, Rajokri etc. Historical waterbodies like those in Hauz Khas, Satpula and Mughal Tank (Narela) have fallen into disuse. And though village ponds can also serve as recharge structures, they have been turning into cesspools with increasing reliance on tubewells.

Besides tanks, baolis or stepwells are another important feature. The water from gandak-ki-baoli is still used for washing and bathing. Some like the Palam baoli and Uggarsen-ki-baoli, in other parts of the city have dried up.

(Times of India, 25.7.1999, Pallavi Mittal)

(Water Harvesting, Delhi)

T5) Water experiments transform JNU

It has only taken three small dam-like structures to turn the parched Jawaharlal Nehru University campus into a veritable paradise. Built over the past two years, these check-dams have ensured gushing water where borewells ran dry.

This is not the only experiment, which shows that academic proposals can come alive. Some people have finally realised it is silly to let rainwater drain away or evaporate and is now giving the different methods a test: Check-dams have been built, baolis (stepwells) restored, roofs harnessed and shafts dug up. More sites for harvesting are being identified each day. JNU School of Environmental Sciences assistant professor Saumitra Mukherjee says the water level here has already taken a jump of five to seven metres. The dams were built by the Central Ground Water Authority after sites were identified through remote sensing.

The Rashtrapati Bhawan is in the queue for an experiment in rooftop harvesting. The President's nod has left the CGWA busy, wanting to encash on this year's showers. Results of rooftop harvesting experiments carried out by the Authority at the Indian Institute of Technology last year have also been encouraging. The water level here jumped by almost a metre.

Malviya Nagar too, experienced a dose of newfound wisdom last year, when a project to harvest water through shafts was announced. Though a few narrow, vertical pits were dug up, the project later got stuck and no follow-up was done to gauge the benefits derived. CGWA chairman D K Chadha is optimistic, "We would like to try this out in other areas, particularly parks", he says.

(Times of India, 25.7.99, JNU)

(Water Harvesting, Delhi)

T6) Water may dominate election campaign in Bhopal

The acute water scarcity in the state capital may emerge a key issue in the poll campaign for the Bhopal Lok Sabha seat despite the supposed dominance of national themes.

Bhopal at present gets nearly 30 per cent of its water needs, including drinking water, from the Kolar dam, the rest from the Upper Lake and hundreds of privately sunk tubewells. Apart from the nagging shortages, even the basic quality of the water remains suspect: that from the Lake has traditionally been regarded as calcium-deficient, hence a potential health hazards.

Bhopal mayor Uma Shankar Gupta conceived of a Rs.111-crore HUDCO financed project to route another pipeline from Kolar to alleviate the immediate shortages. Mr. Sharma also doubted that if the Kolar dam was in a position to release anything beyond the present 30 million gallons per day (mgd) since villagers in neighbouring areas were already plagued with shortage of irrigation water.

Under such circumstances, the Congress MLA argued that "bringing water from the Narmada in Indore" seemed the only effective way to deal with the crisis. Mr. Gupta promptly countered that the Congress promise of getting the Narmada waters to Bhopal was nothing but a ruse. The proposal to "bring the Narmada waters" had been sent to chief minister Digvijay Singh way back in May 1995. Hopes were again raised in 1998 when the chief minister promised to get a survey done. Again, nothing happened.

(Times of India, 20.7.1999, Sudhir K Singh)
(Water Crisis, Madhya Pradesh, Kolar Dam)

T7) Urban Pollution causing maximum damage to planet

Cities occupy just two per cent of the earth's surface but are responsible for undermining the planet's health and living conditions of its inhabitants.

According to a study conducted by Molly O'Meara, author of Reinventing cities for people and planet, urban conglomerations account for roughly 78 per cent of the carbon emissions from human activities and use of 76 per cent of industrial wood and 60 per cent of the potable water.

The unhealthy air affects at least 1.1 billion people in the world. More than 50,000 Indians in 36 cities die due to pollution-related complications every year. In the urban areas of China, the toll was over three million in 1994-1996. At least 600 million people in the cities of the developing world do not have adequate shelter, Ms. O'Meara says.

"These figures suggest that the struggle to achieve an environmentally sustainable economy will be won or lost in the world's urban areas", says the study, sponsored by the Worldwatch Institute, a Washington-based research organisation.

"London, for example, now requires 58 times its area just to supply its residents with food and timber. If the same parameters are applied to meeting the needs of everyone in the world, we would require at least the space of three more earth", the study adds.

Rapid urbanisation in the 20th Century has magnified the problems arising out of environmental degradation. Whereas in 1900, only 160 million people, one tenth of the total population were living in urban areas, by 2006 it will cross more than 3.2 billion. According to the projected estimates, the world population in the year 2006 will cross 6.5 billion.

(Times of India, 19.7.1999)

(Urban Hydrology / Global Warming)

T8) Yamuna: River of life dying a slow death

Revered as a goddess, Yamuna the lifeline of Delhi quenching 60 per cent of the Capital's thirst, is today also receiving 60 per cent of untreated domestic sewage not to mention industrial effluents, fly ash and other chemicals that the river is supposed to cleanse.

As environmentalists dish out such frightful figures, authorities speak of feasibility studies to restore the river suggesting, among other things, allowing free flow of the river that has self-cleansing properties. "From entering Delhi at Palau village near Wazirabad to leaving it at Gokhla, Yamuna is constantly fed by drains carrying domestic and industrial waste. "Not only is its water unsafe for drinking, but it also has no scope for sustaining any kind of aquatic wildlife. Concrete steps need to be taken fast lest we lose the river forever," says Sureshwar D Sinha, of 'Pani Morcha' an NGO that has filed a PIL in the Supreme Court seeking restoration of adequate flow of water in the Yamuna and Ganga rivers.

"There has been no flow of water in the river since the mid-80s. After the Najafgarh drain empties around 60 per cent of Delhi's sewage just 100 metres after the river enters Delhi, Yamuna has started looking like one too," says Mr. Sinha.

