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HYDROLOGICAL PROBLEMS OF INDIA- A COMPILATION OF NEWS ITEMS FOR THE YEAR 2000

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PREFACE

The projected population by the mid-century shall bring the country to a high water stress situation. The gap between demand and supply shall widen. The hydrological problems of the country are always varying with different factors. The recurring floods in one part and the droughts in another parts in India are common. Our water and land resources are limited due to steady rise of population and improvement of the standard of living. During last two decades or so, requirement of water is increasing continuously. Water quality, erosion, ground water table, water logging, drought and Floods are the main problems of the country. In India there is enough water to sustain the population of the country, Yet there are a number of difficulties in actually accessing the available sources of water. Almost half of the water of the coastal minor and medium rivers cannot be harnessed and is inevitably wasted. In fact, the area under cultivation south of the country has inadequate water resources and conflicts are bound to occur over control and optimal administration of water resources. Besides the problem of growing demand for freshwater and the deteriorating quality of water available, water managers today are at their fingers crossed in view of a long term climate change and its impacts on water resources. While it is important to augment the efficiency of water use, it is equally important to access future hydrological changes as consequences of greenhouse warming.

Recognizing the importance of news items appearing in selected news papers and realizing the need for compilation of such news items, the Institute has decided that every year all the important and relevant news shall be collected and compiled in the form of a report. 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 2000. All the information about the various hydrologic problems has been categorised within twenty-four hydrological sub-fields (Table 1). Sometimes, the news published in newspapers is cut down, if it is too large or beyond use, but the paper cuttings are available with the author. Also a matrix of the hydrological basins vs. content positions is prepared and given in Table 2.

This report entitled **"Hydrological Problems of India –A Compilation of News Items for Year 2000"** is a part of the work program of the Hydrological Information System Division of the Institute for the year 2000-2001. **Dr. (Mrs.) Rama Devi Mehta, Scientist 'B'** of the Division, carried out this compilation study.

K S RAMASASTRI
Director

CONTENTS

Abstract

There is already a major nationwide shortages of fresh water and the deficit is set to rise, although world availability of potable water greatly exceeds the amounts needed, resources are not evenly distributed. According to the survey, while demand rises for potable water, pollution of natural water supplies is increasing.

Increasing demand of water and decreasing availability would place additional stress on people, agriculture and the environment, more so in developing countries. Climate change will exacerbate the stress caused by pollution and by growing population and economics. In view of the proper utilization and management of water resources in the country, it is must to have sound information about available resources, discreet planning for tapping the wasted resources and demand and availability of each state. This report is a compilation of Hydrological news of the year 2000 through print media throughout the country. These news have been categorized in 24 hydrological subfields. Two matrices of hydrological problem vs. content positions and Hydrological basins versus content positions have been given just after it. A list of all problems with their area, date and source has been given after the introduction for the user's convenience.

National newspapers like Hindustan Times, Indian Express and Hindu have been referred to get the Indian Hydrological events due to flood, drought, quality, demand supply and availability etc.

List of Tables

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

S. No.	Topics	Content Numbers
1.	Ground Water Hydrology	IE6, IE21, IE22, H36, H37, H39, IE29, H50, IE40, IE44, H59, H71.
2.	Surface Water Hydrology	H32, IE20, IE42, H73
3.	Land / Soil Erosion	
4.	Drought Management	IE5, H11, H30, H31, IE19, H48, H52, H53, H54, H56, DH4, HT3
5.	Water Pollution/ Water Quality	IE3, H6, IE4, H10, H16, IE16, H34, DH2, H45, H50, IE47, IE48, IE49, IE50, H67, H69, H70, H71, HT2, H80
6.	Flash Flood/ Flood Hydrology	H3, H20, H24, H26, IE15, H27, IE20, H33, H60
7.	Water Policy /Bill / Water Management	H1, H2, H8, H19, H22, IE25, IE26, H39, IE28, IE31, IE36, H52, IE39, IE46, H57, H63, IE51, H66, IE53, H68, IE55
8.	Environmental Hydrology	H18, H35, IE52
9.	Watershed Hydrology	H74
10.	Forest Hydrology	IE58
11.	Waterlogging / Soil Salinity	H23, IE21
12.	Industrial Effluents – Treatment plants	H6, IE4, IE22, DH2, H58, IE47, IE48, H80
13.	Water Crisis	IE12, H29, IE18, IE19, IE28, H51, H53, IE38, IE44, IE56
14.	Water Harvesting/ Water Conservation	IE13, IE14, IE23, IE27, H38, H42, H43, H44, H46, IE32, H48, IE37, H55, IE43, H62, H65, IE54
15.	Lake Hydrology / Lake	H35, IE42, IE45, H61

	Pollution	
16.	Water Availability	IE8, IE10, H14, IE17, IE30, IE33, IE34, IE35, IE41, HT1
17.	Mountain Hydrology	IE57
18.	Potable Water	H4, H5, H34, H40, H45, H47, H49, H61, H67, HT1
19.	Recycling of Water	H47, IE34
20.	Inter-basin Water Transfer	H72, H76
21.	Remote-Sensing Applications	H36, H64
22.	Dam Hydrology	IE1, IE2, H7, H9, H12, H13, IE7, H15, IE9, H17, H21, H25, H28, IE18, DH1, IE24, H41, DH3, H75, H77, H78, H79
23.	Indian Ocean / Sea water Intrusion	IE11
24.	Urban Hydrology	H38, IE53, H66

Table 2: Hydrological Problems of Specific Basins versus Content Positions

S.No.	Specific Basins	Content Positions
1.	Almatti Dam/ Reservoir	DH1, DH3, H12, H32, H79
2.	Ajwa Reservoir/ Dam, Gujarat	IE34
3.	Bargi Dam	H25
4.	Bhakra-Beas	IE33
5.	Cauvery	H72
6.	Fatehsagar Lake	H61
7.	Ganga	H72

8.	Godavari	H33
9.	Harika Lake	H35
10.	Indira Canal	H67
11.	Khari Canal	IE4
12.	Krishna River	H8, H76
13.	Koyna Dam	H21
14.	Kadana Dam	IE35
15.	Kankana Lake	IE45
16.	Kali River	H69
17.	Mahi Dam	H41
18.	Maheshwar Dam	H77
19.	Maskinala River Project	H78
20.	Nagari Project	H8
21.	Nagarjunasagar Dam,	H12
22.	Narmada	H13,IE8, H15
23.	Periyar Dam, Kerala	H17
24.	Pichhola Lake	H61
25.	Pirana Treatment Plant	IE4
26.	Saraswati river	H37
27.	Sardar Sarover Project	IE10
28.	Tungbhadra Dam	H75
29.	Wardha River	IE31
30.	Yamuna	H10, IE47, IE48, H80

Problem Index with Titles Source & date — Page No.

September, 2000

August, 2000

June, 2000

May, 2000

April, 2000

March, 2000

February, 2000

January, 2000

1.0 Introduction

The news through the print media in many ways is the pyramid of collection of information. It is a key to a country. This is very true in case of natural resources of a country. Demand for water varies greatly in different parts of the country; it depends on population and on the prevailing level and pattern of socio-economic development. Water, as the medium of life has been a well-recognised fact 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.

Recognizing the importance of news items appearing in selected news papers and realizing the need for compilation of such news items, the Institute has decided that every year all the important and relevant news shall be collected and compiled in the form of a report. Keeping this in view, the hydrological news available from print media for 2000 have been collected and complied in this report problem wise and basin wise for the whole country. Four national newspapers have been referred for this purpose and the available news have been categorised in 24 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 the form of a Table. Another Table serves as a matrix to indicate the water bodies where the different problems have taken place. Hence, the reader can easily go through the reported hydrologic events according to different classified problems subject-wise and basin-wise.

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 limited compilation of the hydrological news. The feedback from it can generate significant benefits to operation and management that are difficult to define in advance. Details about the long-pending and on-going hydrological projects have also been discussed here.

2.0 Sample Layout of a Content

H2) is the News Numbers used, here, 'H' stands for 'The Hindu'

Title taken from Newspaper by Author,

H2) Mismanagement of water dangerous: Krishan Kant

The quintessential image of a rural woman burdened with a pitcher of water on her head to meet the water requirements of her household was unwittingly reinforced today at an international seminar on 'Women and Water' organized by the Central Ground Water Board (CGWB) under the Ministry of Water Resources. Everybody recognized the fact that rural women spent most of their day and life fetching water for daily chores and under scored the need to use women in planning, developing, and managing water at community level.

Contents Of the News

It was left to the chief guest, the Vice- President, Mr. Krishan Kant, to rise above the patronizing tone of various Ministries at the inaugural function towards women and remind the Government of its failure to address the problem of water scarcity in rural and hilly areas and unequal distribution of water between urban and rural areas.

Mr. Krishan Kant said: " Women pay a heavy price for the so-called march of civilization, bereft of environmental sensitivity. Each time water becomes polluted or scarce, the rural women is required to trudge a longer distance to fetch water of progressively diminishing purity".

(The Hindu- 10/12/2000, International Seminar)

(Water Management/ Water Crisis, New Delhi,)

Name of the Newspaper, Date of the Publication, Source

1st Category under Hyd. Problems,

2nd Category under Hyd. Problems

Related State/ States

Related Water Body (if any)

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

3.0 News Contents From the News Papers (Month–wise)

December, 2000

IE(1) Check Dams Failed In Gujarat: Expert

Small might not necessarily be beautiful when it comes to the size of dams. Check dams constructed in Gujarat to deal with the drought-like conditions have not been very effective, says Prof. V.S Subramanian of the School of Environmental Studies at the Jawaharlal Nehru University. The failure of rains in 1999 gave rise to a large number of check dams, particularly in Saurashtra. Small dams had preserved less water after rainfall in the state. " The percentage of water accumulated, in comparison to their total capacity, was very less in small dams as compared to big ones," Subramanian observed.

He pointed out that a small dam was filled to only about 20 to 25 % of its capacity, while a large dam stored between 60 to 75 % of its capacity. In addition, large dams had the capacity to face environmental changes and vagaries of nature.

In his opinion, large dams are necessary in a country like India because they also generate large quantities of electricity. " Small dams generate only a limited amount of electricity, which is insufficient for a country like ours where power shortage is a major handicap in development. He said that large dams are required but resettlement needs to be taken care of.

He said it is wrong for developed countries to oppose the construction of large dams. " They have reached a particular level of development and can now afford to speak against such projects."

(Indian Express, 16/12/2000)

(Dam Hydrology, Gujarat)

IE(2) Revisiting a Controversy – Let Science do the Talking of Dams

The Stockholm conference of 1971 and the subsequent UN resolutions on the preservation of atmosphere and preventation of pollution saw a large number of groups emerging. They saw themselves as environmentalists and found an easy target in the irrigation projects of the period like the Narmada and Tehri dams. Yet, despite 20 years and more of activism of this kind, a proper assessment of dams has still not emerged.

There is no getting away from the fact that a large number of dams, such as the Bhakra, Hirakud, Nagarjunasagar, and so on, has generated electric power for the industrial sector and ensured water for irrigation. This may not, in itself, have removed poverty but it has definitely paid the desired dividends in the form of a rise in living standards, as well as agricultural and industrial production. So the pro-dam lobby is quite right in emphasising this. However, the aspects highlighted by the anti-dam lobbyists, such as water logging, salt-water ingress, the adverse effect on biological and zoological species, reservoir induced seismicity, submergence of forests, and so on, require a considered scientific response and not a flat authoritarian refusal to listen. What makes things worse

is that the debate between the pro-dam and anti-dam lobbies has deteriorated into a slinging match with vital issues being all but forgotten in the process.

As far as submergence of forests and the effect on biodiversity is concerned, undeniably there will be some losses. However, this will certainly not result in the total extinction of the biodiversity of the region. In fact, the rise in population and urbanisation pose a greater threat to the biodiversity than do the dams. The disproportional expansion in urban limits have affected a large number of rivers, lakes, estuarine areas, agricultural lands, forests, and so on and requires the urgent attention of conservationists. Yet hardly any voices of concern have been raised regarding this danger.

Let us now come to the crucial question of Reservoir Induced Seismicity (RIS). This aspect first came into play when an earthquake of 6.5 magnitude visited the vicinity of the Koyna dam in Maharasthra on Dec.10, 1967. At that time, It was thought that the landmass of peninsular India was free from any earthquake and the area was considered a seismic. As the epicentre of the earthquake happened to be in the proximity of the dam, an ad-hoc hypothesis propounded that the combined effect of the load of the water body on the rocky environment and the trickling of water down the rocks had resulted in the earthquake. In absence of any proper scientific explanation, a large number of people and a few seismologists came to accept this catchy hypothesis.

There has also been widespread concern expressed over the long-term viability of dams, given the fact that siltation is an acknowledge problem. It is a fact that the rate of silting assumed by experts, based on the past records of the Central Water Commission, are definitely subject to correction and require some elements of modification. But the sediment data for the last two decades are sufficiently reliable. The lives of the dams could be re-estimated on the basis of sediment data gardened over the last 20 to 25 years.

Whenever there is an element of risk. Risk is an unavoidable part of construction. Therefore, every effort must be made to address every possible risk while designing the dam and allied structures. It is felt that although anti-dam activists have raised some very pertinent issues, the benefit to be derived from dams are so many that instead of dismissing them outright, it would make more sense for scientists and engineers to try and address the concerns.

(The writer is a research Seismologist and was formerly head, Earthquake Engg. Res. Div, at the Central Water Power Research Station (CWPRS), Pune.

(Indian Express, 15/12/2000, Arun Bapat)

(Dam Hydrology, General)

H(1) Evaluate impact of water policies on women

The two- day international seminar on Women and Water today continued its ode to the rural women for going through the drudgery of traversing long distances to fetch water. The Union Agriculture Minister, Mr. Nitish Kumar, in his valedictory remarks said, " the rural women may eventually show the world how to nurture earth and save the planet." In the end it looked as if the load on rural women's head had been made heavier, not lighter.

Fortunately, the seminar recognised "an urgent need" to evaluate the impact of current water policies on women and make changes, as necessary, to facilitate women as change agents in the conversation and management of water resources.

Experts and officials observed that "although women and water have been interwoven as the basic fabric of human development, yet women have never been empowered to make decisions nor her capacity built to manage resources." To make up, the seminar recommended initiating gender sensitive strategies to enable women to fully participate in water conversation and management.

The seminar also recognized "The potential of women" identify problems related to water caused by environmental degradation and implementing programmes. Their ingenuity in developing solutions is therefore essential, because so much of their daily time is spent in getting and using water," it was noted.

But more importantly, it was suggested that the Central Ground Water Board should take up about 100 target area "on a war footing" in drought- prone and hilly areas for water resources development and management including water harvesting to create permanent drinking water facilities.

The need for developing strategies for involving women inventions such as awareness campaigns, training and monitoring capacity building was under scored. The Central Ground Water Board could set up a cell for training and education in various aspects of water resources development and management. Gender sensitivity should be cultivated as part of human resource development.

"Women have to be motivated and their capacity built to under- take operation and maintenance of water supply schemes at community level through suitable income generating schemes," the seminar observed. But how this would be done was not specified. It was also recommended that the Central Ground Water Authority, a regulatory body, should empower women voluntary groups and water user associations in regulating ground water development at village and Panchayat level.

"The active participation of women in rain water harvesting and recharging of ground water are important planning options for sustainability of this endangered resource," said Mr. Som Pal, member, Planning Commission. In her valedictory remarks, the Minister of State for Water Resources, Ms. Bijoya Chakravarty, said women, as primary stakeholders in the water sector should play an important role in the conservation and management of water resources, rainwater harvesting and preventing ground water pollution.

(The Hindu- 11/12/2000, Seminar)

(Water policies, New Delhi)

H(2) Mismanagement of water dangerous: Krishan Kant

The quintessential image of a rural woman burdened with a pitcher of water on her head to meet the water requirements of her household was unwittingly reinforced today at an international seminar on 'Women and Water' organized by the Central Ground Water Board (CGWB) under the Ministry of Water Resources. Everybody recognized the fact that rural women spent most of their day and life fetching water for daily chores and under scored the need to use women in planning, developing, and managing water at community level.

It was left to the chief guest, the Vice- President Mr. Krishan Kant, to rise above the patronising tone of various Ministries at the inaugural function towards women and remind the Government of its failure to address the problem of water scarcity in rural and hilly areas and unequal distribution of water between urban and rural areas.

"We must wake up to the dangers of unplanned management of water. Water management in any society has to be undertaken as part of a large plan which should include a strategy for the preservation of the ecology and environment with community action at local and regional levels for water preservation such as watershed management," he said.

Mr. Krishan Kant said: " Women pay a heavy price for the so- called march of civilization, bereft of environmental sensitivity. Each time water becomes polluted or scarce, the rural women is required to trudge a longer distance to fetch water of progressively diminishing purity, and in smaller quantities to meet the family's need which also include the needs of cattle, washing and cleaning whereas 70 per cent of water in tanks, lakes and underground resources is used for irrigation and to meet daily needs."

It is estimated that India, along with 20 other countries, will face severe water stress in the next quarter century. Of the 5.6 million villages in the country, over 50 per cent lack safe drinking water. The per capita availability of water is 2,200 cubic metres, which is far lower than per capita global availability of 8,500 cubic metres.

Despite being billed as an international seminar with themes such as Global Scenario on Women and Water and Role of Women in Water resources Management, not a single foreign participant was visible at the inaugural function. The Chairman of CGWB, Dr. S.K. Chadha, later told The Hindu that international participants kept away because of Christmas.

The Minister of State for Water Resources, Ms. Bijoya Chakravarty, who is credited with conceiving the seminar, said the non- availability of adequate drinking water due to progressive depleting surface and ground water was a big challenge to the water management system of the country.

(The Hindu- 10/12/2000, Seminar)

(Water Management, New Delhi)

IE(3) Slow Pace Hits WB Anti-Arsenic Drive

Lack of public awareness on arsenic contamination of water and slow implementation of water and slow implementation of official programmes have seriously hampered the West Bengal government's drive to deal with the problem in the state.

"Long period of completion for large-scale government projects and lack of interim relief have added to the problem. Explaining the extent of arsenic poisoning in the state, the paper published by the All India Institute of Hygiene & Public Health (AIIH&PH), said " Lack of public awareness regarding the problem has further compounded it," Incidentally, the AIIH&PH is launching a decentralised community – based project in 400 villages with financial support from the Indo-Canadian Environment Facilities, to supplement government's efforts in this sector. The AIIH & PHm that said, " the need of the hour is to test all ground water sources in all blocks" admitted that it has so far been able to " test only 50,000 tubewells."

Testing of all ground water resources involves testing of about " 2.5 to 3 lakh private and public tubewells, " it said. Creating public awareness on the issue, which forms the thrust of the arsenic mitigation agenda of the institute, will be taken up under the three-phased Decentralised Participatory project, it said. The five-year project estimated to cost around Rs.9.588 crore would involve non-

government organisations and community level bodies in 400 affected villages of the state.

Under the project a rapid and realistic assessment at the village level. Training would be given to grass-root level workers in the use of the field-test kits.

(Indian Express, 09/12/2000, Santanu Banerjee)

(Water Quality, West Bengal)

H(3) Bihar seeks funds to fight flood menace

Bihar has sought a comprehensive financial package of Rs.55,000 crore from the Centre to meet expenses on large- term flood control measures like construction of high dams, improving irrigation and drainage system so as to boost agricultural production, official sources said.

The Government had asked for Rs.38,000crore to undertake measures like strengthening of old embankments, construction of new ones and high dams, besides Rs.16,300crores for completion of ongoing projects and creation of additional irrigation potential, the sources in State Water Resources Department said.

A sum of Rs.2, 200crores were proposed to be spent on Kosi high dam multi- purpose project for a permanent solution to recurrence of floods and Rs.1160crore for completion of drainage- related works, the sources said.

The proposal also envisages creation of additional irrigation potential for 53.53 lakh hectares of through, medium and major irrigation schemes, they said. The measure will foster a new era of green revolution in Bihar after the carving out of Jharkhand State, they added. The sources said that around 63.31 lakh hectares in Bihar were directly threatened by flood, while only 29.28 lakh hectares had been protected from the natural calamity. Currently major irrigation projects like Durgawati reservoir, West Kosi canal, Tilaiya diversion, Upper Kiul reservoir, modernisation of Sone and Jamania pump canal and Punpun barrage were being completed, they said. Work on three medium schemes, Orhani reservoir, Bilasi reservoir and Munhara had started in 1992.

In Jharkhand, sources said, seven major irrigation projects- North Koel dam, Ajay barrage, Punasi, Konar, Swaranarekha, Kadwan and Kanhar- are in progress.

The State Water Resources Development had proposed to send one-third of staff to Jharkhand and made available budgetary demand of Rs.218.83crore for five months to meet establishment expenditure, the source added-PTI.

(The Hindu- 6/12/20000)

(Flood Hydrology, Bihar)

H(4) DJB to augment water supply

As part of its strategy to increase the supply of potable water during summer months next year, the Delhi Jal Board (DJB) has started augmenting ground water resources along the flood plains of the Yamuna riverbed in North Delhi.

A large number of tubewells dotting the flood plains in the Alipur Block and Palla region of this part of the Capital have already been commissioned. According to DJB officials, before the onset of next summer, as many as 60

tubewells and five ranney wells would be commissioned thus giving an additional supply of 30 MGD to the water starved residents of the Capital. This is likely to come as a big relief, as the city has a shortfall of 200 MGD of potable water.

When the project is fully executed by the DJB on the advice of the Central Ground Water Authority and 100 tubewells and six ranney wells are dug, the Capital would get an additional 40 to 45 MGD of water, officials said, except for one ranney well of 2.5 MGD, the rest have the capacity of 4 MGD.

All set to complete their project before the deadline, as many as 40 tubewells and four ranney wells have already been dug so far and many of them have become operational. Work for sinking of the rest tubewells and ranney wells is in progress. Major work for these tubewells is being carried out by the Central Ground Water Authority on behalf of the DJB.

Officials said water from these tubewells and ranney wells is supplied to the Burari reservoir and then sent to parts of the Capital.

(The Hindu, 04/12/2000)
(Potable Water, New Delhi)

H(5) Rajasthan- Two Years of Government Devoted to Public Welfare

Drinking Water: For the permanent solution of drinking water, comprehensive water schemes costing Rs.2400crore have been sanctioned and works started on warfooting. Contingency Action plans for summer started. Under this plan 1573 new tube wells have been sunk in the problem-hit areas and 23000 new hand pumps have been installed. One lac 70 thousand hand pumps repaired under the special hand pumps repair campaign.

(The Hindu-1/12/2000)
(Potable Water, Rajasthan)

November

H(6) Bio- product for water treatment

Vijay Engg. has launched actizyme, a bio product, Imported from Australia for use in various water treatment areas such as septic tanks, greasetraps, drainage trenches, and drain lines from kitchen sink. According to the company, it is safe for children, pets and plants. The products, when applied, would reduce odours, turbidity, solids, grease and sludge levels and prevent blockages. Actizyme usage is usually through an initial shock dosage to clean and condition the system followed by maintenance dosing on a regular basis to enable the micro organisms to establish population that allows them to bloom frequently and replace natural losses in the system. The company cautions against use of disinfectants, caustic or other chemicals with actizyme as these stop vital biological activity. Enquiries: Vijay Engg. (bio-engg.), No.76, Tiny Sector, Industrial Estate, Ambattur, Chennai -58. Phone: 6242306, 6241264

(The Hindu- 23/11/2000)
(Industrial Effluents / Water Quality, General)

IE(4) Plea on Polluted Water Ignored

When villagers living along the GIDC-Vatva industrial belt switch on their tubewells, what flows out is not exactly the elixir of life. Out gushes a light red-coloured, polluted liquid that passes off as water in this area.

People from Chosar, Gamdi, Ropar, Mahji, Umiyapur, Bidaj, Bhuderpur and Laali villages have got used to living with polluted water. And what follows with it: skin infections, other disorders, and a land slowly losing fertility.

Chemical industries in the belt release deadly effluents into the Khari canal. The chemicals then make their way to the groundwater, polluting it. According to sources, pollutants have go down almost 500 m., but despite the problem having existed for the past 25 years, more than 50 borewells still keep giving coloured water.

Local people sent repeated reminders to the authorities, but no action has been taken, it is alleged. Certain government schemes offer compensation to affected villagers, but most haven't received it.

"Initially, when we started getting coloured water, we sent samples to the Water Department of the Ahmedabad Municipal Corporation (AMC), and they certified it 'fit for consumption'. This continued for about five years," says Suryakant Patel, sarpanch of Gamdi village. "Then our pumpsets started getting jammed and pipes started corroding, forcing us to dig beyond 500m," he adds.

The villagers contest the AMC officials version that it is the seepage of treated effluents, which is polluting groundwater. They allege that many textile and chemical units are pumping effluents directly into the ground at great depths.

No official was willing to comment on the issue. All of them –from the AMC to the state government and pollution control board officials- kept passing the buck. MLA Vijay Patel and MP Shankersingh Vaghela were not available for comment.

The villagers long ago stopped drinking this water, but still use it for other household purposes and irrigation. "We have developed skin diseases and numerous other disorders. Our cattle have died after drinking this contaminated water, says Hiraben of Chosar village.

Villagers are banking on a Gujarat High Court order asking the government to lay a pipeline that will take the effluents directly to the Piranha treatment plant, without polluting the canal. Work on the pipeline is under way, and officials say it would be ready by December 31.

Forests and Environment Minister Kanjibhai Patel admitted that there was a problem. "I sympathise with the villagers and know that there is a problem. But hopefully, once this pipeline is laid, the problem will be solved," he adds.

However, the villagers remain sceptical. The initial deadline of the pipeline was June, but it had to be extended because work was slow. "We have made numerous representations to the authorities, but nobody seems to listen," says a Gamdi villager.

(Indian Express, 20/11/2000, Denesh Vasvada)

(Water Quality/ Industrial Effluent, Gujarat, Kharl Canal & Pirana Treatment Plant)

IE(5) Arid Saurashtra was Once a Green Paradise: Experts

Imagine a Saurashtra that is green every where, where there are large water bodies and rivers, which has wide range of flora and fauna that can rival

any other part of the country and an average rainfall much higher than what it is today.

This is no dream. It is a picture of Saurashtra 5,000 years ago, say noted archaeologists who have been working in the region for over five decades.

The irony is that now Saurashtra is one of the worst drought-affected regions of the country. The topography has changed to a barren, arid land, with hardly any noticeable green cover, rivers in the region are dry even during the monsoon, sweet water bodies have almost disappeared and the average rainfall has decreased considerably.

The reason for this is improper water management and climatic changes, say archaeologists Suba Rao, S.R. Rao, P. P. Pandya and Y.M. Chitalwala.

Suba Rao from M.S. University, Vadodara, worked in the region from 1950 to1962, S.R. Rao, who was with ASI, worked here from 1965 to 1975 and P. P. Pandya, who was with the State Archaeological Department, worked in the region before 1965. This picture of Saurashtra is based on their combined research and extensive excavations in the region.

They have excavated around 250 different sites in Saurashtra in the last 50 years, including the sites of the Indus Valley civilisation. Head of Rajkot Circle of State Archaeology Department Y.M. Chitalwala said though Saurashtra was not as green as Assam, it had a thick forest cover some 3500 years to 5000 years ago and the average rainfall was much more than that at present.

Excavations reveal that the present Gir jungle extended up to Barda Dungar, which is in Porbandar district, and there, were stretches of green cover throughout the region. Bones of animals like rhinos were found during excavation in Bhavanagar district and it has been recorded that rhinos existed in the area till 500 years ago. Many other wild species found in different jungles of India were also present in the region.

The report said about 20 Harappan sites like Lothal, Khanpur near Morbi, and Kuntasi excavated in the region, revealed that water was aplenty and cultivation flourished in a planned way. The cropping pattern was based on the Rabi and Kharif system and the main crop was bajra.

The excavations also revealed that almost all-ancient sites were located on large bodies of sweet water such as lakes, either natural or built by the Harappans. These do not exist now.

Excavation of sites of the third to second century BC – the time of the Maurya rule almost all over north India – revealed that irrigation networks and water harvesting were the order of the day. Big lakes like Sudarshan were built during that time and small hamlets survived through water management.

The tables turned for water management in the region during the medieval period. Chitalwala said, in the medieval period, Saurashtra was ruled by many small kings. Water management and harvesting were totally and this continued. Forests were cleared due to increase in population and this caused the climatic changes, he added.

(Indian Express, 20/11/2000, Parag Dave)
(Drought Hydrology, Gujarat (Ancient Saurashtra))

H(7) SC asks center, T.N., Kerala to reply to dam panel report

The Supreme Court asked the Centre and the States of Tamil Nadu and Kerala to file their replies to the report of the expert committee set up to study the

safety aspect of the Mullai Periyar dam and the raising of the water level in the Mullai Periyar reservoir.

Explaining the need for raising the height of the dam, the janta party president, Dr. Subramanian Swamy said the farmers in Tamil Nadu were agitating for raising the dam's height as around four lakh hectares of agricultural lands were deprived of irrigation water.

He drew the attention of the court to the committee's categorical statement that the apprehensions regarding the safety of the dam after repairs. Strengthening was neither justifiable nor well founded. He said the Committee had also found that the apprehension about the possibility of excess seepage in the dam if the water level was allowed to be raised above 136ft was not justifiable. Dr. Swamy said the committee was of the opinion that if the water level in the dam, including the baby dam in the Mullai Periyar reservoir was raised from 136 to 152ft, the strengthening measures proposed in the baby dam as well as the adjacent earthen bund were necessary and should be allowed to be executed without any loss of time.

But, today's newspapers had reported that the Kerala Government had refused to allow the engineers from Tamil Nadu to do the repair work. He pleaded with the court to issue a direction to allow the engineers to carry out their work. When he indicated the willingness to file an application in this regard, the CJI said, "we can't be issuing directions on the basis of newspaper reports." Asking the centre to file copies of the committee's report to the court within 10 days, the Bench said replies by the parties concerned had to be filled in 10 days thereafter.

(The Hindu- 18/11/2000)
(Dam Hydrology, Tamil Nadu & Kerala)

H(8) **Govt. to study surplus Krishna water issue :CM**

The allocation of surplus Krishna waters was a sensitive issue which needs careful examination in the wake of the expiry of the Bachawat Tribunal award on riparian rights on May 31 this year, the Chief Minister, Mr. Chandrababu Naidu said. Speaking to the newsmen at Cuddapah aerodrome here on Friday when he made a brief transit halt on way to Kuppam, Mr. Naidu said he could not make any comment offhand on the Karnataka. Chief Minister, Mr. S.M. Krishna's statement that he had discussed the Krishna surplus waters issues with the Maharashtra Chief Minister, and was ready to hold discussions with Mr. Chandrababu Naidu. He said it was a sensitive issue and elaborate discussions were necessary before seeking fresh water allocations.

The 11th Finance Commission recommendations had led to pruning of the State outlay by nearly Rs.730 crores and this had led to a resource crunch, the Chief Minister said. The Government had proposed to prioritise the development works after introducing the zero- based budget and had curbed unproductive expenditure, he said.

The Chief Minister said that a vigilance enquiry was in progress into the Cuddapah MLA, Dr. S.A. Khaleel Basha's charges that some individuals of Cuddapah town had given shelter to members of the terrorist organisation, Deendar Anjuman. Appropriate action would be initiated on completion of the vigilance enquiry into the issue.

Asked about the tardy progress of irrigation projects in the Rayalaseema region, the Chief Minister said the Government would expedite the works by

pooling up the necessary resources. Various alternatives and divergent views were being examined on the Galeru Nagari project. When pointed out about apprehensions that the Government was planning to confine Galeru Nagari project to Kurnool and Cuddapah districts by limiting it upto Kamalapuran and catering to the irrigation needs of Chittoor district from Somasila reservoir on gravity flow basis, Mr. Naidu said there were proposals but a detailed survey was not yet ordered. On the Veligallu medium irrigation project, which received the Central Water Commission's clearance, he said it would be posed to the AIDF or NABARD for assistance.

(The Hindu- 18/11/2000)

(Water Management, Andhra Pradesh, Krishna river & Nagari Project)

H(9) Guidelines for future dams

A "rights- and –risks approach" should determine whether large dams are built rather than the usual cost- benefit calculations. This is the central suggestion of the World Commission on Dams (WCD), which released its report in London today. In its 398- page report titled "Dams and Development- A new framework for Decision- making", the WCD sets out values, criteria and guidelines that could govern future decisions on dam building. The report was released by the former South African President, Mr. Nelson Mandela.

The WCD was born in May 1998 against the background of increasing controversy surrounding big dams world-wide. It was conceptualised at a meeting in April 1977 initiated jointly by the World Bank, one of the principal founders of large dams in developing countries, and the World Conversation Union (IUCN) to which the opposing sides of the dams debate were invited. All agreed that an independent review of large dams was needed so that a set of guidelines could be formulated for future big dams.

Since then, the 12- member WCD, which is headed by South African Education Minister, Prof. Kader Asmal, with India's Mr. Lakshmi Chand Jain as the vice- chair, has conducted wide- ranging consultations with all the stake holders in this issue. It has held four regional consultations in which 1,400 individuals from 59 countries made representations took part in two hearings on large dams organised by NGOs in Southern Africa and Europe and received 947 submissions from over 80 countries.

Apart from this, the WCD commissioned eight independent case studies on large dams and two country studies (India and China). It also sought 17 thematic reviews under the following categories: social, environmental, economic and financial, options assessment and institutional. And finally, it conducted a comprehensive global survey of 125 dams for a "Cross- Check Survey". Altogether, 1,000 of the 45,000 large dams in the world have been examined in some detail. All this data is now a part of the WCD Knowledge Base, which will freely available.