"The degeneration of the river is becoming a major health hazard for the denizens resulting in diseases like cholera, malaria, as also tuberculosis, says environmentalist Iqbal Malik. Agrees A K Gupta, chief engineer, irrigation and flood control, Delhi government, "such large-scale pollution of a river which provides nearly 60 per cent of drinking water to the capital definitely does not augur well for the people". The only solution is to recharge the drains and recycle sewage so that the quality of water in the river is improved, says Balraj Taneja, ex-chief engineer, Delhi Jal Board and senior consultant to INTACH, which recently submitted a blueprint on Delhi's water problem to the government. Allowing adequate flow of water in the river will let marine life thrive and pollutants will also flow downstream leading to dilution to pollution levels,

says Mr. Taneja noting that "water has its own self-cleansing qualities which will recharge the river and make it suitable for navigation also".

The main source of pollution, says Mr. Sinha, is domestic sewage, pumped into the river not just by the drains across the capital, but also from unauthorized colonies. "The Najafgarh drain itself discharges around 1028 million cusecs of sewage into the river. The drain itself is fed by 30 others from west and central Delhi. In addition to it domestic sewage is also pumped by unauthorized slums all along the river", says Ms. Malik. Besides, large amounts of industrial and hospital waste, pesticides and agricultural waste thrown from nearby fields, is also polluting the river.

Mr. Sinha also points to the 'rivulets of detergent' from the dhobighats dotting the banks as also half-burnt bodies from the municipal crematorium adding to the river's woes. Mr. Gupta says the problem of domestic sewage can be solved by constructing one major drain downstream of the river near Nizammudin with other drains emptying into it. "All the sewage emptied into the single drain would then easily be recycled through a sewage treatment plant," he says.

As for the fly ash, the power stations in future will have plants that shall treat fly ash before draining the left over into the river, says Mr. Gupta.

Another factor linked with the degeneration of Yamuna is eucalyptus trees grown along the river which draw large amount of water further depleting the river's water resources, says Ms. Malik, suggesting that they be replaced by neem or keekar.

Intach experts suggest that free flow would help cleanse the river to a great extent, but all the same public awareness is to be aroused for their own sake - and also for the sake of the river.

(Times of India, 17.7.1999, Varun Soni)

(Water Quality, Delhi, Yamuna)

T9) Protect Ground Water: Expert

The workshop was jointly organised by the Tamil Nadu Agricultural University (TNAU), the Australian Centre for International Agricultural Research and Commonwealth Scientific and the Industrial Research Organisation (CSIRO). Director of Australian centre for Ground Water Studies says it is always better to protect ground water first, rather than relying on technology to clean up water from a contaminated source. He said ice caps and glaciers account for 76.6% of the fresh water source on

earth, followed by ground water 22.7%, and surface water, a mere 0.5 %. Despite ground water being a major source of drinking water, it was often disregarded because of a lack of knowledge about its behaviour. Though Ground water is the principal source of drinking water, particularly in rural areas and also for irrigation, it had either been polluted or over used, making it impotable or resulting in its depletion. He said though techniques are available to clean-up polluted or contaminated ground water source, but these are very expensive.

(Times of India, 12.7.1999)

(Ground Water Hydrology/ Potable Water, India)

T10) El Nino helps slow global warming

El Nino prevents the Pacific Ocean from releasing as much carbon dioxide into the atmosphere as usual, phenomenons that may help slow global warming, scientists say. Researchers from the National Oceanic and Atmospheric Administration found that from 1991 to 1994 when El Nino warmed the Pacific, the ocean released 30 percent to 80 percent less carbon dioxide, a gas that is believed to trap heat in the atmosphere. The finding was published in the recent edition of Nature.

Scientists commonly estimate how much carbon dioxide should be in the atmosphere by calculating how much fossil fuel is burned. But some 2 billion tons (1.8 billion metric tons) of carbon dioxide go unaccounted for each year. According to the NOAA research, reduced carbon dioxide releases in the Pacific Ocean during El Nino could account for about 16 percent to 36 percent of this missing Co₂. "Obviously, we are very interested in where the Co₂, which we are releasing every year during fossil fuel burning, ends up," said Rik Wanninkhof, an NOAA oceanographer. Understanding the year-to-year changes in Co₂ levels is key to explaining how the oceans, the land the atmosphere regulate earth's climate.

Previously, episodes of El Nino the naturally occurring, cyclical warming of the Pacific Ocean were shown to spur more plant growth, which in turn sucks carbon dioxide out of the atmosphere. The NOAA research shows yet another way El Nino helps reduce Co₂ levels.

(Times of India, 19. 4.1999, David Kinney)

(Environmental Hydrology, Pacific Ocean)

T11) Govt has ignored our reports: Geologists

Geologists employed by the uttar pradesh directorate of Geology and mining

lament that all their reports are treated as a “formality” and never taken seriously. They say the recommendations of the report prepared soon after the October 20, 1991, quake that devastated large parts in the hilly regions have been put in cold storage.

The degree of government apathy, they say, can be gaged from the fact that a cold storage constructed at Uttarkashi in violation of the norms caved in. The matter is pending inquiry. Citing another instance, they point out how another report which recommended a ban on “construction of buildings etc” in the Tambakhani area of Uttarkashi township has been ignored by the district magistrate. They warn that in the coming monsoons, there is a distinct possibility of landslips in Uttarakashi. This would not only pose a serious threat to human life and property that have been allowed to mushroom on the hill slopes but could also cut off the only approach road that links the township with Rishikesh and Gangotri and extends up to the areas bordering China.

One geologist, Vibhuti Rai, who teaches in Lucknow University, says the government should either impose a blanket ban on indiscriminate constructions or allow subsidy on quake-resistant building material. More importantly, he says, social awareness should be focussed on.

(Times of India, 3.4.1999)

(Surface Water Hydrology, Garhwal)

T12) Tehri Dam proves sceptics wrong

The Rs. 5000 – crore Tehri dam, at the centre of a fierce environmental controversy before and during its construction, has withstood the quake shocks with aplomb. Not a crack appeared in the structure in Sunday night’s severe earthquake that killed over 100 people and damaged hundreds of houses in Garhwal.

(Times of India, 3.4.1999)

(Dam Hydrology, Garhwal)

T13) Jal Board accused of ignoring fresh water source in city

Millions of gallons of freshwater lie untapped right in the heart of the city. The Central Ground Water Authority says the large reservoir of water in the Yamuna flood plains can easily meet the water shortage faced by the city, particularly during the summer season.

The Authority blames the Jal Board for ignoring this potential. The Board, Authority officials point out, is running helter-skelter to procure water, when it is

"available right under their nose". Jal Board officials, pointing to a number of planned measures to bridge the gap, say they have not ruled out the possibility. They say the land is being used for agriculture and they try to persuade cultivators to allow them to bore tubewells. But, drilling tubewells in illegal colonies, construction of ranney wells and appealing to Haryana to release water seem to top their agenda.

The Authority, in a report submitted to the Jal Board last year, had suggested the Board install about 1,000 borewells along the flood plains to meet the 150 million gallons a day water shortage. Although the Authority has installed about six wells on an experimental basis, the Board has seemingly shown no interest in taking up the work.

The Authority, in its report, identified five sections in the entire Yamuna flood plain stretching over 97 sq.km. Each of the six wells installed in the flood plain area is yielding 1,500 to 3,000 litres per minute, with one day's output totalling 3.6 million litres a day. "Even if clusters of 10 wells are installed at a few places, there would be enough water for supply, particularly to blocks like Mehrauli and Kanjhawla", says the Authority's Delhi in-charge, S. B. Singh. The existing pipelines for transporting water from ranney wells could be utilised for this, he adds.

The Authority argues it has already installed about six wells in the area and it is the Jal Board's job now to carry on the work. "We are not a tubewell making department. Our job is to explore and give directives," says an official.

Dr. Singh stresses the government should take over the entire flood plain and convert it into a groundwater sanctuary - there should, in other words, not be any other activity there. "This region is the lifeline of Delhi," he adds. Jal Board officials say acquiring control over the land would be a problem.

(Times of India, 30. 3.1999)

(Water Management, New Delhi)

T14) No hike proposed in water rates

No increase in water rates have been proposed by Delhi Jal Board Chief Executive officer Pradeep Mehra in the budget for 1999-2000 presented before the Board on Sunday. This is the Board's first budget after it came into existence in April last year. Mr. Mehra said in the next financial year the revenue from water consumption would go up from Rs.160 crore to Rs.223 crore. A Board official said the revenue would rise due to the hike in tariff announced last year. He said, "Since the hike was announced in July last year, in many area the billing was not done as per the new rates.

He said, in the coming year, the billing would be done entirely as per the increased rates and this is how the revenue is likely to go up.

On the expenditure front, the official said about Rs.417 crore would be spent on the treatment of water and about Rs.173 crore would be utilised for drainage services. In the budget, Mr. Mehra proposed an increase in the grant-in-aid, from Rs.18.76 crore to Rs.74.95 crore. "A four-fold increase has been proposed to provide water and sewerage facilities for the weaker sections in the society, the official said.

He said the Delhi government, which is to provide the grants, had promised to do so earlier provided it was utilised for underprivileged areas only.

Highlights:

- ⊖ 2000 deep bore hand pumps and 250 tubewells will be installed within a month.
- ⊖ 100 tankers will be purchased to create a fleet of 600 tankers before the onset of summer.
- ⊖ Eight underground reservoirs to be completed in the trans-yamuna-area.

(Times of India, 30.3.1999)

(Water Management, New Delhi)

T15) Ahmedabad cries for a few drops more

The Ahmedabad Municipal Corporation is unlikely to resume the evening water supply in summer as a crisis threatens the municipal water reserves this year, say sources.

Due to scanty rain last monsoon, the Dharoi dam reservoir has water only up to 585.16 feet. This is nine feet short of the water level recorded during the corresponding period last summer. Moreover, in the wake of the controversy over the diverting of the Dharoi dam waters for irrigation, the state government is also unlikely to release more water for Ahmedabad from the dam this summer.

When contacted, water supply and sewerage committee chairmans Atul Bhavsar said: "There will be no problem". He added that the issue had not yet been discussed at length. At present water is supplied for two hours in the morning (6-8 a.m.) which may be increased by a few minutes to support the summer demand, if the political pressure is heavy, sources say.

Usually, the AMC resumes the half-hour evening supply during summer by

March 15, but it has not been able to do so on a regular basis for two years when the Dharoi reservoir level crashed to 584 feet during the corresponding period. On the other hand, if the evening water supply were resumed, the AMC would be compelled to meet its demand from ground water, which means more expenditure on electricity.

(Times of India, 26.3.1999)

(Water Availability, Gujarat, Dharoi Dam)

T16) Water supply may run dry by 2010, says Dikshit

Chief Minister Sheila Dikshit told the Delhi assembly on Tuesday that by the year 2010, there may be a situation in the Capital when there will be not a drop of drinking water for Delhiites. "It (water) problem can become worse than the power problem". Ms. Dikshit said during a "short duration discussion" on the second day of the budget session of the Vidhan Sabha on Tuesday.

The discussion regarding the water and electricity problem in the city continued for nearly five hours. Ms Dikshit said negotiations were on with the World Bank for a study to see how 24-hour clean drinking water can be provided to Delhiites.

Ms. Dikshit said there was a serious problem with the water distribution system in the city. "There is a leakage of about 25 to 30 percent water and sewage also gets mixed with our drinking water. That's why we are replacing the old pipe lines on a war footing", she added.