It is the consequence of this detailed and consultative process that has led to the final report. Despite the diversity of views represented by the commissioners, who include dam builders and those who oppose them, members of government and NGOs, academics and consensual. The only commissioner to have made a separate representation is Ms. Medha Patkar of the Narmada Bachao Andolan who has felt that some fundamental issues are missing or have not been given the central place they deserve. These include the fact, as she sees it, that "dams are a sympton of the larger failure of the unjust

and destructive dominant development model". But Ms. Patkar has signed the report and suggested that the missing elements form an agenda for future dialogue and research.

Anti- dam NGO's hail report

Other anti- dam NGOs, who also took part in the WCD consultations, have generally welcomed the report. "The WCD report vindicates much of what dam critics have long argued. If the builders and founders of dams follow the recommendations of the WCD, the era of destructive dams should come to an end, says Mr. Patrick McCully of the International Rivers Network.

The WCD report, however, is not narrowly critical of large dams. It assesses the positive and negative points of large dams and then sets out criteria and guidelines for the future. It has used three important internationally-endorsed conventions to arrive at five core values. These are the little- known UN Declaration of the Rights to Development (1986), the UN Human Rights Charter (1948) and the Rio Declaration on Environment and Development (1992).

(The Hindu-17/11/2000, Kalpna Sharma/ NGOs)
(Dam Hydrology, General)

IE(6) When The Water Table Falls

Punjab and Haryana have been facing the problem of a falling water table for more than twenty years. It is posing a serious threat not only to the green Revolution but also to the ecology of the region; brackish water from the adjoining areas may begin intruding in the sweet water zone. If this happens, it will be an irreversible ecological disaster , it may already have begun. These states must immediately find a remedy for controlling their water tables. Both the states area in a position to do so by injecting into the ground all the run off from the rainfall which is being allowed to go waste into rivers via a netwrok of drains. The only trouble with this water is that it will require to be de-silted. These states have neither the know-how for the same nor any inclination for acquiring to. Realising the gravity of the situation, the Punjab Agricultural University (PAU) took a decision of exploring methods for desilting of rain water. Encouraged by the results, it has now set up a full-fledged injecting station on the Raipur link drain near Ludhiana and is all set to achieve a breakthrough.

(Indian Express, 16/11/2000, S.P. Mahrotra)
(Ground Water Hydrology, Punjab & Haryana)

H(10) Capturing Yamuna's distress on camera

If apathy and insensitivity of the generations gone by have been chiefly responsible for the high levels of pollution in the Yamuna, it is the teenagers who are now showing the way to save this dying river.

Unmindful of the fact that their effort, at most, could be described as a drop in the ocean, youngsters, under the banner of "We for Yamuna", have not only initiated an awareness campaign but also started cleaning up the river banks.

After a serious of nukkad nataks across the Capital for the past few months, one of the volunteers has now made an effort to bring before the people, the scene of dying river through a photo exhibition.

"It is time people know what they have done to this historical river due to their irresponsible behaviour," says fourteen- year- old Sahir Raza. His exhibition, "Save the Yamuna" started at the Constitution Club here today.

"Our aim is not only to generate awareness among the masses but also to involve them in our effort in cleaning the river," he observed soon after the exhibition, organized by " We For Yamuna" and sponsored by "Wahindia.com", was opened to the public.

Through the 60- odd photographs and some statements, facts and media reportage, Sahir has drawn the sketch of the river to which Delhi-ites contribute as much as 80per cent is domestic sewer waste.

Having never taken a dip in the Yamuna- for obvious reasons- Sahir is at pains to explain how the crystal clear water of the river in the catchment area turns almost black after it leaves due to the severe pollution level. "All this because, we Delhi-ites contribute 3,538 litters of waste to the river every day," he says.

A student of Springdales School, Dhaula Kuan, Sahir has been concerned about environmental degradation in the city for the past few years and has captured the river's distress in camera.

Through his "Save Delhi" photo exhibition, displayed at the Millennium International Children Conference, Britain, in May and at the Press Club of India here in June, he has expressed his deep anguish over the environmental degradation of the Capital.

"We will make this a movement," he asserts. In fact while the exhibition was being inaugurated, other members of the "We for Yamuna" presented a nukkad natak outside the venue. "Our motive is to sensitise people towards the problems and mobilise public opinion to bring about a positive change," Sahir says.

(The Hindu- 11/11/2000, Lalit K.Jha)
(Water pollution, New Delhi, Yamuna)

H(11) People flee drought- Hit Chhattisgarh areas

The current spell of unprecedented drought in more than half of 16 districts of the newly formed Chhattisgarh State has forced thousands of people to leave their villages in search of bread and butter.

Officials said yesterday that about 50,000 people from drought- hit areas have migrated to other places in search of livelihood. Due to lack of rain there is acute scarcity of drinking water besides water for irrigation in 8 of the total 16 districts of the state, officials added. The affected areas are Bilaspur district's Bilha and Mungeli Tehsil, Mahasamund's Saraipali and Basna Tehsil, Dhamtari's Dhamtari, Kurud and Nagri, Raipur's Raipur, Tilda, Balauda Bazar, Palari Bhilaigarh, Kasdol, Simga, Arang, Gariaband and Bhatapara Tehsils. Durg's Dhamdha, Bemetra, Berla,Suza, Navagarh, Baloud Tehsils, Kabardha district's Kabardha and Pandaria, Raigarh's Raigarh and Kharsia Tehsils and Moria district's Baikunthpur are the other affected tehsils.

During his first visit to Delhi after becoming Chief Minister, Mr. Jogi appraised the Prime Minister, Mr. Atal Behari Vajpayee, of the drought situation in the State and asked for central team to evaluate the situation and central assistance.

The state Chief Secretary, Mr. Arun Kumar, said that a seven member central team led by joint secretary agriculture, Mr. P.D. Sudhakar, is coming here

tomorrow on a three- day visit to evaluate the drought situation.

The central team will visit several drought affected areas in the State for the first two days and would hold discussions. Arun Kumar said various employment generation schemes were already in effect and some more schemes are under consideration.

The State is considering getting fodder from places outside the State as the drought has a bearing upon the livestock also, he said. Officials said the earlier governments had not drawn up any plans to tap the water resources in the State, which could be the reason why no alternative is available to the farmers, once the monsoons fails

(The Hindu- 10/11/2000)
(Drought Hydrology, Chhattisgarh)

October

H(12) Concern at poor storage in Nagarjunasagar

With all 26 crest-gates installed, the Almatti dam build up a 515-m storage for the first time this year, quantified at 68 tmcft, while distressingly poor levels are reported by its cousins in Andhra Pradesh – Nagarjunasagar dam and Srisailam dam – also for the first time in the recent years.

Officials watching the inflows in the Krishna rule out Almatti being responsible for the lack of water in the two dams as has been feared. Quoting monsoon figures, they attributed the poor inflows to deficit rain in the river's catchment area, which lies in Maharashtra. There was excess rain in parts of the Krishna basin in Andhra Pradesh Government, Karnataka refrained from increasing the storage beyond the 515 –m level as otherwise it would have filled the reservoir, whose capacity has gone upto 123 tmcft with the installed gates adding 10.6 m to 509 –m high structure.

Andhra Pradesh officials said the utilisation of Almatti waters might now be around 40 tmcft. Karnataka originally planned for Almatti a height of 524m, which would have enabled the dam to store 227 tmcft.

Srisailam and Nagarjunasagar lifelines of Andhra Pradesh and which provide hydro-electricity from their combined installed capacity of 1,730 MW and irrigate 35 lakh acres, are in the lurch. Owing to poor inflow, Srisalam was filled up late (full by October 2); this will remain so far the present year unless there is rain in Maharasthtra, which is a remote possibility.

Nagarjunasagar, to which tourists would have thronged this time of the year to enjoy the artificial waterfall formed when the flood-gates were opened, is pale today. The storage is only 560 ft MSL even after three-fourths of its filling season is over, its full reservoir level is 590 ft.

The poor inflows have had cascading effects. It is estimated that Nagarjunasagar lost 60 tmcft; its maximum capacity is 408 tmcft. The shortage has had a telling effect on its irrigation and power generation activities.

A chart on inflow into the Krishna for the past 10 years shows that 1992-93, 1995-96, 1996-97 and 1999-2000 were bad years. The year 1994-95 was good with the inflow going up to 2,040 tmcft and was followed by 1998-99 (when Srisailam hydel station was submerged on October 15), 1991-92 and 1990-91 with 1,703 tmcft, 1,627 tmcft and 1,552 tmcft respectively.

(The Hindu , 30/10/2000, Malleswara Rao)
(Dam Hydrology, Andhra Pradesh, Nagarjunasagar Dam & Almatti dam)

H(13) Re-construction to begin on Oct.31.

The Government has decided to put all its might behind the commencement of the re-construction of the controversial Sardar Sarover project in Gujarat following the Supreme court clearance to raise the height of the dam by two meters at one go.

The Home Minister, Mr. L.K.Advani, who is a Member of Parliament from Gandhinagar in Gujarat, and the Union Minister for Water Resources, Mr. Arun Charan Sethi, will be present at the dam site to oversee the work on October 31. There are provisions in the tribunal award linking submergence, displacement, rehabilitation and resettlement. Irrigable land , for instance, must be made available one year in advance of submergence. The award has said that in no event, shall any areas in Madhya Pradesh and Maharashtra be submerged under the project unless all payment of compensation, expenses and costs are made for acquisition of land and property and arrangements are made for the rehabilitation of the oustees and they are intimated about it.

The Gujarat Chief Minister , Mr. Keshubhai Patel, told press persons today that the Sardar Sarover dam would be constructed within the next two years with an additional expenditure of another Rs.10,000 crores.

(The Hindu, 28/10/2000)

(Dam Hydrology, Gujarat, Narmada Dam)

IE(7) Reservoirs of Sorrow – The Karma of Dams

In his article titled 'Reservoirs for the future: The dharma of dams' (IE, October 23), C V J Varma eloquently describes the growing need for water and power in India and concludes that it is the duty (or dharma) of dams to meet these growing needs. Though I have no quarrel with his facts, I would like to question his conclusions on the basis of the actual performance (karma) of large dams in India.

In a recent report written by some of us for the World Commission on Dams (WCD), 'Large Dams : India's Experience', an exhaustive look at the facts and figures available establishes that until 1978, most dams were not assessed for their environmental and social impacts. Even when they began to be assessed, alternatives to the dam were never assessed and mostly not even considered. Also, that the current system of granting environmental clearances is subject to all sorts of political and administrative pressures, resulting in clearances being granted to projects without assessing their impacts or even when they are non-viable.

In the WCD report an attempt is made to gather together all available information and, by extrapolation, get some understanding of the magnitude of the impacts. Accordingly, the amount of forests submerged by large dams, between 1980 and 2000, works out to be between 9.1 million hectares (our calculation) and 4.5 million hectares (based on the Central Water Commission data). And this, when we are already well below the stipulated 33 per cent forest cover.

Similarly, the data provided by the Central Power and Irrigation Board of the Government of India for 19 dams shows that in all but one of these dams (Machkund), the rate of siltation of the reservoir is higher than anticipated. This has serious recreations on the life, the safety and the economic viability of the dam. The excess rate of siltation ranges from 115 percent in Kangsabati to 809 percent in Maithon, with 10 of the 19 having an actual rate that is over 200

percent of the anticipated rate. In an alternate data set, of the CWC, for 13 of these projects, the variation is between 649 percent (Beas unit II) to 88 percent (Panchet). Eight of these 13 show observed rates of over 200 percent.
(Indian Express, 25 /10/ 2000, Shekhar Singh)
(Dam Hydrology, General)

IE(8) A Cauvery Settlement For Narmada

This one is with apologies to George Bernard Shaw, since many intelligent women are involved in the Sardar Sarovar controversy, but a guide is definitely required. They say the water will never reach the fields. This is the first project in India, in which a large part of the canal system has already been constructed, even before the dam is ready. We now proceed to 90 meters. When we reach 110 meters, the water will be diverted into the Narmada main canal, which is one of the more impressive and beautiful civil structures in India. Its capacity is like the Yamuna in high flood and can carry 44,000 cusecs of water. At kilometre 231 you can see it near Ahmedabad and many villages see the distributors and pray for the day the tap will be turned on. The story that the water will never flow can only be spread abroad among the believers.

They say rehabilitation will never be done. But more than 25,000 persons have already been relocated. Every year an independent research agency monitors their conditions. If they have a grievance they can go to a special arrangement the Supreme Court has set up under a very senior judicial person for redressal. Very little additional relocation is required to go to 110 meters. They say that now that the court has made satisfactory relocation a precondition of progress on construction, nothing will be possible. But the so-called parri passu clause was there in the project approval by the Planning Commission.

They say the water won't reach Saurashtra and Rajasthan. Also, the project is very expensive. It is expensive because it uses modern conveyance and management strategies. But in large experimental areas it has been shown that with these technologies, water delivery is highly efficient and wastage is low. So water will reach the borders of Gujarat. The days of sloganeering are numbered as reality begins to work on the ground.
(Indian Express, 24/10/2000, Yogesh K. Alagh)
(Water Availability, Gujarat, Narmada)

IE(9) Reservoirs For The Future: The Dharma of Dams

It is gratifying to read the Supreme Court's verdict permitting further construction of the Sardar Sarovar Dam project. It is a landmark judgement for India's water resource development because it recognizes some cardinal truths. To quote from the judgement ""... construction of big dams cannot be equated with setting up of polluting industries as far as their effect on the environment is concerned. What is being constructed is a large dam. It is neither a nuclear establishment nor a polluting industry. The construction of a dam would undoubtedly result in the change of environment but it will not be correct to presume that it will result in ecological disasters".

Nature is a huge desalination plant that transforms seawater – which comprises nearly 97 percent of the total available water on earth – into the precious substance upon which human life depends. Unfortunately, nature does

not make water available in the places where we want it to be, when we want it and in the quantities we require it to be.

It is this that necessitates technological intervention for purpose of harnessing, conserving and properly managing water resources. And it is this which underlines the absolute necessity for dams – although they will, of course, have to be carefully planned. Some 45,000 dams exist in the world today and about 30,000 are required by the end of the century.

The human use of water has increased more than 35-fold over the past three centuries, totalling an annual consumption of 3,400 cubic kilometres. Out of this, 69 per cent is used for agriculture, 23 per cent for industry and eight per cent for domestic use. However, developing countries, especially those in Asia, use 86 per cent of its water for agricultural purposes.

Together with this, there is another dynamic at work: Population growth. The world's population is expected to increase to 8.9 billion by 2050, and again 59 per cent of the people will be in Asia. While every effort must be made to check this phenomenon, there is no denying that growing numbers will put a great pressure on food stocks. Foodgrain demand, globally, is estimated to increase by 37 per cent, from 1,937 million tonnes at present to 2,655 million tonnes by 2050. This makes it imperative that we manage our water resources wisely.

In most countries, especially in developing ones like ours, rivers carry the bulk of their water during the four monsoon months, followed by the relatively dry non-monsoon months. Dams, small or big, have to store water for regulated release in the lean months, as well as to moderate floods and facilitate hydropower generation.

So how far has India gone in meeting some of these challenges? Certainly, an immense effort has been made over the past 50 years in the field of water resources development. The irrigated land area in the country has increased from 23 to 92 million hectares and consequently agricultural production has multiplied some four-fold, from 51 million tonnes to 198 million tonnes. By 2050, Foodgrain production will have to increase to 500 million tonnes and for this to happen the irrigated area will have to increase by 160 million hectares – 75 per cent more than what India has today.

India, before 1947, had only 300 dams as against some 4,300 today. Given its requirements, it would need another 10,000 over the next 50 years. There is, of course, the argument that proper watershed management can serve as an alternative to storage reservoirs. While traditional methods like water harvesting, and so on, are necessary and must be encouraged, they are just not sufficient to ensure the country's sustainable food security and drinking water requirements. Besides, they do not address its energy demands. In short, there is just no alternative to dams, big and small, if the country's future has to be secured.

(Indian Express, 23/ 10 /2000, C.V.J. Verma)
(Dam Hydrology, General)

IE(10) SSP To Benefit Drought-Hit Areas : Experts

First the bad news: the Sardar Sarovar Project (SSP) would irrigate only part of the Saurashtra, Kutch and North Gujarat regions. But the good news is better: the project promises to reach drinking water to all the drought-prone

villages in all the three regions through a pipeline network based on the SSP's main canal.

The first glance at the command area of the SSP presents a depressing picture, for it leaves out a majoring of the areas in Saurashtra, while Kutch is just at the tail-end of the beneficiary districts.

But, according to Narmada Development Minister Jaynarayan Vyas, this is only the irrigation aspect of the project while all areas affected by drinking water scarcity in the three regions will have no problem once the Narmada waters start flowing. He expects the project to be ready by 2004.

"This is a canard. It is wrong to say that the SSP will not reach drinking water to most parts of the drought-prone areas in the state", asserts C.C. Patel, a former chairman of the Sardar Sarovar Narmada Nigam and Water Resources Adviser to the government. Patel claims the project is going to "cover each and every drought-affected village in the three regions".

There is a pipeline network worth Rs.8,000 crore to be based on the SSP's main canal to supply drinking water. Only 790 of the total 8,215 villages to be given drinking water from the SSP are in Ahmedabad and the Panchmahals districts. The rest are in Saurashtra, Kutch and North Gujarat. Similarly, 120 towns from the total 135 to be supplied drinking water are in the three regions. Twelve are in Ahmedabad and three in the Panchmahals.

Significantly, points out the Narmada Development Minister : "The cumulative benefits of the project are not reflected in the dam's command area". He says at present 40 percent water from whatever little is received by all major dams in Saurashtra – has to be reserved for drinking water. Once that problem is taken care of, more water will be available from these dams for irrigation.

"This way, actually irrigation spread will improve, while the SSP is already going to irrigate nearly 18 lakh hectares of land", the Minister says.

Similarly, Vyas explains that with surface water being made available to farmers in all the three regions, their dependence on groundwater would come down.

This would not only reduce the excessive groundwater extraction – which is pushing water stables down at present at an alarming rate of 10 feet every year – and help recharge the groundwater but would also increase the moisture content in the land.

(Indian Express, 22 /10/ 2000)
(Water Availability, Gujarat , Sardar Sarover Project)

H(14). Decision to reserve dam waters angers farmers

The drought situation this year in the Kutch-Saurashtra and the north Gujarat regions is feared to be even more serious than the last year. Which the Chief Minister than had described as the " worst in the century". With the rainfall this year being less than 50 % of the average receipt in a year, the stock of water in the 113 small and medium dams in the Kutch-Saurashtra region has been estimated at just about 260 million cubic metre against the total capacity of over 2,270 MCM. This was against the last year's stock of about 13 to 15 % in these dams. The situation in the north and the central Gujarat regions will be no better.

Security has been tightened around the dams to prevent farmers from lifting water for irrigation and the police had been instructed to impound the pumps used for the purpose. The situation is volatile in the entire Kutch-

Saurashtra and the north Gujarat regions where the village women even in October are forced to trek for miles to collect a few pitchers of water for drinking purposes.

Even the Urban centres, including Ahmedabad city, has already started filling the pitch of water shortage. In Ahmedabad municiple corporation areas, the evening supply of water has been discontinued. Rajkot, the nerve centre of the Saurashtra region, gets water supply on alternate days. All sources of water for Jamnagar city has started drying up and the Chief Minister recently had to rush to Mumbai to request the Reliance Industries Limited to come to its rescue with supply of water from its desalinisation plant at the oil refinery near Jamnagar. The supply of water to Surendranagar, Wadhwan, Junagadh, Morbi and most other towns in the Saurastra region has been reduced to once in two to three days.

(The Hindu, 22/10/2000, Manas Das Gupta)
(Water Availability, Gujarat)

H(15). SC clears construction of Narmada dam up to 138 metres.

In a significant decision, the Supreme Court today gave the nod for the construction of the controversial Sardar Sarover dam on the Narmada river immediately upto a height of 90 metres in stages on getting proper sanction from the authorities concerned. The order to be implemented as per the tribunal's award according to which the height could reach 138 metres, is expected to benefit Maharashtra, Madhya Pradesh and Gujarat.

As per the award, Madhya Pradesh will receive 18.25 million acre feet (MAFT) of the river waters. Gujarat 9 MAFT and Maharashtra 0.25 MAFT.

The Rs.18,000 crore-project had to be stopped for four years from 1995 as the petitioners had challenged it on various grounds. The majority judgement made it clear that construction of the dam, at present at a level of 88 metres, could be carried to a height of 90 metres immediately as the relief and rehabilitation of the affected people had been undertaken satisfactorily by the three State governments.

The court said construction of the dam in stages beyond 90 metres would depend on the clearances given by environmental and rehabilitation authorities. It said, " the environmental subgroup in the Ministry of Environment and Forest will consider all aspects before giving clearance for the construction at each stage beyond 90 metres."

The foundation stone for the dam was laid in April 1961 but the project could begin only in 1967. The project envisages construction of several major, medium and small dams across the Narmada and its 41 tributaries.

In 1994, the apex court allowed raising of the height upto 85 metres and early this year through an interim order, it allowed construction upto 90 metres.

(The Hindu, 19/10/2000)
(Dam Hydrology, Gujarat, Narmada Dam)

IE(11) Sea Water Invades, Fertile Farmlands In Andhra Turn Saline

The farm-rich south coastal Andhra districts are reportedly sitting on the brink of a major ecological disaster that can upset the food-grain production and cause severe drinking water crisis in the next decade.

Unplanned and heavy drawl of underground water, encroachment of irrigation tanks, steep fall in river inflows, large-scale aquaculture and indiscriminate use of chemical fertilisers have all contributed to the dreaded environmental problem of sea water-fresh water interface. The problem is so alarming in certain pockets of these districts that sea water has intruded landwards through the underground geological channels up to 35 kms.

The problem is all the more severe in Krishna district where the sea water intrusion gained momentum in recent years. In 1976, when the first studies on the groundwater were conducted, the sea water intrusion was limited to the immediate coast and upto a few kms landwards.

But recent studies show that the salt water-fresh water interface has reached villages, some 35 to 40 kms away from the sea coast. It simply means no drinking water for the lakhs of people living in these villages and also no water for irrigation. This purely man-made phenomenon has led to salinity of soils wherever the interface is more.

The districts of east Godavari, west Godavari, Krishna, Guntur, Prakasam and Nellore, with vast stretches of fertile agricultural lands, together make u what could be called the granary of south India. Any setback in agricultural production in this belt will upset the grain markets in Andhra Pradesh and outside. The sea water-fresh water interface has led to two severe ecological imbalances on land and in water. While thousands of hectares of fertile lands are turning saline, several fresh water bodies have lost their natural character.

According to official records, due to salinity the blackgram (grown on rice fallow) production in Krishna district has gone down to 700 kgs/ha by 1997-98 as against the average productivity of 1100 kgs/ha.

(Indian Express, 15 /10/ 2000)
(Sea Water Intrusion, Andhra Pradesh)

H(16). Plastic Pipes to Fight Water Contamination

In a move with far-reaching repercussions, the Delhi Jal Board has decided to make the use of plastic pipes mandatory instead of the chrome-iron ones – used so far – for connecting household connections with the main DJB line.

The decision, taken early this week, is likely to solve the major problem of contamination and help in supply of clean potable water to consumers.

According to DJB Chief engineer, iron pipes resulted in corrosion over a period of time, leading to disruption in flow of water and leakage, thereby increasing the risk of contamination. This is not the case with the specially prepared medium density polythene (MDP) pipes, which would replace the iron ones. Cities like Hyderabad and Banglore have already been using MDP pipes on a large scale for quite some time now. About 20-25 % of service pipes needs immediate replacement as they have been badly damaged. It would be compulsory for all knew 40,000 to 50,000 connections.

(The Hindu, 13/10/2000, Lalit Jha)
(Water Quality, General)

H(17). Panel on Parlyar Dam to submit Report on October.

The high-level Expert Committee, constituted by the Union Government on instructions from the Supreme Court, to go into the controversy over the

increase in the water level in Pariyar Dam, is expected to submit its final report on Oct/19.

The seven member committee, headed by Mr. Mittal, Member, Central Water Commission (CWC), which completed its inspection on the dam site, would hold its final sitting at New Delhi before submitting the report.

The team inspected the entire structure of the reservoir and its various components, which included the Baby Dam, the drainage channels, the seepage pressure etc. The Committee members also inspected the recently constructed spill-ways and old regulators and the energy dissipation works completed by the Tamil Nadu Government. The safety of the Baby dam was also highlighted.

(The Hindu, 13/10/2000)

(Dam Hydrology, Kerala, Periyar Dam)

H(18). Central Project to Improve Environment in Five Cities

For upgrading the quality of life and restoration of the environment, the Union Ministry of Urban Development has drawn up integrated plans for five culturally important cities in the country. The five cities are Varanasi in U.P., Puri in Orissa, Dwarka in Gujarat, and Tiruchi and Madurai in Tamil Nadu, said Union Minister for Urban Development.

The cost of the integrated project for Tiruchi was estimated at about Rs.110 crores and the work would commence in three months. It would be completed in about three years.

Mr. Jagmohan, who accompanied by the Union Minister for Environment, Mr. T.R.Balu, studied the pollution caused by the sewerage and drainage to the Coleroon and Cauvery rivers, said rapid urbanisation of cities in gross violation of rules laid out for town planning had resulted in steep deterioration in the quality of life. To set right this trend, the Ministry had taken up integrated development plans for five cities in the first phase, at least one culturally important city would be taken up in each state.

(The Hindu, 13/10/2000)

(Environmental Hydrology, Tamil Nadu)

H(19). Experts for Inclusion of Water in Concurrent List

Hydraulic Engineers and river water management experts have opined that water should be included in the concurrent List of the Constitution so that the centre enjoys an edge over states in the matter of equitable distribution of the natural resource among various states.

Experts attending the 3-day Hydro-2000 conference at the Regional Engineering College Campus, (Kurushetra) said that maximum utilization of river water could be made by incorporating water in the Concurrent list, instead of the State list, as enshrined in the Constitution. All disputes among states would come to an end and give way to developmental activities if this was done, they opined.

Prof. S.K.Majumdar, who taught hydraulics for 25 years in Delhi College of Engg., said that the Centre and State governments should take note of the recommendations of the national research bodies like Indian Society for Hydraulics if they wanted to derive maximum use of their research works. He said research on water should be entrusted to engineering colleges or Universities having basic infrastructure for this.

They were also discussing research papers on coastal hydrodynamics, tidal level forecasting , break water design and design of cyclone resistant engineered and non-engineered structures.
(The Hindu, 11/10/2000, Conference – Hydro 2000 in Punjab)
(Water Policy, General)

H(20) Bengal to Seek Rs.1,487 cr.

The West Bengal Government would demand Rs.1,487 crores from the Central Calamity Relief Fund to cope with the devastation caused by floods in the State that has claimed many lives.

Earlier the latest flood situation was reviewed at a high-level meeting at the secretariat convened by the Deputy Chief Minister, Mr. Buddhadev Bhattacharjee, Mr. Dasgupta said. Although there has been overall improvement in the situation, the condition in North 24-Parganas and parts of Nadia district was still critical. While the water level in Gaighata, Bagdah, and Swarupnagar was receding the situation in Deganga continued to deteriorate.

The number of people affected in the floods rose to 2/1 crores covering a total of 171 blocks and 69 municipalities in the State so far, Mr. Dasgupta said. The Chief Minister, Mr. Jyoti Basu, has already urged the Prime Minister to treat the flood as a " National Calamity". The Deputy Chief Minister, Mr. Buddhadev Bhattacharjee, said rescue and relief operations were continuing in full swing while the State Government was giving priority to Public health in order to prevent outbreak of epidemic in the affected areas.
(The Hindu, 9/10/2000)
(Flash Flood, West Bengal)

H(21). State Concerned over Cracks In Koyna Dam

The Karnataka Government, based on credible information, is perturbed over the serious cracks in the Koyna dam across the Krishna in Satara district of Maharashtra and has decided to move the Union Government to immediately ensure that action was taken to prevent a national calamity.

Reports have it that the Koyna region, which was the epicentre of an earthquake on Dec.1967 (leading to a dam burst and a consequent loss to life and property), has been facing repeated tremors. A recent tremor is stated to have caused cracks in the dam beyond the prescribed limits, and about a fortnight ago, there was a sudden discharge of a large quantum of water downstream of the Krishna.

The Koyna dam has a water hold of around 100 tmcft. One of the large dams in the country, the water stored in it is largely used for power generation apart from irrigation. The State Government conveyed its anxiety to the Central Water Commission. Downstream of the Koyna were major irrigation projects such as the Almatti (storage of around 120 tmcft,), the Narayanpur dam (30 tmcft), the Nagarjunasagar (around 250 tmcft.) and the Srisailam project (around 300 tmcft.). All these dams would be in danger if the Koyna dam burst.
(The Hindu, 8/10/2000, S. Rajendran)
(Dam Hydrology, Karnataka, Koyna Dam)

September,2000

H(22) Pani Panchayat Scheme Launched in Orissa

The Orissa Government today launched a participatory irrigation management scheme under which farmers will form societies, called "Pani Panchayat", to take over the maintenance of canals and minor Irrigation systems.

Launching the scheme, the Chief Minister, Mr. Naveen Patnaik, said; "The Government is burdened with a large salary bill and a huge debt burden and unless we start associating the users in a meaning full way we cannot sustain the system in the long run". He said despite huge amount of money being spent on irrigation projects, the government had not succeeded in bringing the farmer and water together in a meaningful way. Though the Department of Water Resources had more than 50,000 employees, the farmers were not happy with the irrigation system.

Expressing satisfaction at the success of four pilot projects, Mr. Patnaik said the farmers had been able to make more efficient use of water. The sharing of water had been more equitable and there had been greater diversification in cropping pattern.

Under the scheme, farmers would be organised into registered societies and each Panchayat will look after the maintenance of a minor or sub-minor irrigation system covering 500 hectares. The Government will provide an annual maintenance amount of Rs.35 per hectare. He said his Government would extend the scheme to all irrigation systems in due course. If a Pani Panchayat could manage its affairs well, the Government will not hesitate to charge it with collecting water tariff.

As many as 50 Pani Panchayats have already been formed with the cooperation of different voluntary organisations and the Water and Land Management Institute a training and research organisation of the Water Resources Department.

The Union Water Resources Minister, Mr. Arjun charan Sethi, lauded the State Government for taking up the program. Mr. Sethi who visited one of the pilot projects, said the Center would extend a helping hand, if the whole State were to be covered under the program.

(The Hindu, 30/09/2000)
(Water Management, Orissa)

H(23). Nature's Fury Muddies the by-poll Waters

Nature's fury that had led to waterlogging at a huge tract of desert land inundating at least 10 villages two months ago holds sway as a major election plank in this remote Assembly constituency in Bikaner district. A cloud-burst in the last week of July, coupled with the release of excess water from the nearby Kanwarsen lift canal, had caused waterlogging near Lunkaransar. The gypsum present in the soil in high quantity formed a thick layer that did not allow absorption of water. The residents of 10 villages had to be evacuated while partial damage was caused to a number of other villages.

The Government's efforts to solve the problem by drilling bore-holes in earth have failed to yield any results so far. Water is going down in small quantity in only two of the holes and eight are non-functional. At this pace, the land may take another year to fully dry up but has, interestingly already unsettled the electoral balance. Apart from the waterlogging, the government's failure to

disburse timely relief to the victims of floods as well as the failure to rehabilitate them, paucity of power and water for irrigation, and the alleged irregularities in the payment of minimum wages for relief works during the drought spell dominate the scene in Lunkaransar.

(The Hindu, 29/09/2000)
(Waterlogging, Rajasthan)

H(24). Breach in Tidal Embarkments

A high tide in the Hooghly measuring 6.27 meters broke an embankment in the south-west part of the metropolis and flooded new areas during the small hours today as a fresh red alert was sounded for a more severe tide during the day. The State Government shifted over 3,000 people to safer places. The city has been under red alert since Tuesday last. An embankment near ayubnagar in the Garder Reach area gave way flooding the entire area, the Calcutta Municipal Corporation Commissioner, Mr. Debasish Som told PTI.

(The Hindu, 29/09/2000)
(Flood Hydrology, West Bengal)

IE(12) Release the Dam Water: Violent Farmers in Parched Chhattisgarh

"We have been caught in a Catch-22 situation. The water stored in various Mahanadi Project dams is already much below the minimum level to meet the drinking water needs," says an official of the Mahanadi Project.

According to the project's chief engineer, M. S. Chandel, 7.6 TMC ft water was stored in Gangrel Dam, 8.9 TMC ft in Dudhawa and only 2.1 TMC ft in Sondhoor. While the Dudhwa water can be released only to villages within its command, only one TMC ft water from Sondhoor can be brought to Gangrel through the feeder canal . "It won't even reach the tail end of the canals. If we release it, villagers may block its flow to other villages downstream and may trigger clashes," officials fear.

The situation caused by the unprecedented drought in Chhattisgarh and Nimar regions – which have witnessed less than 50 to 70 per cent of their average rainfall this summer. Hand-pumps in hundreds of villages in Jhabua, Dhar and Bad-wani districts have already gone dry and in a month nearly one-fourth of them may turn defunct.

(Indian Express, 28/09/2000, Yogesh Vajpeyi)
(Water Crisis, Chhattisgarh)

IE(13) Anticipating Drought Gujarat Saves Water

Metering of water, spraying of chemicals on reservoirs to reduce evaporation and deployment of police to prevent water thefts are some of the desperate measures being planned by the state government to tackle yet another drought.