As for getting raw water for the 40 MGD Nangloi water treatment plant. Ms. Dikshit said she has already held three meetings with the Haryana Chief Minister. "It seems the Haryana Chief Minister has not softened so far and I have sought the Union Government's help to solve the problem". Ms. Dikshit said every possible effort was being made to meet the Capital's daily requirement of 750 million gallons. "We have increased water tankers from 700 to 1,000.

(Times of India, 25.3.1999, Staff Reporter)

(Water Crisis, New Delhi)

T17) Unfit for farming, fit for the thirsty?

More than five lakh residents of Noida and another two lakh people in Ghaziabad, both areas bordering Delhi, are regularly drinking groundwater that has been officially certified as "unfit even for irrigation".

The groundwater in most of Noida and Ghaziabad's Trans-Hindon areas is too saline to be potable, according to the Zoning Atlas for Siting of Industries prepared by the Central and UP Pollution Control Boards. Prabhat Chaturvedi, the UP PCB official responsible for preparing the zoning atlas, confirms that the water contains "excessive iron, calcium, magnesium, sodium and other salts".

The residents of Ghaziabad drink water from their tubewells because the civic body does not supply enough potable water. But in Noida, the New Okhla Industrial Development Authority (NOIDA) is itself supplying non-potable water from its ground resources. Noida's chief executive officer Siddharth Behura says the authority provides hygienic water: "But we cannot do anything about the hardness. We drink this water, too". But the residents are fed up. Those who cannot resign themselves to the brackish taste buy mineral water or get water from Delhi. They complain of corrosion in their desert coolers, geysers and washing machines. Cooler motors get burnt. Corroded water pipes leak, causing seepage in many buildings.

Heavy salts affect the body's digestion, points out Dr. Rajinder Midha, a resident of Sector 14. "Our water-filter's candle gets covered with brown coating all too quickly. These are water salts". The zoning atlas clearly specifies that disposal of effluents or waste should not be allowed in areas with poor groundwater quality. But both Noida and the Ghaziabad Trans-Hindon area are primarily industrial.

Senior civic officials say the Ganga Water Scheme - which will supply 20 cusecs Ganga water daily to Noida and 30 cusecs to Ghaziabad - will take about three years to be completed.

(Times of India, 14.3.1999, Lalit Kumar)
(Water Quality, New Delhi)

T18) No surrender of claim on river waters: Bansi

Chief Minister Bansi Lal said on Friday that Haryana would not surrender its claim on sharing of waters with Punjab and said the Eradi Tribunal award was final as it was constituted by the Central Government and its award could not be reopened.

Referring to Punjab Chief Minister Prakash Singh Badal's statement ruling out completion of the Punjab portion of the Satluz-Yamuna Link (SYL) canal as the state had no surplus river waters to be given to Haryana. Mr Bansi Lal said Mr Badal was Punjab Chief Minister and Devi Lal was Chief Minister of Haryana when digging of SYL canal was started. How could Punjab backout now? If Punjab needed any clarification

about any clauses of the Eradi award it can be sought, but the entire award cannot be ruled out. He was speaking to reporters at Pabnawa, after addressing a public meeting at Dhand village, about 20 km. from here, in Kaithal district.

Mr. Bansi Lal said no government could provide free power as it has to incur huge expenses in generation of power. He said Punjab had more canal water available for irrigation purposes, whereas Haryana was solely dependent on tubewells for irrigation.

The Haryana Congress on Saturday urged the Chief Minister Bansi Lal to convene an all-party meeting to chalk out an "Action Plan" in the light of Mr. Badal's "provocative and unjustified" utterances on the completion of the SYL canal and the territorial disputes between the two states.

(Times of India, 14. 3. 1999)

(Inter- Basin Water Transfer, Chandigarh)

9.0 *Indian Express (IE)*

IE1) Price of Water

On an average, Delights have to shell out Rs. 119.6 crore each year just because the Delhi Jal Board's water supply is erratic and completely unreliable? On an average, a household in Delhi spends around Rs. 844 every year to reduce the unreliability of water supply, by spending on tanks and bore-wells. According to habitat, a quarterly newsletter on housing and urban infrastructure, if you view this in terms of time opportunity costs, this works out to a loss of around Rs. 1,012 per household in the capital.

Moreover, Rs.230 per household is spent each year to make the water drinkable. Another Rs. 96 is spent per year by each household on an average to free it from water-borne diseases.

Water woes (Annual cost of water Unreliability Borne by Households in Delhi)

	Total cost (Rs. Crore)	Average cost per household (Rs.)
Annual cost of reducing water supply unreliability	119.6	844
Time opportunity cost	143.3	1,012
Water treatment	32.6	230
Water Borne diseases	13.6	96
Total annual cost of reducing water unreliability plus cost of treatment plus cost of water borne diseases.	309.1	2,182

Source: Price waterhouse coopers (Quaterly Newsletter on Housing and Urban Infrastructure)

(Indian Express. 20.12.1999)

(Potable Water, Delhi)

IE2) Kochi inventor rains water on parched islands

When Antoji diverted rainwater from his roof to an eight-metre pit filled with river sand, he did not know he was spawning a subtle water revolution on parched Vypeen islands. His technology is now widely copied by many water-scarce panchayats on the islands. Impressed, the Kerala Water Authority, which has itself failed to meet the

requirements of the people, has said it is willing to be a disciple. The planning Board now plans to study Antoji's harvesting technology, and a team will be visiting him from December 1 to 20.

Antoji's water reservoir is a pit filled with river sand. It is surrounded by a wall so that the water does not flow out. Because of the sand, water sinks on its own as well as gets purified. A motor is installed over the pit to pump the water out. "I even supply neighbors and sometimes give away two tankers loads to the needy," Antoni says. The experiment cost him just Rs. 3000.