As water sources in five major cities of Gujarat are likely to dry up much before the onset of summer, the government has worked out a plan to exploit groundwater in Ahmedabad, Vadodara, Rajkot, and Jamnagar and Bhavnagar cities.

It has decided to install meters at the Gavridad sump and at all water distribution zones in Rajkot to ensure efficient distribution and to

prevent wastage as well as overdrawing from certain areas. In view of frequent incidents of water theft from dams in Rajkot district, police would be posted round-the clock at Aji-3 Oond, Machchu-2, Sasoi and Bhadar reservoirs.

Chemicals like cityl alcohol will be sprayed on the water surface at all reservoirs in Saurashtra to reduce evaporation losses. Fishing leases will be banned during the months of scarcity to ensure that the chemical film on the water is not split. Rajkot City, which gets water every alternate day, may have to suffer further cuts after February, according to an official communique from the Gujarat Water Supply and Sewerage Board. The city then would no longer get water from Bhadar, for the dam water will be directed towards Jetpur town.

It has been decided that from March, an extra 30-lakh gallons of water would be drawn from the Aji-3 dam and the borewells in Wankaner-Jambudia-Vidi region. Since the Rajkot Municipal corporation is not equipped to get water from the Padadhari group scheme, it would construct a pipeline to the city in coordination with the Board.

Ahmedabad, Vadodara, Jamnagar and Bhavnagar will also have to depend extensively on ground-water and have water cuts at least two to three months before the on-set of summer.

(Indian Express, 28/09/2000)
(Water Conservation, Gujarat)

IE(14) Households Urged To Opt For Groundwater Recharging Units

It is only September and civil authorities across Gujarat are worrying about the supply of drinking water in the coming months. Water level in most reservoirs is low. Officials hope that by imposing water cuts from November onwards they may be able to conserve water for the summers.

On the other hand, they are also trying non-conventional methods of water conservation. While Vadodara Municipal Corporation officials are looking for new sources, a non-governmental organisation is trying to lend a helping hand.

Natural Resources Management (NRM)-a voluntary organisation – has initiated to help people install groundwater recharging systems, especially in residential areas of the city. The organisation has started the initiative with financial help from the Gujarat Ecological Commission (GEC).

The cost of installing recharging systems in households is Rs 10,000 and the commission has agreed to pay Rs 4,000 per house, while the owner would have to pay the balance of Rs.6,000. NRM president Tiwari said that the awareness for installing groundwater recharging systems in households needs to be spread, as this was the only viable option for the residents of Vadodara and would not be an expensive proposition either.

(Indian Express, 27/09/2000, Swati Mazumder)
(Water Conservation, Gujarat)

H(25). Dam Water Plays Havoc With Tribals

Bargi dam, completed in 1989, was filled with water in 1990. The dam has forced the relocation of about 1,00,000 people, and sub-merged more than 162

villages. Due to the struggle for resettlement from 1992 onwards, the Madhya Pradesh Government has handed over fishing rights to the ousts' federation. Meanwhile, the oustees have also fought for rights over the drowned area.

The study on health aspects should be extended to the other dams under construction in the Narmada Valley like the Sardar Sarovar, Maheshwar and Indira Sagar dams to avoid any catastrophe in future. It has further been demanded that further construction of these dams should be carried out only after review of all aspects, including impact on the health of the local communities.

(The Hindu, 27/09/2000)
(Dam Hydrology, Madhya Pradesh, Bargi Dam)

H(26). 500 Killed in Bengal Floods

At least 500 people have died in flash floods in West Bengal rendering lakhs of people homeless. The catastrophe that hit south Bengal struck Calcutta early this morning when the high tide flooded a part of the city's southern district. To make things worse, large parts of the city are likely to be engulfed in darkness as the rising Hooghly is threatening to affect the Bandel thermal power station.

According to an official estimate, the toll in the floods rose to 427 today with fresh deaths occurring in Nadia, Mindnapore and Howrah districts. The situation has improved but problem areas remain," the chief Minister, Mr. Jyoti Basu, said. Air-dropping of food and relief operations by the Army continues in the flood-ravaged districts such as Burdawa and Murshidabad. High alert was sounded on both sides of the circular canal in north and central parts of the city following rise in water level due to high tide in the Ganga today. Hundreds of people residing in Nar-keldanga, Entally and Ultadanga and other areas close to the canal have been alerted by the police.

Meanwhile, the deputy director of the Indian Meteorological department, Mr. Mihir Guha, today claimed that he had forecast heavy rains in south Bengal districts and sent reports to the State Irrigation Department. The State Government, however, refuted such a claim saying that other than routine predictions, the department had not made any communication.

(The Hindu, 27/09/2000)
(Flood Hydrology, West Bengal)

IE(15) Trains Disrupted, Rlys. Blame WB Govt. for 'man-made' Floods

In another dig at the West Bengal government, the Railways was has termed as "unwise", the release of water from two barrages of Masanjore and Tilpara that led to devastating floods in seven districts and paralysing train services.

"The government knows that it rains heavily during this part of the year and water stored at Massanjore and Tilpara barrages should be at a level that additional water need not be released in such a drastic manner," General Manager, eastern railway said. He added that we will take up this matter with the state government and tell them to be vigilant round the year.

(Indian Express, 26/09/2000, Sabyasachi B.)
(Flood Hydrology, West Bengal)

H(27). 15m Still Marooned by W. Bengal Floods

As many as 240 people have been killed and 15 million marooned in the devastating floods in West Bengal, with the army working for the seventh day today to provide succour to those affected.

Army jawans were finding it difficult to enter the remote areas in Kandi district because of strong currents, the sources added. Discharge from the DVC and Massanjore dams have been further reduced.

One million people have been rescued so far, out of the 15 million affected in 118 blocks and 30 municipalities of the seven flooded districts. Kandi sub-division in Murshidabad district has borne the brunt of the floods. Also, balagarh in Hooghly district and Kalna in bardhaman district suffered extensive damage.

Train services from Calcutta to North Bengal remained disrupted for the seventh day toady. Indian Airlines has decided to operate additional flights on the Calcutta.

(The Hindu, 25/09/2000)

(Flood Hydrology, West Bengal)

H(28). Contribution of Large Dams Poor: Report

The contribution of large dams to increased foodgrains production in India is only 10 per cent contrary to largely held belief, is a finding of the India country Study (ICS) on large dams conducted by a consultant team of prominent Indian experts for the World commission on Dams (WCD). The final report of the commission will be released by Mr. Nelson Mandela in London later this year. The commission has had two sittings in India-at chennai and in New Delhi.

The team of Indian experts include former Water Resources Secretary, Mr. Ramaswamy Iyer, former Director of Madras institute for Development Studies, Mr. Nirmal Sen Gupta, faculty at Indian Institute of Public Administration (IIPA), Mr. Shekhar Singh and Mr Pranab Banerjee and former Additional Secretary in Central Water commission, Mr. R. Rangacharya.

More than Rs.1567.76 billions, which is two-third of the water resources budget of the nation, has been spent on large river water projects in the last 50 years till March, 1997 without any serious effort to evaluate the impact and performance of large dams.

The study comments on what it says is the poor track record of large dams in India on all accounts, bet it social, economic, environmental or financial. It says that costs are systematically underestimated and benefits exaggerated to show the requisite benefit cost ratio. During implementation, there are enormous escalation in costs, considerable delays and changes in design and scope of the project resulting infall in achieved yields.

Following the findings of the reports, south Indian Network on dams Rivers and People, and independent research and networking body, has demanded that an independent , "credible" national commission be set up to review the costs, benefits and impacts of large dams, including who has paid the costs for whose benefits. Pending the setting up of such a commission, the network has demanded that all existing large projects be put on hold.

The report talks about the lack of political will, legal framework and planning infrastructure to redress the "substantial negative impacts" that large dams have on environment and society. Apart from not acknowledging the social and environmental costs, most of the dams were also not required to internalize

the costs of preventing, minimizing and mitigating most of the adverse impacts, which have been significant. The report urged for other, alternative methods for achieving the objectives that set out for large dams.

The report recommends that for better management of water resources, needs assessment for the given area be done, the needs should be prioritized and options assessment is done to find the optimum way of satisfying the needs. The available options are assessed in terms of cost viability including social and environmental. It recommends a national rehabilitation policy, with legal backing, based on land for land for displaced people. Those displacement was done.

The findings suggest that the problems of drainage, waterlogging, salinity and recurring losses against operation and maintenance costs may even require decommissioning of some existing dams.

The findings of the study will be incorporated into the final report of the commission, a body endorsed by various stakeholders including the government of India, the Narmada Bachao Andolan, representatives of the industry, international agencies including the World Bank.

(The Hindu, 24/09/2000 , Gargi Parsai)
(Dam Hydrology, General)

H(29). Western Orissa Heading for Water Scarcity

The western Orissa districts of Bolangir, Nuapada, Bargarh, sambalpur, Jharsuguda and Deogarh are heading for a severe drinking water crisis in the coming months as water sources in the region have started drying up due to highly deficient rainfall in July and August.

As not a single village pond or water bed has been filled up by rain water so far, water will become a major problem much before the commencement of summer. Rainfall in the first two weeks of September has also been disappointing. The State recorded 64 mm rainfall during the two weeks against 150 mm during the corresponding period last year. The drinking water scarcity would be acute if it does not rain heavily in the coming days.

In many places, the ground water level has already gone down resulting in decrease of water level in bore-wells and tube-wells. The water quality of many tubewells has also become poor and unusable for drinking purposes. The quality of water in the village ponds is likely to deteriorate fast as people and the cattle depend on the same. In places such as Sohela, Padampur and Paikamal in Bargarh district and Loisingha and Titilagarh in Bolangir, the water level in the village ponds is only a few feet deep.

In a letter to the Prime Minister Mr. Vajpayee, the Chief Minister, Mr. Naveen Patnaik, has under-lined the need for more tubwells to provide drinking water.

It may recalled that Titilagarh town had suffered acute drinking water scarcity last summer and water was hauled by train to meet the requirement. This had happened despite rainfall being normal in the region last year. Although water resources are abundant in the State, the authorities admit that development of ground water was only 10 percent. The authorities, which have not done the needful in the past, are now initiating measure to cope with the impeding water scarcity.

(The Hindu, 24/09/2000, Prafulla Das)
(Water Crisis, Orissa)

H(30). Drought-Hit Rural Orissa Facing Migration

With crops damaged because of scanty rainfall this monsoon and no work available in the villages to earn a livelihood, a large number of people have started migrating from the western Orissa districts to urban settlements in and outside the State. The situation is likely to worsen in the coming days.

The State Government, which claims to have taken a series of measures to cope with the drought situation in the western districts, has not been able to start food-for-work programs in the affected region till date. The cash-strapped Government is still waiting for the center to provide rice for the purpose.

In fact, there is nothing new in people from the districts of Bargarh, Sambalpur, Jharsugula, bolangir , Nuapada and Kalahandi going for work intowns in and outside the State. Every year, small farmers and daily laborers from these districts go for work in distant places for a period ranging from 15 days to one month before the harvest season. But the situation is different his year in the non-irrigated areas where the crop has been severely damaged.

(The Hindu, 23/09/2000, Prafulla Das)
(Drought Hydrology, Orissa)

H(31). Acute Drought In Western Orissa

The spectre of drought is strikingly visible in the non-irrigated high land areas of the tribal dominated western Orissa districts with the kharif crop suffering severe damage due to highly deficient rainfall since July.

Though drought is not a new phenomenon in western Orissa and it is common knowledge that in a year like this damage to the crop could be avoided to a great extent by increasing irrigation cover, successive Governments in the State have not been able to do the needful.

While many existing irrigation systems are lying defunct in the region, the authorities are now striving to do wonders overnight. The district administrations have been asked to do many jobs as one go ensure repair of lift irrigation points, construct cross bunds, streamline the public distribution system and help the farmers in saving the crop wherever possible.

The State Government has already pressed the panic button. The Chief Minister, Mr. Naveen Patnaik, other Ministers and almost all politicians are touring the affected districts and promising help. Mr. Patnaik has also written to the Prime Minister, Mr. Atal Behari Vajpayee, for dynamical assistance to deal with the unprecedented drought.

The situation in other parts of the State is also not encouraging. Of the 30 districts while vast areas in seven are reeling under drought, 15 other districts – Rayagada, Kalahandi, Kendrapara, Angul, Jagatsinghpur, Keonjhar, Mayurbhanj Boudh, Phulbani, Dhenkanal, Jaipur , Sonepur, Cuttack, Puri and bhadrak –have also recorded "deficient rainfall". The crop has been partially damaged in the non-irrigated high land areas of these districts too.

The eight districts where the situation is normal so far are Balasore, Nawrangpur, Koraput, Gajapati, Khurda, Nayagarh, Malkangiri and Ganjam. In the prevailing situation, no amount of rain can help save the crop in the high land areas now. Whatever the situation, the farmers in the affected districts are in need of help in many forms –prompt help to save the remaining crop, supply of seeds for Rabbi-cultivation and rice at a subsidized rate to fight hunger in the coming days.

(The Hindu, 22/09/2000, Prafulla Das)
(Drought Hydrology, Orissa)

IE(16) Institute Strikes Gold, to Use Silver for Getting Safe Water

The Center for Application of Science and Technology for Rural Areas (ASTRA) is developing a purification system using the bactericidal properties of silver that will provide clean and safe water at low cost.

Two prototypes of the system have been developed by the organisation at the India Institute of Science (IISC) – one with a normal candle coated with silver and the other with clay beads coated with silver, H.N. chanakya, professor at ASTRA said.

Silver is not soluble in water and prevents bacterial multiplication, adding that in water, howsoever clean, has scope for secondary contamination. Bactericidal properties of silver, however, eliminate even secondary contamination by destroying bacteria.

Prof. Chanakya said a right proportion of silver is needed for best results on bacteria and enzymes. Nine gm of silver in about 1.5 kg of clay beads or on the candle has been found to be right for both prototypes for a specific amount of water. Field trials are needed to see how people accept this passive water purification method, he said. Silver was widely used in ancient and medieval times in India and Europe for water purification until chlorine came into use. Chlorine has adverse effects because of which its use to purify water has been banned in the West and in developed countries.

"There is no policy in the country on clean drinking water. We are looking at a method, which even a potter in a village can use for purifying water as low cost," he said. Copper can be an alternative to silver as it has bactericidal properties and is cheaper, Prof. Chanakya said.

(Indian Express, 21/09/2000)

(Water Quality/Water Purification, General)

IE(17) For First Time, Permanent Water Not a Mirage

For the first time in 35 years of its existence, Gujarat's capital Gandhinagar can hope for a permanent source of drinking water, with the government proposing to construct a weir across the Sabarmati river. This comes in wake of reports that the state is heading towards another drought.

The estimates by the irrigation department come to Rs 18 crore. Minister for Small and Medium Irrigation Schemes Nitin Patel has expressed his approval. Confirming this, Irrigation Secretary M.S. Patel told The Indian Express here yesterday that the project designs would be ready by the next week. He said the agency to construct the weir had also been decided upon. "I have already discussed the project with the minister and he is expected to clear the file", Patel said, adding that the Minister had also visited the site of the proposed project.

After the project gets a nod from the government, the work on it will start in January and will be completed in a year, he said, pointing out that the proposed weir will have 400 meters of width and will be six feet high. When constructed, it will not only help recharge the groundwater of Sabarmati river but will also provide drinking water to over 1.75 lakh population of the Capital.

Chief Engineer (Capital Project). P.J. Patel said the weir, when completed, would offer a permanent solution to the drinking water problem

facing the residents of Gandhinagar. Of late, this problem has compounded not only by the failure of monsoon for the last two seasons, but also because the Dharoi dam waters have stopped flowing into the Sabarmati river in the wake of the Raska Weir project for providing drinking water to Ahmedabad city.

Besides the rain water, a large quantum of storm water received by the capital during the monsoon will also start flowing into the river with the two phases of the multicrore storm water drainage project having already been implemented in Gandhinagar. The storm water will thus help augment the reservoir level of the weir, Patel said.

The Chief Engineer said that at present, the 47 borewells in different sectors were the only source of drinking water for the people of Gandhinagar. The total drinking water requirement in Gandhinagar is 4.375 million liters per day (MLD), against which, the supply of just about 4 MLD is being maintained through the borewells. The weir project will definitely reduce the pressure on the groundwater that has already been identified as an over exploited zone by the Central Ground Water Authority.

(Indian Express, 17/09/2000, Bashir Pathan)
(Water Availability, Gujarat)

H(32). State Set to Utilise Krishna Waters: CM

The Chief Minister, Mr. S.M. Krishna, said here on Saturday that works on the India branch Canal from 64 km. To 120 km. Was in an advanced stage and water would be released in the canal in December next. It would irrigate one lake acres of lands.

Talking to persuasions after reviewing the district's development schemes, Mr. Krishna said the Almatti Left Bank Canal would also be commissioned soon. Work on the Almatti Right Bank Canal and Mulwad and Gutti Basavanna Lift, Irrigation Schemes would be completed in a year. Replying to a question, he said the Almatti dam was ready, and the date of its formal dedication to the nation would be decided soon. The water level in the dam stood at 515 meters, and water would not be stored beyond that level this year.

The Chief Minister said there was apprehension that Karnataka would not be able to utilise its share of Krishna waters. But with the completion of the Almatti dam, the State was now in a position to utilise its share, he claimed.

Work on four barrages on the Bheema, languishing for want of funds, would be completed by next year, Mr. Krishna said. Expressing concern over the depletion of the groundwater table he said apart from implementing more watershed programs, at least one tank each in all the 740 hobties would be either desalted or reconstructed. The Government had sent a Rs.1,000 crore proposal to the World Bank in this regard. He announced that the Government had agreed to spend Rs.53 crores on improving the drainage system in Bijapur city.

(The Hindu, 17/09/2000)
(Surface Water Hydrology, Karnataka, Almatti Dam)

IE(18) Gujarat Fears Drought Worse Than Last Year's

The Gujarat Water Supply and Sewerage Board Member-Secretary K. B. Patel admits that a serious situation is likely to arise and says a scarcity action plan will be ready in a couple of days. Entire Gujarat, except the southern districts, received below average rainfall. This rain was sufficient to fill up the small check-dams but not the big dams and reservoirs, on which the state is mainly dependent for its drinking water and irrigation needs.

Many officers blame the check-dams for the problem. They say that in Saurashtra, where the rainfall is always deficient, thousands of check-dams were built in the catchment areas of the big reservoirs. These check-dams trapped most of the rain water, allowing very little to flow into the reservoirs.

Bhadar dam in Rajkot, one of the biggest dams in Saurashtra, is a typical case. While the check-dams in its catchment area were filled to the brim, Bhadar has just the dead storage level. In fact, officials of the Water Supply and Irrigation Departments were against the construction of too many check-dams in the catchment areas of the big reservoirs right from the beginning.

Nearly half of the new 10,000. Check-dams, which were set up during the past few months, were filled and helped recharge the groundwater at the few places where it had rained. In those areas, the people are happy as they have enough water to tide over the season.

Some areas, like Ahmedabad city and its surroundings, received very heavy rainfall, causing extensive flooding, but the water went waste as there is no dam or reservoir in these areas.

(Indian Express, 17/09/2000)
(Water Crisis / Dam Hydrology, Gujarat)

IE(19) Chhattisgarh Drought Spurs Farmers' Exodus

Over 400 farmers from Patan region of Durg district recently headquarters, demanding release of water from the Tandula reservoir. However, the district administration has refused their demand.

According to official sources, the water level at Tandula has gone down by 18 feet (28 per cent of its total capacity); the level at Gondly is down by 14 feet and up to 18 feet in Khorkhar. Therefore, no more water can be released, officials say. According to sources in the administration, more than 1,100 villages are drought-affected in Raipur district. In Kashdol, Palari and Bilaiugarh regions, more than 50 per cent of the crops have dried up.

(Indian Express, 17/09/2000)
(Water Crisis, Chhattisgarh)

IE(20) Rains Play Havoc In Eastern U.P.

Heavy rains in the northern and eastern districts of the state for the last 10 days have played havoc with the people of the area. The state Government as usual is waiting for the written requests for the fund by the district magistrates of the flood-affected districts.

Before the onset of the rainy season every year, the Government claims that all arrangements have been made to save men and the crops

from the flood fury. But every year floods breach dozens of bunds submerging thousands of villages and claiming a large number of lives.

Relief works have not yet been started. The PAC jawans who have specially been trained for the flood relief have not yet been sent to the affected areas. The Army has also been alerted, but not sent.

Floods in 44 of the 83 districts have so far claimed at least 320 lives and completely damaged the kharif crops in 2.03 lakh hectares. More than 600 cattle heads have also perished. About 20 lakh people have been affected by the floods.

About 2655 villages have been submerged and 5352 houses have collapsed. Most of the people of Domariaganj town in Sidharth Nagar district on the Indo-Nepalese border have fled the town and taken shelter in safer places. The worst affected of the 44 districts are Bahraich, Shrawasti, Gonda, Balrampur, Basti, Sant Kabir Nagar, Gorakhpur and Deoria districts.

All the major rivers in the state, Ganga, Ghaghra, Yamuna and Rapti are in spate following heavy rains in the catchment areas.

The floods have reached the road between Bahraich and Balrampur disrupting traffic between the two districts. Reports of breaches on the Baraich and Lucknow road have also been received.

In the state about 28.28 lakh hectares of land in flood-prone. Of the area 8 lakh hectares of land is the worst affected. The state Government has chalked out a detailed program to control floods at the cost of Rs 500 crore. The World Bank has agreed to fully finance the project. After the implementation of the plan 4.09 lakh hectares of land can be saved from the flood fury.

The NABARD has sanctioned Rs. 16.40 crore to check soil erosion by the Yamuna river. The state Government has also sought Rs 1335.91 crore from the Center for raising and strengthening of the bunds, for the construction of 8570 km new drains and for renovating 4417 km old drains.

(Indian Express, 13/09/2000, R.B.Singh)

(Surface Water Hydrology / Flash Flood, Uttar Pradesh)

H(33). CM Releases Rs.110 cr. for Flood Relief

The Government on Thursday released Rs.110 crores to enable District Collectors to continue the relief and restoration operation in the flood-affected areas. A sum of Rs.13 crores would go to Hyderabad where the damage was "intensive and extensive," Rs.10 crores each to Guntur and Khammam, Rs.9 crores to Kurnool, Rs.8 crores each to Prakasam, west Godavari and Nalgonda, Rs.6 crores each to Cuddapah and Warangal, Rs.5 crores each to Ranga Reddy, Krishna, Adilabad and Medak and Rs.4 crores each to Nellore, Kaimnagar and Nizamabad. The allocations, he said were to be spent on relief, including input subsidy for the crops lost.

The Chief Minister said the floods, abated with the Godavari and its tributaries, were receding at all the places with the rain coming to end, at least for the time being. The water level at Bhadrachalam, which reached 54.6 ft on Wednesday, fell to 48.8 fit by this morning. The toll in the earlier floods caused by heavy rains reached 162 with Guntur topping the list with 34 deaths while it was four in the latest phase under the Godavari. Mr. Naidu said seeing the severe damage caused to infrastructure some organisations were coming forward to

help the State. The Department for International Development of the U.K. had offered to take up a special project, both for restoring public utilities like roads and rehabilitating the affected with benefits like housing.

About the damage under the Godavari floods, the Chief Minister said 285 villages were affected in Khammam, Karimnagar, Warangal, Nizamabad, West Godavari and East Godavari.

(The Hindu, 1/09/2000)
(Flood Hydrology, Andhra Pradesh, Godavari)

August.2000

DH(1) Center's okay for storing water in Almatti dam

The much-awaited clearance from the Center to legally store water in the controversial Almatti reservoir has been received by Karnataka, according to Major Irrigation Minister H K Patil.

He said that under this stage, six major irrigation schemes had been taken up – Almatti left bank canal (77 km to 103 km), Narayanpur right bank canal (95 km), Rampur lift irrigation (51 km), Almatti right bank canal (121 km), Mulwada lift irrigation (128 km) and India lift irrigation project (96 km). These projects were expected to irrigate 1,97,120 hectares spread over Bijapur, Bagalkot, Raichur and Gulbarga districts. The work on the Narayanpur right bank canal and the India lift irrigation project was on. The Government intended to complete Stage II in the next two years and the total water to be utilised was 54 tmc. The estimated cost for the remaining works was Rs 2,003 crore and the total cost Rs 3,437 crore.

Mr Patil said the erection of crest gates at the Almatti dam on a trial basis had been completed. The reservoir was in a position to impound water up to 519.6 mts. By restricting the height of the dam to 519 mts from the planned 524 mts, power generation would be 26 per cent less than planned, he pointed out.

(Deccan Herald, 31/08/2000,
(Dam Hydrology, Karnataka, Almattti Dam)

H(34). Poliuted Water the bane of Bhopal

The capital of Madhya Pradesh is confronted with a severe crisis these days as residents in many neighborhoods across the city get contaminated water, most unfit for consumption.

The water supply system in the State Capital is run and administered by the Bhopal Municipal Corporation. Every Year, during the monsoon season, complaints shoot up in the city with regard to the supply of contaminated water.

The problem of "rotten" drinking water supply in the city has reached such alarming levels that the citizens were even forced to knock at the door of the State Human Rights Commission. The Commission took a serious view of the problem and got water samples from different areas and these were tested by the State Research Laboratory of the Public Health Engineering Department. Some of these samples, particularly two of them from tube wells used for water supply, have tested positive for bacteria much beyond the permissible limits.

It has also been established through tests that water being supplied through a tap in Jumerati area of the city, when samples were collected, was polluted by sewage. When contacted, a Human Rights Commission official confirmed test reports showing how polluted water was being supplied to residents in many parts of the city. He said the Corporation had taken up testing of tube wells and disinfecting them.

(The Hindu, 27/08/2000)

(Water Pollution / Potable Water, Madhya Pradesh)

IE (21) Water, Water Everywhere.....

Elsewhere in Gujarat, water is a rare and precious commodity, procured after much scrimping and saving and after walking miles. But in Hansot taluka in Bharuch district in south Gujarat, there's an embarrassment of water, which has caused thousands of hectares of land to go barren. It's possible in Hansot, where the level of ground water, which is highly saline, is rising and lapping at the doorsteps of villagers. Water's not the problem here: its abundance is. Here, there are no children being lowered into wells to scrape the last drop they find; instead, villagers frantically spread plastic sheets over their floors to prevent the salt-heavy water from wetting their mud floors. " If they don't , the occupants will be walking about in slush," says a villager from Balota village, Secretary of the Center of Environment, Science and Community (CESCOM), Ashok Rathi, who has been campaigning on the villagers' behalf, says the capillary action of water wets the floor and walls, causing the mud and dung to come off.

The houses has been collapsed and other villagers are in fear that same will happen with our houses as the base and walls of their huts eaten by the underground salt. Lack of proper drainage facility to drain the water into the sea has compounded the problem. Ironically, Hansot, located on the Arabian coast, was barren and inhabited centuries ago. But Narmada and Kim rivers that meet the sea at Hansot washed up silt and turned the barren locals into cultivable land.

Villagers say that The increasing water table has brought to the surface the sediment deposits that were buried deep beneath the surface. They alleges, that a pipeline laid by an industry blocked the natural outlets, causing waterlogging. " Neither grass nor weeds grow on many low-lying patches," he says. And worse Industrial estates in the region release their poisonous effluents into the creek, which is a drinking water source for many villages. They appealed to government to bring down the water table.

(Indian Express, 27/08/2000, Miland Ghatwal)

(Ground water Hydrology/ Waterlogging, Gujarat)

IE(22) Industrial Effluents leak into Rajkot Water Table: Handpumps are Yielding Foul-smelling, green- coloured water

The 150 odd electroplating units in Rajkot, particularly in the Patel Nagar area, pose a serious health hazard for residents. Experts at the local cancer hospital say that the high metal content in the effluents released by the units, which often contaminates ground water, could cause cancer. For the past few days, handpumps in Patel Nagar have been yielding green, foul-smelling water and residents blame electroplating units, which release untreated effluents into underground tanks. And this is not the first such incident. Over the past few years, there has been a sharp rise in the number of electroplating industries in

the area which serve the large number of automobile parts, stove and diesel engine industries in the city. Most of these units are situated in Patel Nagar and Vijay plot areas, while others are scattered across the city.

Despite a Supreme Court directive that industrial effluents cannot be released without being treated, these units continue to release untreated effluents, or store them in underground tanks. These effluents, containing metals like nickel, chromium and Zinc, often make their way to the underground water table. GPCB (Gujarat Pollution Control Board) sources also admit that in past too residents had approached them with samples of the contaminated water from their hand pumps or deep-wells, with the number of complaints rising during the monsoon.

(Indian Express, 14/08/2000, Parag Dave)
(Industrial Effluent / Ground Water Hydrology., Gujarat)

H(35). Harike lake to regain its past glory

One of the six most important wetlands in the country – about 60 km from Ferozpur, Punjab. Worse, the fast spreading hyacinth plants have reduced 41 sq.km. of open water to a mere 28 sq.km, leaving only those much space for migratory birds. Experts' point out the growth of hyacinths in the Harike wetland, which came into being in 1952 as a result of the construction of a barrage at the confluence of Beas and Sutlej rivers, has pushed it to the brink of an ecological disaster.

A turn around , however, has begun. " Operation Sahyog", initiated jointly by the worried Punjab Government and the Army, with expertise from the World Wildlife Fund, has been set in motion to restore the lake to its former glory.

(The Hindu, 10/08/2000 , Sutirtho Patranobis)
(Environmental Hydrology / Lake Hydrology, Punjab, Harike Lake)

IE(23) Hotel With Rain Harvesting System

Delhi Chief Minister on Tuesday inaugurated a rooftop rain harvesting system at Hyatt Regency Hotel. With this, Hyatt Regency becomes the first hotel to come up with such a system. The system took about a month to be set up. The hotel has put in place this system to harness nearly 70 lakh liters of rainwater and the water from its swimming pool plant every year. This water was earlier drained into the storm water drains in the area. The rainwater will be channelised from the rooftop with pipes into a reservoir on the hotel premises. Sand and pebbles will serve as a natural filter for it.

(Indian Express, 10/08/2000)
(Water Conservation, New Delhi)

DH(2) Iron slurry leakage - Villagers fear disastrous effect on water & agriculture

Even after 20 days, while Kudremukh Iron Ore Company Limited (KIOCL) is yet to repair the point of slurry leakage in its pipeline at Kanyalu near Karkala, the villagers are worried about the possible fallout of the severe pollution of the Yennehole stream caused by this.

While the villagers are anxious of its effect on drinking water, agriculture, forest and fish-life, the government agencies like the Pollution

Control Board does not really seem to bother much about the assessment of the possible damage.

The massive leakage was reported on July 17 from the pipe at Kanyalu in the Naravi forest area and the KIOCL suspended its production and transport of slurry from Kudremukh to Mangalore. The KIOCL has laid an underground pipeline of about 100 kms. to transport the slurry.

As admitted by the company itself, the amount of slurry which flowed out of the pipe could be about 4000 tonnes and the likely 'loss' suffered by the company is to the tune of 50,000 US dollars. These figures themselves prove the gravity of the problem.

Much of the leakage has flown into the Yennehole stream, which is visibly polluted for about 20 kms. stretch and a part of the leak has spread to the forest. Through small irrigation canals, the slurry has reached the nearby agricultural fields also. The villagers who are dependent on Yennehole stream for drinking water, are now facing untold misery. Going by the charge leveled by Karnataka Vimochana Ranga, the KIOCL personnel themselves declined to consume water from Bhadra river in the past fearing pollution and decided to lift water from Sita river which flows 8 kms away from the Kudremukh company.

Ironically, the Pollution Control Board maintains that Yennehole pollution will not cause much harm. On the contrary, the villagers Devappa, Ananda Devadiga, Geetha etc have a different story. The Yennehole stream has been blackened and it is impossible to drink the river water. The fishes, which were seen earlier, have become invisible after the slurry leakage.

According to Pollution Board officials, a Technical Advisory Team consisting of Prof. Halappa Gowda, Prof Lahiri and Prof Manjunath among others, has visited the 'spot' and concluded that the slurry will slowly deposit at the bottom of the stream and hence the water will be fit for drinking. They have also not noticed any fishkill so far. But many villagers doubt whether Pollution Board officials have really visited the right spot because it is inaccessible to vehicles and are compelled to walk a few kilometers. Even the KIOCL has not been able to correctly locate the point of leakage till now as the pipe is still deep-buried underground. It is a dense forest and labourers are hardly coming forward to work.

Moreover, Forest Department has consciously not allowed the KIOCL to take vehicles in the forest to avoid every possible damage to be caused to the forest due to such an activity.

When contacted by Deccan Herald, Deputy Conservator of Forest Madhu Sharma said KIOCL has been allowed to only conduct its repairs manually. After 20 days, Kudremukh has not addressed the problem of leakage. However, KIOCL officials claimed that they will complete the repairs within one week. Ironically, they have been saying from the beginning that thetime required for them to complete the task is just one week and now three weeks are almost over.

Meanwhile, there are reports about the uselessness of the whole 100 km pipeline, which is more than 20 years old.