When he started getting lots of water, he delinked himself from the Kerala Water Authority. Soon, neighbours who found his water was of good quality started adopting his model and building own reservoirs. Initially, five families built the sand –filled pits. The panchayat authorities heard about it and stepped in to encourage the experiment. The gram sabha has allotted Rs. 15 lakh to this project. At least 120 families in Chellannam alone have fabricated their own water reservoirs using this model.

(Indian Express, 25.11.1999, Leela Menon)
(Urban Hydrology / Water Harvesting, Kerala)

IE3) Where the drought has dug in

The water crisis is, no doubt, one of the worst ever, though dry spells are a familiar occurrence. Large parts of Gujarat, particularly Saurashtra and Kutch, are drought prone. The Sardar Sarovar project on the Narmada was conceived as the answer to the state's water problems, but it is still caught in a legal dispute. The water is still flowing into the sea. Last week, when the river was in spate after heavy rain in its catchment area in Madhya Pradesh, 200 lakh acre feet of water flowed into the sea which, according to Narmada development Minister Jaynarayan Vyas, would have been sufficient for Kutch, Saurashtra and North Gujarat for 10 years.

While the Narmada project languished, borewells became the government's standard response to water problems. The result: water tables have been falling in the state. According to the CGWB, in north Gujarat – including Ahmedabad – water tables are dropping at an alarming rate of over seven feet every year because of over-exploitation. In several areas in North Gujarat, water is to be got only by digging as deep as 500 to 700 feet. How long will even this water last?

In fact, in many areas, rechargeable reservoirs of groundwater were pumped dry long ago. Now, water, which has collected in the deeper recesses of the earth for

hundreds of years, is being pumped out. It has a high content of dissolved minerals and is unfit for drinking. The use of this mineral rich groundwater has led to the spread of fluorosis in Amreli in Saurasthra and at several places in North Gujarat.

A CGWB report entitled Ground Water Resources of Gujarat points to another danger. "Groundwater withdrawal requires to be regulated so that it does not exceed the annual recharge and also does not disturb the hydrochemical balance leading to sea water ingress," it says. In fact, salinity has already become a major problem in coastal areas.

(Indian Express, 15.10.1999, Darshan Desai)

(Water Crisis / Ground Water Hydrology / Drought Management, Gujarat)

IE4) Human survival more important than environment: Minister

Gujarat Water Supply Minister Narottam Patel has justified the government's decision to dig 120 bore-wells in the environmentally sensitive Wankaner-Jasdan region to supply drinking water to Rajkot City,

Former Union Minister for environment and scion of the erstwhile ruling family of Wankaner, Digvijay Singh, had threatened to file public interest litigation against the digging of bore-wells. Patel said that work on the Rs.67-crore project was proceeding on a war-footing and water would reach Rajkot through the 80-km. long pipeline by October 5. "Environmentalists and experts may argue that tapping groundwater tables will cause immense damage to the environment and result in desertification of the region. But do they have any suggestions on how to quench the thirst of the millions of people?" he asked.

When it was pointed out that the centuries old underground reservoir, if depleted, would take several hundred years to be replenished, the Minister retorted, "But what about the immediate problem posed by the acute drinking water shortage in Rajkot City?" However, Patel said that once the drinking water problem eased with the next monsoons, the bore-wells sunk in the Wankaner-Jasdan region could be closed. After the pipeline becomes functional on October 5, he said, Rajkot city would start receiving 50 million litres of water every day. "Each residents of the city will receive 120 litres of water on alternate days," he said.

(Indian Express, 16.9.1999)

(Water Crisis / Environmental Hydrology, (Rajkot) Gujarat)

IE5) Gujarat dams left with less than 10 pc of water

Gujarat is in for a severe water crisis. Even as the monsoon is on the retreat, the 113 dams in Saurashtra have less than 10 percent of their total storage capacity. The situation is no better in north Gujarat and parts of central Gujarat.

A note prepared by the Water Supply Department says: "If the last round of the monsoon, which is expected in end-August/early September fails, north Gujarat and Saurashtra, in particular, and also some part of central Gujarat, are likely to see an unprecedented drinking water crisis."

This time, on September 7, just about 218.02 million cubic meter (MCM) water was left in dams in Saurashtra against the storage capacity of 2229.07 mcm, which is 9.78 per cent. On the same day last year, there was 923.04 mcm water.

In north Gujarat, Ahmedabad district has no reserve against a capacity of 10.49 mcm. The same goes for Mehsana which has a capacity of 735.05 mcm, Banaskantha has 9.69 mcm against a capacity of 586.24 mcm, while Sabarkantha has 88 mcm against 502 mcm. In central Gujarat, Vadodara has 23 mcm against a capacity of 173 mcm, Dahod has 542 mcm against a capacity of 1,637 mcm, Panchmahal has 395 mcm against a capacity of 800 mcm. Together, the affected areas constitute two-thirds of the state.

Only south Gujarat is unaffected; the region has quite a few perennial rivers, like Narmada and Tapti, and also received good rains. In Kutch, the situation is a little better, with a reserve of 104.90 mcm against storage capacity of 264.54 mcm, thanks ironically to the cyclone in June.

Not one government since independence has done anything for them, they claim. Their list of demands, in what they call their fight for justice, includes repair of the village well, a handpump to provide drinking water for the village, construction of a water tank, road connection for the village and a bridge to enable access to the school across the pond, besides several other similar basic necessities.

(Indian Express, 10.9.1999)

(Water Crisis, Rajasthan)

IE6) A daughter of the soil, she turns arid land into forests

A 56-year old woman, Tulasi, from a little-known tribe in a little-known village, has won the Honniah Award for Excellence in Service. She has single handedly,

selflessly turned an entire hillock in Karwar into a lush forest and is continuing to put her green thumbs to work in other areas nearby.

For this woman of the Hallaki Gowda tribe, there was nothing special about her accomplishment. "I do what I love most, collect seeds from the forest, and nurture my nursery to cover all the barren tracts in Karwar," is all she said.

Thirty-seven years of experience in the deep woods has made Tulasi a walking encyclopedia. But she knows little about the Kaiga and other development work, which has denuded forest cover. Her only concern is to pick the best of seeds for germination, which will make her little green world all the richer.

Former forest official and renowned environmentalist A N Yellappa Reddy has spoken about Tulasi's contributions in his writings; that and her recent award has made here one daughter of the soil who has not gone unsung.

(Indian Express, 9.9.1999)

(Forest Hydrology)

IE7) More 'Dam' Facts - Few facts about big dams

Since it's next to impossible for a mere mortal to match Arundhati Roy's facility with the language, the economist Surjit Bhalla has combatted Arundhati Roy's explosive treatise with a combination of facts and sarcasm. Using her own source, a study by the IIPA, he arrives at a patently absurd figure for the number of those displaced by dams - an incredible 145 million, which means every fourth person you meet is a displaced dam person or her descendant!

There are more 'dam' facts, which don't usually come up while damning big dams and glorifying the alternatives such as solar or wind energy, smaller dams, energy-efficient light bulbs, clean coal-based power and so on, Samplers:

- ☉ Solar power is certainly clean, but there are no established plants over the size of 1MW anywhere in the world. Also, solar power costs Rs.40 crore a MW as opposed to, say, Rs.3.9 crore for the Maheshwar power project, one of the stops along the way for Roy's Rally for the Valley. And putting solar panels across the land, as you have to, requires 5 hectares of land per MW, or roughly the same as a dam project.
- ☉ Wind power costs around Rs.4 crore a MW, but requires even more land - India's

experience with wind power also shows that windmills draw more energy from the grid to start up than they actually contribute.

- ⊖ Compact fluorescent bulbs are appealing solutions, but replacing conventional ones with them will cost a packet since the bulbs cost 40 times more. Simple arithmetic tells you that to generate savings of energy equivalent to a 1 MW power plant, you need to invest Rs.134 crore in such energy-saving equipment! That's Rs.134 crore per MW as against Rs.4 crore for hydel power.
- ⊖ Hydel projects cost around the same or marginally more than thermal ones to construct but are far cheaper in the long run. Hydel projects such as the Salal project, for example, generate power at a cost of 32 paise per unit as against 76 paise for the Singrauli thermal projects. And if you want to use average figures, in 1997-98, the average cost of hydel power for 10 major state electricity boards was 48 paise as against 159 paise for thermal ones.
- ⊖ Information from the Ministry of Water Resources shows that while large dams submerge larger tracts of land than smaller ones, if you look at the submergence per unit of storage capacity (which is the right thing to do), large dams submerge 9.74 hectares per million cubic metres as against 24 for smaller dams - economists call this economies of scale, or the God of Large Things.
- ⊖ Studies by B S K Naidu who used to head the Indian Renewable Energy Development Agency show that negative impact of hydro projects is much less than that of thermal ones. The negative aspects of hydro projects, are obvious - impact on reduction in forest cover, displacement and so on.
- ⊖ That for thermal projects includes greenhouse effect, generation of ash, water pollution, etc. Based on this, hydro projects are found to be less harmful than thermal in the ratio 3:7.

(Indian Express. 6.9.1999)

(Dam Hydrology)

IE8) Where has monsoon gone?

In the current monsoon season, beginning June 1, Delhi has so far recorded only 251 mm of rainfall, which is 175 mm short of the calculated normal value for the corresponding period.

The month of August, which usually accounts for the biggest share of the total monsoon rainfall in the Capital, has been a great disappointment this year. So far only 65 mm rainfall has been recorded in August. This value is less than one-fourth of the rainfall recorded in the same month in the last five years.

The Director of the India Meteorological Department, S C Gupta, blames the distant seas for the problem. "This year not a single system from the Bay of Bengal could arrive in Delhi and effect rains," he says. Meteorological systems such as a low pressure area or depressions originate in the Bay of Bengal and generally move towards Bihar and finally the hills of West Uttar Pradesh to effect good rainfall all over northern India. "This year, all such systems moved southwards from Bihar and caused rains in Madhya Pradesh and South Rajasthan depriving the northern region of good rainfall activity," said Gupta.

With a bad record so far, the coming days also does not seem to be very promising. "At least for a few days there are no chances of good rainfall in the city. Some disturbance has been reported in eastern Uttar Pradesh. However, that too, will, at the most, cause thundershowers," he added.

(Indian Express. 31.8.1999. IMD)

(Surface Water Hydrology / Climatology, Delhi)

IE9) Water, not promises, will sway Gujarat voters

And whoever manages to sort out the acute shortage of this precious commodity will be rewarded handsomely with the lifetime loyalty of voters cutting across all divides.

Drinking water has always been a problem for the people of Surendranagar district. Promises have been made aplenty, but none have been delivered on. The candidate who comes up with a concrete proposal for a lifetime solution for drinking water will be our candidate for his entire life."

The solution to the crisis, says Karansinh Khumansinh, is the Narmada Dam. "It seems, though, that no politician has the guts to see the project through," he says.

(Indian Express. 30.8.99)

(Urban Hydrology, Surendranagar (Gujarat), Narmada Dam / River)

IE10) 'I feel I'm rinsing my mouth in a gutter'

Thirteen years old Shoa Shaikh is scared to open the tap at her home on

Byculla's up-market Clare Road in the morning to brush her teeth. You never know what may come out of it. The worms stopped emerging a while ago but the water supplied by the Brihanmumbai Municipal Corporation (BMC) remains filthy; looks a muddy yellow and smells of faeces.

"It almost feels like I'm rinsing my mouth in a gutter", says Shaikh, who has just recovered from a bout of typhoid. She is one of the residents of at least seven buildings, housing nearly 140 flats, on Clare Road who have all but sealed their taps for the past three months. The civic authorities, all this while, claim to have been testing samples.