(Deccan Herald , 5/08/2000, Varadesh T Hiregange)

(Water Quality, Karnataka, KIOCL)

July, 2000

IE(24) Ckeck Dams Deprive Rajkot Reservoirs of Water

The Bhadar and Aji reservoirs, on which the city and the nearby towns of Jetpur and Gondal are dependent for their drinking water needs, have little water to show even after the second spell of rain in the region. They did not receive any water after the season's first rain last month. Officials in the collectorate say the rainwater was getting trapped in the 1400 check dams built in the upstrem areas. Only when all the check dams are full will the reservoirs receive substantial water. They said Bhadar and Aji received whatever water they have only after about 900 of the check dams overflowed after the second spell of rain. During this month, the water level in Bhadar was 1.4 m against the storage capacity of 9.36 m while Aji-I had 0.87 m against its storage capacity of 884m. Rajkot' official (A.E.) said that the check dams are not preventing the filling of the reservoirs. He said that the total capacity of the check dams was very little. The problem had arisen because of insufficient rain. The Bhadar catchment had received only 108 mm of scattered rainfall. But other officials disagree. They say that if there is average rainfall, as predicted by the Meteorological Department, the water level in both reservoirs may just reach to 5 m-mark.

(Indian Express, 22/07/2000, Himanshu Kaushik)
(Dam Hydrology, Gujarat)

H(36). Satellite Helps Locate U.P. Ground Water Sources

Remote sensing technology is helping to locate ground water sources in Uttar Pradesh. The state-owned Remote Sensing Applications Centre (RSAC), has conducted a study of sub-soil and underground water besides inundated and snow-covered areas.

A spokesman of the State Science and Technology Council said the RSAC located 51 sites for minor Irrigation department, eight for U.P. Avas Vikas Parishad and three for Public Works Department for installing tubewells.

With the help of satellite pictures, the RSAC has been studying snow-covered areas of the State under a Central Government project to prepare an utilisation plan of water for distribution, irrigation and power generation. A snow melt run off model made by it is expected to help calculate in advance how much Bhagirathi water will be received in the summer, the spokesman said.

The RSAC studied satellite pictures between 1988 and 1996 and conducted a field survey analysing speed of river and changes in its water level from May to October every year. It recently took up a project funded by the district rural development authority to locate water sources in Farrukhabad and Jalalabad.

To recharge irrigation and underground water, sites were selected for farm ponds, check dams, deep tubewells, recharge wells, injection wells and pump canals and two technical proposals prepared.

It also did commendable work in studying integrated water resources in selected parts of Himalayan region of the State, which included Someshwar in Almora and Bhimtal in Nainital. The Centre prepared hydromorphological, drainage and sub

soil water maps mentioning contour, road network, settlement locations, land use, land cover, elevation slope and inspect. In some selected areas resistivity surveys was done and all statistics coordinated to prepare an action plan. In Udhamsingh Nagar the chemical analysis of water samples was also conducted. The RSAC also undertook a Central Government funded project for the U.P. Minor Irrigation Department for tubewell boring in Lucknow, Jhansi, Faizabad, Allahabad, Gorakhpur, Azamgarh, Varanasi, Chitrakoot and Vindhyachal revenue divisions. Of the 262 sites surveyed for the purpose, 182 were found appropriate.

At present the RSAC is working on a Central Government scheme for assessment of ground water resources in the upper region of Barkha watershed and Velan river catchment area in Sonbhadra district.

It is also working on a Gas Authority of India-funded project to study the changes in the flow of Ganga, Ramganga, Gambhiri and Kali rivers in Hardoi and Farrukhabad districts to save the nearby pipeline from any possible damages. The IRS-1B LIS-2 satellite pictures of the 1990-1998 period have been studied and the topographic maps with all the technical details prepared. In the second phase, IRS-1C LIS-3 pictures will be studied for mapping the flow of these rivers in 1999.

The RSAC has also taken up mapping of flood risk and inundation zones in Ghaghra river system. The basic features have been collected and maps prepared which are being digitised.

(The Hindu , 20/07/2000)

(Remote sensing/ Ground Water Hydrology, Uttar Pradesh, RSAC)

IE(25) Unshared Waters: A Non-Political Water Policy Will Have Better Prospects

It is no surprise at all that the Union Government has been forced to beat a hasty retreat on its repeatedly asserted resolve to formulate a national water policy. It took only a few hours at the fourth meeting of the National Water Resources Council in New Delhi last week for the states to reduce the policy to an issue of federalism and reject it on that ground alone. The response was predictable indeed in the light of the country's experience of long years, particularly in relation to inter-state riparian disputes. The proposal for formation of a Central River Basins Authority as part of the envisaged policy could have found no acceptance, when even bodies set up to facilitate inter-state water-sharing have been unable to function effectively. The latest example is the Cauvery Water Authority, which has spelt no real solution to the long-running dispute between Tamil Nadu and Karnataka. No such mechanism has worked, either, in similar other dispute made the more intractable by irrigation projects, including the construction of Dams. The proposal for guidelines on sharing of river waters as part of the promised policy had no great prospect of all-round acceptance, given that even the self-evident need for some restriction in this regard on upper-riparian states has thus far remained beyond explicit recognition by a cynically circumspect New Delhi. Predictable as the rejection of the idea of a national policy on a vital natural resource was, the Centre would have done better to present it in a more acceptable manner.

This does not mean, as it is all too often presumed, that the Centre should have made it more of a political exercise. Experience makes it clear that there is little or no political leeway for the Centre in inter-state water imbroglios. There is none for the simple reason that none of the political parties, including

the avowedly all-India ones, is ready to take a national view of such matters. The Centre may well muddy the waters further by appointing itself an arbitrator in the disputes. What it can present more profitably is a positive case for inter-state co-operation in the place of these endlessly recurring conflicts. The states and the country need to be presented, of course, the larger picture of the wonder that integrated development of water resources will spell for India and , as some studies show, even the subcontinent, even more important in the immediate context will it be to show that inter-state exercises on the subject can be far more creative than a division of scarce, disputed resource, Changed crop patterns on either side, it has been suggested for instance, can help to produce a Cauvery solution without tears and tribunals.

Courageously innovative initiatives for ground-water conservation in some drought-prone district, too, are illustrative of a positive and practical water policy that is assured of popular support. The Centre can best promote such initiatives, not by offering a Central groundwater " authority" as it has unsuccessfully sought to do, but by pledging unstilted assistance to states for the objective. A national water policy is an idea that must be persisted with. It is an idea whose time will come as soon as both the states and the Centre begin to see it in more positives than political terms.

(Indian Express, 13/07/2000)
(Water Policy, General)

IE(26) Meet on Draft Water Policy Today

National Water Resources Council (NWRC) chaired by Prime Minister and to be attended by the chief ministers is slated to discuss some controversial proposals relating to water resources. One of them is a move to transfer water from the State list to the concurrent list, a proposal which has been opposed by several States including some those ruled by parties friendly to BJP. The opposition stems from the feeling that if water resources are transferred to the concurrent list in the Constitution it would infringe upon the rights of the states.

Similarly, several States are also opposed to a clause in the draft water policy, which provided for statutory powers to the proposed river basin organisations for the management and development of river basins. This, they feel, would turn the Centre into a 'regulator' from being a 'facilitator', an anachronism at a time when the buzz is more autonomy for the states.

The draft says that these river basin organisations would prepare comprehensive plans taking into account the needs and priorities of the states so that water resources are put to optimum use." The responsibilities regarding the regulation and development of inter-state rivers to the extent declared by parliament by law to be in public interest lie with the central government. Necessary legal and others steps may be taken to facilitate development and management of inter-state river basins," it says.

Evolving a set of national policy guidelines for sharing of inter-state waters has also been envisaged in the draft, which again is a point of controversy. Most of the states, especially the lower riparian ones like Tamil Nadu, Madhya Pradesh and Andhra Pradesh, are deadest against these guidelines. They would prefer the existing mechanism of courts and tribunals to deal with inter-state river disputes.

(Indian Express, 07/07/2000, B.S.Nagaraj)
(Water Policy, General)

H(37) Saraswati River holds key to Ground Water Reserves

The river Saraswati, enshrined in mythology as one of the great rivers of India, may hold the key to recharging ground water reserves in the Thar desert, feel experts.

Desertification of the Thar region in western Rajasthan began 3,000 to 5,000 years ago when the mighty river dried up and was considered "lost" for centuries.

However, during the past three decades, research and integrated field activities to identify the palaeo course of the river had yielded positive results, Mr. P C Chaturvedi and Mr. P C Chandra of the Central Ground Water Board, Lucknow, stated in a joint paper presented at a national seminar on ground water management strategies here last week.

The paper, "Artificial Recharge of Unsaturated Zone of Palaeo River Courses in Thar desert", said the surface geophysical surveys conducted in the Tanot-Ranau-Sadewala region of Jaisalmer district revealed significant supporting evidence of the presence of the river.

They had found a "thick fresh water aquifer" beneath the inter-dunal depressions and the presence of a thick permeable unsaturated zone of fine sand under the dry sand dunes.

"The 30 to 45 metre thick highly permeable unsaturated zone of fine sands in the palaeo course has great capacity to accept, hold and recharge ground water," they said.

Interpretation of landsat-imagery of the western part of Rajasthan had revealed the buried course of the river running from north east to south west.

This course has links with the dry bed to the Ghaggar river the north-east (Ganganagar district) while in the south-west it met or cut across the surviving course of the Hakra and Nara rivers in Pakistan.

The experts said development of ground water reserves in the region would depend on proper identification of the palaeo course of the Saraswati, which at places held fresh water aquifers.

In contrast to the western parts of the State, the north-eastern region falling under the command area of the Indira Gandhi Canal project was experiencing "alarming water logging", the paper noted. The ground water monitoring data had shown an average rise of water level as 0.8 m per year in project stage one and 0.44 m in stage two. One of the main causes for water logging was indicated to be the absence of a "natural drainage outlet", the experts said.

Interpretation of satellite imagery data indicated the existence of an integrated natural network of palaeo-drainage under the sand dune. "The general groundwater flow being north-east to south-west, the drainage network can be revived and used for recharging the permeable unsaturated zone by draining water-logged, areas with appropriate slopes," the experts suggested. Recharging the unsaturated zone above the palaeo course in Tanot-Ranau area may be initiated on an experimental basis with the Indira Gandhi Canal water passing near Ramgarh, about 25 km south of the area, they added. Mr. Chandra and Mr. Chaturvedi felt that though it might not be possible to "re-green" the desert and bring back prosperity in thinkable time scale, an attempt could definitely be initiated without delay.

(The Hindu, 5/07/2000)

(Ground Water Hydrology, Rajasthan (Thar desert), Saraswati river)

IE(27) To Conserve Water, Start with Land

The current water shortage in a significant part of India should prompt us to consider where we have gone wrong and what needs to be done to ensure that there is no scarcity of this most basic of all needs.

Water Planning for a cluster of villages and hamlets included in a watershed should be based on establishing a harmony between availability and present needs, on the one hand, and future needs, on the other hand. In the case of present use, the first priority is drinking water for human beings as well as all other forms of life, including farm/domestic animals as well as wildlife. The second, is other domestic uses. The third- agriculture, fourth- industrial and recreational uses. The practical manifestation of such prioritisation is that if an industrial project comes up which has substantial water requirements, then the first question that will be asked is – do we have enough for the first three priorities? If the answer is no, then the industrial projects should not be allowed to come up in that area. On the other hand, if spare water is available for industrial use, then its limits should be clearly laid down in such a way that the priority uses are not affected.

Coming to the third category of agriculture use, a question that needs to be raised is whether the existing cropping pattern is in keeping with local water availability.

Scarcity is created not just by overexploitation but also by the pollution of water. While industrial wastes have generally been regarded as poisonous, chemical pesticides are also emerging as an increasingly important cause of such pollution. Urban authorities frequently fail to meet the basic norms of treating sewage properly before dumping it into rivers. Here again, the question of political will looms large.

On the supply side, first we should take well care of the tanks and traditional wells that already exist. In many places as soon as handpumps and tubewells become available, the tanks and traditional wells are neglected. The additional possibility of conserving more water by constructing more check dams, check-wells, tanks and various traditional water conservation structure suited to local condition should also be included as a top priority in development programmes.

(Indian Express, 03/07/2000, Bharat Dogra)
(Water Conservation, General)

June,2000

H(38) DDA Proposal For Water Harvesting

Sensing the need to conserve water, the Delhi Development Authority (DDA) has proposed amendments to building by-laws making it mandatory for city buildings to have in-built provisions for water conservation, rain water harvesting and energy conservation.

The proposals, if accepted, would necessitate build-ups over 250 sq.mt. to have provision for rain water harvesting, dual water supply system, limiting flushing equipment capacity to five litres, installation of waste water recycling plants and conservation of energy through passive climate control.

Prepared after much deliberation, past experiences and those of other world cities, the DDA would soon be submitting these to the Municipal

Corporation of Delhi and the Delhi Jal Board for incorporating them with building by-laws.

It is necessary to create a large self-sustaining eco-system by making water conservation measures and rain water harvesting a must for any large-scale development in the Capital, asserted the DDA Member (Engineer), Mr. R K Bhandari. Incorporation of these provisions in building by-laws is expected to contribute towards arresting the depleting underground water reserve levels.

The proposal makes it compulsory for building plans to indicate clearly the storm water system and the methods employed to harness rain water. It has to be collected in all terraces, roads, parking areas and other hard paved surface of the development site.

According to Mr. Bhandari, due to massive concretisation, ground surface has been cemented with hard and impervious material. As a result, rainfall usually runs off and is disposed off in locations far removed from the main areas.

The proposal calls for installation of dual water supply system in buildings. While the potable water supply system, to be installed in the kitchen, would be used for drinking and cooking purposes, those for domestic supply system would be installed in toilets, water coolers for desert coolers, gardens, roads, paved areas and washing.

With this, officials argued, the demand of potable water would reduce substantially. And for domestic use, waste supply could be ensured from the harvested rain water or from other sources with minor treatment.

For any future construction, the proposed amendments call for limiting the volume of all flushing cisterns to five litres. Only those sanitary fixtures and fittings with such low capacity cisterns would be permitted. All faucets shall be provided with aerators to reduce consumption. All building complexes with a waste water discharge capacity of over 10,000 litres shall incorporate a "gray water" system and install waste water recycling plants of an electro-mechanical type or a constructed wetland type, it said.

Water treated would be used inside the campus horticulture, cooling towers and even flushing, depending on its quality. "All the submitted plans would have to clearly identify the type of system proposed along with details of the process."

Strongly arguing for encouraging energy conservation in the form of "passive climate control", the DDA has proposed that all buildings should be provided with thermal insulation on the external west and south walls and roofs.

And finally, where feasible building orientation shall be made to obtain maximum use of natural light and ventilation, with minimum heat gain in summer as an additional energy conservation measure, the DDA has proposed.

The DDA has argued that these additions in the building by-laws are made mandatory for all new buildings of non-residential nature, group housing societies and residential plots over 275 square metre.

(The Hindu, 29/06/2000, DDA)

(Urban Hydrology/ Water Harvesting, New Delhi)

H(39) Need to Manage Water Resources

The Union Minister for Water Resources, Mr. Arjun Charan Sethi, has stressed the need for building up a suitable legislative and institutional framework for ensuring proper water management in the country. A series of measures were required for water management in the States like Rajasthan to overcome

the present scarcity of water, the Union Minister for Water Resources, Mr. Arjun Charan Sethi said.

Inaugurating a two-day national seminar on ground water management strategies in arid and semi-arid regions in the B.M. Birla Auditorium here on Friday, Mr. Sethi said the indiscriminate and unregulated use of water had let to the depletion in ground water level and it had reached a state of crisis.

Against the desirable per capita annual availability of 1,850 cubic metres of water in the country, the current availability is only 1,700 cubic metres; and taking into account the population growth, the availability would fall to about 1,450 cubic metres by 2025. The Minister pointed out that the time had come to squarely focus on the issue of proper management of water resources so as to ensure availability in a sustained manner.

He said the Central Ground Water Board had carried out extensive artificial recharge studies in many States and they had let to the development of area specific techniques which had demonstrated a high degree of efficiency in the collection of rain water and recharge of ground water.

Mr. Sethi favoured the introduction of rooftop rain water harvesting for improving the drinking water availability in towns and cities. He also emphasised that people's participation was essential in the water management sector.

The Union Minister of State for Rural Development, Mr. Subhash Maharia; said while the Government efforts were necessary for optimum utilisation of water, people must be made aware of the significance of water through the "Gramodaya" programmes.

Noted activist, Mr. Anna Hazare, speaking on the occasion, said the absence of people's initiative in water management had led to the Government taking over the work and added that the technical flaws in official schemes often rendered them ineffective. He called upon the Gram Sabhas to take up the conservation and management of water as a major component of their work.

Scientists and experts participating in the conference include those from the Rajiv Gandhi Drinking Water Mission, NABARD, Central Ground Water Board, Indian Institute for Rural Development, UNICEF, Central Arid Zone Research Institute and the Indian Space Research Organization.