Another resident, says the BMC has advised them to keep their taps open for about half an hour in the mornings so that the yellowish water flows out. However, the gutter smell remains throughout the day. Residents of Satnam, Piccadilly and Oxford Chamber buildings, also on Clare Road, have been told to do the same.

Admitting that the source of the contaminated water had not yet been found, "E' Ward Officer K.V. Acharekar claims: "We have started identifying the cracks and leaks in the pipelines, but the reports of water-sample testing are not known". He says the BMC Health Department has also been intimidated.

(Indian Express, 12.8.1999)

(Water Quality, Maharashtra)

IE11) Wanted: Rain, and lots of it, at Ajwa dam

Unless there is exceptionally heavy rain in the next two months, the Ajwa water reservoir - which caters to 20 per cent of the city's needs - may not last till the next monsoon. And the VMC may have to drop a pet water supply plan.

The water level at Ajwa is currently 206.11 feet; by the end of the monsoons, it must stand at a minimum of 211 feet to last till the next rains. The past couple of years' experience doesn't leave much scope for optimism; at the end of July, the water level has been no more than 208 feet.

Out of the city's total supply of about 52-54 mgd (million gallons per day), Ajwa provides 10 mgd and french wells in Mahisagar 42 mgd; the rest comes from borewells. Top officials at the VMC, going by simple calculation that the water table in the reservoir depletes by an average of one foot every month, say the water body is at least two months' rainfall behind normal. The rains have been a major disappointment this year, the total rainfall till end-July was 216 mm. In 1997 it was 612 mm, in 1998, 518

mm. Experts say that even if the rains are fairly good in the second half, there's simply too much slack to pull in.

If the water level does not reach the 2135 foot mark by the end of the monsoon, the VMC will have to delay its ambitious plans to draw an additional 10 mgd water from Ajwa through the filtration plant at Nimeta, scheduled for December. The VMC is working out an alternative. Trapasia says nothing can be revealed at present for fear of spreading panic. And even if Ajwa does fail, all is not lost. The VMC can divert Mahisagar water to the Panigate and Gajrawadi water tanks. The Waghodia tank can be catered to with minimum additional infrastructure. The problem area will be Tarsali, which is not connectable in the near future with any water body other than Ajwa.

(Indian Express, 8.8.1999)

(Dam Hydrology/ Urban Hydrology, Gujarat, Ajwa Dam)

IE12) Damming the Dam

Waters of the Narmada and its tributaries and claim that it will provide large amounts of water and electricity for development.

- www.sardarsarovardam.com: Get the Gujarat and Rajasthan governments' perspective on their official site. Learn about resettlement, rehabilitation and the environmental protection measures. The project provides assured irrigation to 4.45 million acre in Gujarat and 185,000 acre in Rajasthan's Barmer and Jalore districts. They say 8,215 villages and 136 towns in Saurashtra, North Gujarat and Kutch and 131 villages in Barmer and Jalore districts will get drinking water.
- www.edf.org/pubs/newsreleases/1998/feb/b-dams.html: The official site of the World Commission on Dams reviews the environmental, social and economic impact of large dams. The commission studies the impact of large dams in the US and the world. The anticipated budget of the commission is \$8.4 million.
- www.foil.org/economy/ecology/nbapg.html: The Narmada page outlines the struggle to save the valley.

(Indian Express, 8.8.1999)

(Dam Hydrology, Gujarat & Rajasthan)

IE13) Saurashtra in grip of water shortage as monsoons fail

Water has become a precious commodity in Saurashtra these days. With even

the tail-end of the failed monsoon playing truant, the entire Saurashtra region, barring Junagadh district, has been gripped by severe water scarcity. Dams are dry, and water from other sources is getting scarcer by the day.

Surendranagar is on the verge of a drought. The Dholidhayra dam, the main source of water, has gone dry and the government has been forced to review the situation and release Rs.20 crore for sinking bore wells and laying pipelines. Residents are supplied drinking water once in seven days. The situation is even worse in the interior villages of this drought-prone district. Women walk several kilometres daily to fetch a few potfuls of turbid water from water holes. The water is dirty, unpotable and reportedly causes diarrhoea.

In Rajkot and adjoining Jetpur, water is brought by train from Ahmedabad and Gandhinagar. The Rajkot Municipal Corporation says it has enough water to last a month, if used sparingly. The situation is much the same in Jamnagar, where water is piped every alternate day. Municipal Commissioner Pankaj Joshi says the water from the Und Dam may sustain the residents a couple of months more with rationing. "After that we will have problems," he said.

A good first spell of rain eased the pressure on Amreli municipality, as the water level rose in the Khodiyar Dam, enough to last several months. However, the interior tluks of Babara, Liliya, Lathi and Jafrabad continue to face scarcity. One problem that the villagers here face is the high fluoride content in the ground water, which means it cannot be used for domestic purposes.

According to the district administration, the only hope for villagers here is the tanker chagdas which charges 50 for about 150 litres of water. Porbandar is receiving about 16 lakh gallons daily, which is barely sufficient. According to collector Mahesh Joshi, the receding water levels at Khabha and Khoda dams is a worrying factor.

The delayed rain has also created a fear of failure of crops, which have already been sown on a month ago. Farmers are still waiting for rains to irrigate their fields. Figures indicate that about 500 tankers are plying to provide drinking water to 714 villages in seven districts of Saurashtra and Kutch region. About 1,685 villages are facing drinking water problem and district level committees have asked for sanctions to ply a total of 1,062 tankers in the villages.

(Indian Express, 3.8.1999)

(Potable Water, Gujarat)

IE14) As last resort, Govt. to conduct experiments for artificial rain

The State Government has initiated efforts to create artificial rain in five districts - Rajkot, Jamnagar, Amreli, Kutch and Banaskatha - with the monsoon having miserably failed in Saurashtra region.

The condensation of clouds will continue for the next nine days, and the experiment will be carried out at dawn and later in the evenings. The experiment involves releasing a cloud of sodium iodide from an aircraft about six to seven kms. above sea level between the natural clouds. This generates heat upto 650 degrees Celsius among the clouds, which might result in condensation. This, in turn, would lead to rains.

The project has been started by the State Agriculture Department. Agriculture Minister Becharbhai Bhadani and officials of the department consulted a non-governmental institute, Kutchi Visha Oswal Jain Mahajan Sangh, which carries out such projects every year in Kutch district. The project has been partially successful in the last seven years, as per the statistics of the Institute.

(Indian Express, 3.8.1999)

(Artificial Rain, Gujarat)

IE15) An island marooned in monsoon waits for a clean Ganga plan

It may sound strange but an unlikely group of people is monitoring a proposal of the Ganga Action Plan, phase II. They live in the Sota island and follow the progress of the report through every bureaucratic channel.

It is not that these 40,000 people are more concerned about the pollution level in Ganga but if the plan prepared by the Swatcha Ganga Campaign is approved, it will change their lives. The 14-kilometre long and two-kilo-metre broad landmass becomes an island with the Ganga water flooding it on its northern side during the monsoon months, cutting it from civilization completely.

As the course of the Ganga gradually shifted over centuries towards the south-east, it exposed a former channel, which is barren, infertile and is classified as 'desert land' in the government books. The result is that the area has been completely forgotten, pushed out from the map of development.

(Indian Express, 30.7.1999)

(Water quality, Uttar Pradesh, Sota Island)

IE16) Rain harvesting scheme yet to take off in the Capital

Rooftop rainwater harvesting is collecting rainwater from the roof of buildings and storing it in a ground water reservoir for future use to survive Delhi summers. In an ambitious and well-publicised plan to promote rainwater harvesting, the INTACH with the help of the authority had identified certain areas in the city where the scheme could be carried out. Later, in June this year, chief minister Shiela Dikshit had proposed that the government would aid in financing the schemes and would even offer subsidies to individuals to set it up. A month later, the scheme has been reduced to that of a damp squib with the residents left to finance it wholly.

The project is going to cost him anywhere between a modest Rs.1,500 using an abandoned well as a recharge structure to a prohibitive Rs.85,000 which involves the digging of a recharge shaft. The schemes aim at recycling and conserving all available surface water and also augmenting the ground water recharge through artificial measures. Unplanned withdrawal of ground water has resulted in fall in water level and deterioration in quality of ground water.

The CGWB has been involved in conducting harvesting experiments in IIT Delhi during 1998 and has built check dams in JNU. The scheme is a community-oriented package and special offers were to be evolved for individuals. But the cost involved is heavy and the lack of incentives for individual action is going to see a good scheme fizzling out. "We are a government department and our role is helping with advice. As for keeping track, it is not up to us. We hope that since they have been so many enquiries, we will know something by next year," say officers here.

(Indian Express, 29.7.1999)

(Water harvesting, Delhi)

IE17) Boat capsizes kills 12 in Bihar floods

The embankment of the Kosi near Jhakarahi had been partially damaged near Jhakarahi while the slope of Maujaha had been washed away, the department sources said. They added that repair work was in progress. The Kosi was rising menacingly at Basua and Baltara crossing the danger level by 30-cm and 112-cm respectively, sources said. The embankments of the swollen Burhi Gandak, which was also in spate following moderate to heavy rains in its catchment areas in Nepal.

(Indian Express, 27.7.1999)

(Flood Hydrology, Bihar, Kosi River)

IE18) Water level falls at Bhakra dam

Due to a prolonged dry spell, water level at the Bhakra Dam reservoir has gone down by almost 50 feet. Sources in the Irrigation Department confirmed that the water level at the Bhakra dam was almost 50 feet below the 1,615.57 feet level, which was recorded last year. A daily gauge report, reaching at the Sirhind canal headworks here revealed the water level at 1,570.70 feet, which was 44.87 feet below the water level recorded during the previous year. The report also puts the total water capacity in the dam at 30,70,451 cusecs whereas the capacity recorded last year was 42,56,933 cusecs. The lowest-ever water level recorded at Bhakra dam since 1987 was 1,4771.91 feet in June 1997.

Inordinate delay in rains may further aggravate the crisis, leading to power shortage in the region. This may also affect irrigation in Bhatinda, Sidhwan, Abohar and Patiala areas as the water is fed to these belts through the Sirhind canal. The water level should not go below the required 1,600 feet at the reservoir for adequate power generation in the region and cultivation of crops.

(Indian Express, 19.7.1999)

(Reservoir Operation / Surface water Hydrology, Bhakra Dam)

IE19) AP puts off release of water to Chennai as Cong, TDP indulge in war of water

The release of drinking water to Chennai through the Telugu Ganga project has been put off with it turning into a political controversy. Though 3 tmc of water was to be released as per the earlier schedule, it has been put off in view of tension prevailing in the district due to the indefinite hunger strike undertaken by local Congress leader. While Congress leaders have been demanding supply of water for a second crop under the Kandaleru reservoir before release to Chennai, the TDP maintains that there is sufficient water in the reservoir.

(Indian Express, 9.7.1999)

(Inter-basin water transfer, Andhra Pradesh, Kandaleru reservoir)

10.0 CONCLUDING REMARKS

Water is going to be the main and crucial issue of the 21st century as a principle resource as well as a potential source of conflict. In India, this increase in water stress will be more because of the impact on the economy of the necessary adjustments will be significant. Reports indicate that the demand of water will continue to rise as population and per capita consumption rate increase, but growing population is likely

to reduce the quantity of water, of suitable quality, that is available. Further, the competition will increase between sectors such as irrigated agriculture and industrial / urban uses for the limited supply. The problems are many and vary over space and time.

Keeping this in view, an attempt has been made to highlight some of the major hydrologic events taken place during 1999-2000 in the India to disseminate, propagate and to create awareness about these problems among hydrologists, managers and planners of water resources. It can be seen from the news clips that the problems are different in different basins and they vary over space and time.

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