(The Hindu, 25/06/2000)

(Ground Water Hydrology/ Water Management, Rajasthan)

H(40) FACT FILE : India and the Worlds' Freshwater

Europe & Central Asia, Latin America & Caribbean and Canada are endowed with plentiful supply of fresh water resources. The per capita availability in South Asia is twice that of Sub-Saharan Africa. As much as 87 percent of the annual freshwater supplies in low income countries is consumed in agriculture while the middle income countries use three-fourths of available water. On the other hand, the high income nations use 59 per cent of their water resources for industry and 30 per cent for agriculture. The use of freshwater for domestic purposes is relatively small, particularly in low income countries .

Among individual countries, the Congo Republic has a huge per capita availability of nearly 3 lakh cubic metres. Papua New Guinea has three times the per capita availability of Paraguay. Canada and Norway also have sizeable volumes of fresh water. The right hand side of Chart II shows that the urban population of most countries had better access to safe water than the rural segment.

Access to safe water in Canada and Norway is 100 per cent, that is the whole population. Panama too has near cent per cent access to fresh water. In India the urban population has greater access to safe water than the rural population.

(The Hindu, 12/06/2000)
(Potable Water/ Water availability, General)

H(41) A Unique Irrigation to Check Drought

In a unique initiative, the Mahi Bajaj Sagar Project here – hit hard by the paucity of funds and scarcity of water during the current spell of drought – has embarked upon "participatory irrigation management" to benefit the predominantly tribal population inhabiting the command area in Banswara district.

The Mahi dam, 16 km from Banswara town has witnessed the lowest-ever inflow of water this year with its reservoir filled up to 10 metres less than its capacity level of 280.75 metres. With the carryover storage, the water availability exclusively for irrigation stood at only 50 per cent of what it was during the past couple of years.

The dam has been built on the Mahi river originating in the Dhar region in Madhya Pradesh and is capable of irrigating 1.23 lakh hectares. Significantly, more than half of Banswara district falls in the Mahi dam command area, being fully or partially irrigated by the Mahi canals.

In view of lesser availability of water, its use for power generation by the two hydel power plants at the dam has been stopped. However, the challenge at the onset of summer this year was to ensure optimum use of the available waters for irrigation.

The dam authorities chalked out a plan to first change the cropping pattern and ten supply water in accordance with the requirement of volume land time in the present command area of 80,000 hectares. The water scheduling plan was probably the first scientific exercise in the country aimed at evolving a healthy crop-water relationship, according to the Chief Engineer of the Mahi Bajaj Sagar Project, Mr. R K Gupta.

He told the Hindu that scheduling was planned with a margin of 20 per cent surplus water looking to the existing irrigation practices of the command community. Besides, it had a provision for supply of water for extra time to serve the tail areas connected with the Mahi canals.

Following a close examination of the condition of canals, it was found that they needed desilting and extensive repairs. Mr. Gupta said the task of desilting was taken up at this time of the year annually with an expenditure of about Rs.35 lakhs. This was not possible this year because of a 30 per cent cut in the budget allotted to Mahi Bajaj Sagar, reducing the money from Rs.38 crores to Rs.28 crores. Since the principal objective of the dam authorities this time was to curtail both the establishment costs and expenditure on work execution, several avenues were searched which led to the idea of using the vast potential of farmers. An appeal was issued to the cultivators to do the job of silt clearance themselves, pointing out that it would enable water to reach their fields without any hindrance.

Desilting: After initial resistance, the farmers agreed only when the dam authorities assured that the departmental labourers would help them and supervise in the desilting operations. In the true spirit of participatory irrigation

management, the canals were cleaned jointly; and it was found at the end of irrigation season that hardly one to two per cent of the areas at tails had not received water.

In addition to desilting, a new concept of "barabandhi" was also introduced on the project, in which water was stopped by putting up small mud walls and utilised equally by the farmers from head to tail in every canal. Earlier, the water used to go down the drain during the night and was causing waterlogging at several places.

With less water, irrigation was taken up in 65,116 hectare area this year, leading to 10 per cent increase in crop production and an improvement in the quality of grains.

Mr. Gupta asserted that with its crop-water management, the Mahi Bajaj Sagar was now not only in a position to supplement Kharif crop in the adverse circumstances of rain failure during the coming monsoon, but also had the capacity to supply drinking water for the full year in case of no rains.

(The Hindu, 5/06/2000)

(Dam Hydrology, Rajasthan, Mahi Dam)

H(42) Solutions that Hold Water

In India, hundreds of villages still do not have a single source of potable water. But the rich continue to over-exploit groundwater, sinking tubewells deeper and deeper into the earth to draw out this precious sustenance.

The cycle of drought, poor irrigation facilities and bad management of water resources became a nightmare this year in Gujarat, Rajasthan and Andhra Pradesh. In cities, fights over water have intensified and mass migration of man and cattle has begun in several areas.

But if people begin conserving water, particularly rainwater, this periodic water crisis can be averted. According to Dr. D K Chadha, Chairman of the Central Ground Water Board (CGWB), some 210 billion cubic metres of rainwater that is lost as runoff can be stored underground and 160 billion cubic metres of this water utilised. Dr. Chadha hopes that the board and hydrologists can tap the new found enthusiasm for water harvesting all over the country.

Model experimental studies on water harvesting are being conducted through 38 projects in 14 States. The Prime Minister will be flagging off this new drive for water harvesting by inaugurating a rooftop water harvesting structure on Shram Shakti Bhavan in the heart of New Delhi.

Rooftop rainwater can be used to recharge groundwater through the use of abandoned dug wells, abandoned or running hand pumps, recharge pits and recharge shafts. Before using a dug well as a recharge structure, its base should be cleaned and all deposits removed. Dug wells are recommended for buildings that have a roof area of 1,000 sq.metres. If a building has a roof area of just 100 sq.m., the recharge structure would be a pit. For a building with a roof area of 200 to 300 sq.m., the recharge structure is a trench – 0.5 to a metre wide, 1 to 1.5 m deep and 10 to 20 m long depending on the availability of land.

In the National Capital Region, the CGWB has taken up two artificial recharge schemes in two different hydrogeological regions. While in one the recharge was done through check dams, in the other, roof top rainwater harvesting was done to recharge groundwater through a tube well and a dug well. In Kerala to harness groundwater that was flowing out from nallas, sub surface dykes were constructed.

The Centre for Science and Environment maintains that every village in India can meet its basic drinking water and cooking needs through water harvesting. It takes just 100 milli-litres to cultivate 1.2 hectares of land, says Anil Agarwal of CSE.

The farmers of Khopala were emulating the water shed development model for Rajsamadhiala village in the neighbouring Rajkot district. The latter had in turn looked to Anna Hazare's Ralegaon Siddhi in Maharashtra. In Alwar district of Rajasthan, farmers under the guidance of Tarun Bharat Sangh, have rebuilt their old and crumbling water harvesting check dams and revived a dead river. Now prosperity has returned to Alwar district.

While non-government organisations have been in the vanguard of the peoples' movement for recharging dried water sources with check dams and watershed development, there are some government departments and officials who have taken the initiative for watershed development.

Neither 2.85 million sq.km. of the desert area nor the 500,000 sq.km. of the hard rock Deccan area have not been properly explored for sub-strata water. In fact there is not a single scientific institute to explore water sources in desert areas. Atleast people have to be trained as hydrogeologists so that they can fan out across the country and help people recharge ground water. Though the CGWB has been advocating recharging of groundwater for 20 years, people prefer to use tube wells for extracting water without bothering to recharge it.

With groundwater levels falling drastically all over – in Delhi by four to 10 metres in the last 10 years – there is talk of a groundwater recharge consultancy service being set up in Faridabad. In the Najafgarh and Mehrauli areas of Delhi, a ban has been imposed on construction of any new tube well. Any well drilled will be capped and the drilling company prosecuted. The Delhi Government is contemplating making rain water harvesting mandatory for new housing societies.

(The Hindu, 04/ 06/ 2000, Usha Rai)
(Water Harvesting, New Delhi)

IE(28) 11,000 Villages in U.P.Hills face Drinking Water Crisis

After the Drought in Gujarat and Rajasthan, now it is the turn of the Himalayan region, when provides water to the entire sub-continent through its river systems, to face severe water crisis. More than 11,000 villages in Uttarakhand and Kumoan hills, out of a total of more than 15,000 villages, are deficient in the availability of drinking water. In the summer, the situation gets worsened as women folk of the hill villages had to trek miles to get a bucket of water.

Not only in Uttarakhand region but in Himachal Pradesh and Jammu and Kashmir, the problem of shortage of drinking water has reached gigantic proportions. While the Jammu region had been suffering from drinking water shortages for long, the Kashmir valley faced the worse-ever water crisis in the last summers. All these problems of water shortages faced by the participants from these hill states at a two day workshop organised by the Himalayan Environmental Studies and Conservation Organisation (HESCO) here. The aim of the workshop was to highlight the problem of water scarcity in the Himalayan region for both drinking as well as irrigation purposes despite the fact that all the major river systems originate from the hills. Dr. B.K.Joshi said that crores of

rupees were being wasted every year on water supply schemes in the hills that become defunct from the very beginning.

Dr. Anil Joshi, founder of HESCO and profounder of water movement in the Himalayan region said that the National Water Policy (NWP) document has nothing to offer to the people of the hills. He said that the draft Water Policy document has dismissed the demands and aspirations of the people of the hills in a very casual manner despite the fact that the region has been facing acute water crisis.

He said that he intended to represent against the provisions of the National Water Policy to the government and also to educate the hill people about their precious water resources on which they have every right.

(Indian Express, 03/06/2000, S.M.A.Kazmi)
(Water Policy/ Water Crisis, Uttar Pradesh)

IE(29) Gujarat Over-Exploiting Water

The Central Ground Water Board (CGWB) has written a letter to the state government asking it to initiate urgent measures to control and regulate the " over-exploitation" of ground water in certain parts of the state, particularly north Gujarat, but the government is unwilling. Confirming this , Water Supply Minister Narottam Patel that the government had received a letter from the CGWB, but asserted," We will resist any move by the board to impose a ban on the use of ground water, till viable alternative is provided by it.

Minister of Medium and Minor irrigation projects Nitin Patel argued, " Water is a state subject and no one on the earth can prevent the people of Gujarat from drawing ground water either for agriculture or drinking purposes." He said that the government is not in a position, at this juncture, to stop farmers from exploiting ground water without providing an alternative source, and without implementing water recharge projects in the affected districts.

Nitin Patel admitted that new borewells were being sunk in Saurashtra and north Gujarat in view of the current water shortage. He also said that the government was also worried over the depleting water table in as many as 31 talukas, spread over 17 districts. Of these talukas, identified as 'over-exploited', 15 are in north Gujarat, with Mehsana being the worst-affected district, with all nine talukas in the OE category.

But it's a matter of time. As soon as the Narmada water start flowing through the north Gujarat region, the problem will ease considerably. The Sardar Sarovar Project will irrigate 17,92 lakh hectares, of which about 1.5 lakh hectares is in Mehsana", the minister said.

(Indian Express, 03/06/2000, Bashir Pathan)
(Ground Water Hydrology, Gujarat)

IE(30) Villagers Solve their Water Problems

Just three months ago, in March, most baodis (village ponds) and hand-pumps in this drought-hit tribal district of Madhya Pradesh were dry. Instead of turning to the authorities for help, villagers took an oath: " We will solve our summer water problem ourselves."

Within a span of three months, they have redeemed their pledge. " By formulating and executive drinking water microplans for each of the 1,487 villages on their own. The community effort involved deepening 596 baodies and

digging wells through voluntary labour. In 655 villages, pumped water supply schemes were restarted by placing pumps lent by affluent villagers in existing as well as fresh borewells. The villagers even worked out a plan for self-policing through women's water watch committees'. Illegal connections were disconnected and the recovered electricity arrears used to restart closed pumped-water supply schemes. Every important decision- from preparation of plans to their execution and financial control – was taken by the villagers.

For instance, when the Dedla Panchayat met on March 20 to formulate its village drinking water plan, it found only four of the 15 handpumps working. The water being supplied through pumps to parts of the village had got reduced to a trickle. While the villagers agreed to desilt and deepen existing baodis and erect check dams on the nearby Bagedi river as a long-term solution, the summer drinking problem required immediate solution. Many people from different village, worked without wages to build a road, borewells, handpumps, to make it possible. They even raised Rs.1.52 crore by way of public contribution to supplement the Rs.6.06 crore received under the Jawahar Gram Samridhi Yojana and State Finance Commission for civic works. This work was done in record time.

(Indian Express, 01/06/2000, Yogesh Vajpeyi)
(Water Availability, Madhya Pradesh)

May.2000

H(43) Rajasthan to try out water harvesting

The Rajasthan Government proposes to introduce water harvesting techniques similar to that of Ralgaon Siddi to find a permanent solution to the recurring drought conditions in the State.

After a meeting with the noted social worker, Mr. Anna Hazare, the proponent of the Ralgaon Siddi experiment here, the Chief Minister, Mr. Ashok Gehlot, today announced that at least one village in each of the 230-odd panchayat samitis in Rajasthan would have a project for water conservation adopting the methods tried out successfully in the Maharashtrian village.

The Chief Minister, members of his Council of Ministers and senior bureaucrats listened to Anna Hazare detailing the need for going back to Gandhian methods to bring self-sufficiency to Indian villages. A team of five senior officials from the State led by the Agriculture Secretary who recently visited Ralgaon Siddi on a study also attended the meeting.

Citing the Ralgaon Siddi example, Mr. Hazare said water conservation and development were interlinked. A check on unlimited exploitation of water and other natural resources was needed. From a village, which had no drinking water, Ralgaon Siddi now takes two crops and exports vegetables outside. The returns from the sale of milk alone amounted to Rs.60-65 lakhs annually, he revealed.

Mr. Hazare said many persons from Andhra Pradesh, Madhya Pradesh and Karnataka had successfully adopted the methods of rural development tried out in Ralgaon Siddhi. Rajasthan had to develop its own plans to get rid of the "bloat of being a drought-prone area" forever, he said.

Mr. Gehlot said the recurring droughts in the past proved a major obstacle in the State's development. As the whole machinery got busy with drought relief

operations, the development process got slowed down. The State would hereafter strive to conserve water in villages to stop it from flowing out or getting lost through evaporation, he said.

The Chief Secretary, Mr. Inderjeet Khanna, said an action plan would be soon made for water harvesting in villages on the basis of the observations of the study team, which went to Ralgaon Siddi.

(The Hindu, 31/05/2000)
(Water Harvesting, Rajasthan)

H(44) A unique effort to conserve water

Finding the government measures to conserve water inadequate, a village community took it upon themselves to develop the requisite technique and proved successful.

At first sight, the zigzag pattern of rectangular enclosures, a small gradient enveloped by trees on dykes on three sides bordering the pasture land in this remote village in Rajasthan does not seem to be an innovation, or the greenery anything extraordinary. But government records of the 1970s put Laporia as a village of 189 families in a drought-prone area characterised by barren, saline soil, denuded pasture lands and starving livestock.

This involves "chaukas", or rectangular enclosures, for storing rainwater in dyked pastures, Mr. Singh formed a non-governmental organisation called "Gram Vikas Nav Yuvak Vikas Mandal"(GVNYM) in 1990. He mobilised the village community to undertake the revival of its ecology. "The chaukas, each being 200 foot long and 400 foot wide, spread shallow water over a larger area than trenches which promote the growth of grass. The chaukas have been built in such a way that excess water from one enclosure flows into the next. Andy they also play an important role in recharging groundwater," explained Mr. Singh, a postgraduate in social work from Rajasthan University.

The chauka is divided into two equal rectangles. Dykes of about 1.5 metre in height are built along three sides on the periphery of gradient. Trees are planted on these to give them additional support.

All the rainfwater is collected towards the lower half of the chauka that is dyked. As the amount of the water stored rises, it flows into the neighbouring chauka and so on. After reaching the last chauka, excess water flows into a monsoon drain. "In 1994, work was initiated on just 50 hectares of pastures to integrate the degraded land into a single protected unit. To build the dykes, the residents volunteered to work as shramdaan", Kalu Dada, a village elder who played an important part, said. The scheme covers the entire pasture land of the village.

To prevent cutting of trees, Laxman Singh, on behalf of the association, circulated a notice in 1991 stating that any person who cuts a tree has to plant another and render a written apology. A fine of 5 kg of grain for every tree cut was also instituted.

Now years after, the villagers are feasting on the green environs of "gochar bhumi" (pastureland). The 'ana sagar', the old water tank of the village restored in 1994, shimmers. The percolation tanks that provides drinking water to the 3000-odd inhabitants have been named Dev Sagar and Phool Sagar.

Though Laxman Singh has bagged many awards including the fellowship of Ashoka, a prestigious international NGO award for making a difference in society, the Government is yet to recognize the method.

"Many an elder from neighbouring villages, faced with the same problem, come to us for consultation. But the Government says it can formally accept it for promotion only when it will be tested and approved by scientific institutions" Mr. Singh said.
(The Hindu, 31/05/2000)
(Water Conservation, Rajasthan)

IE(31) Crores of Litres of Water go Waste as Officials Look the Other Way

The leaking tank is not just about the loss of water. It's a huge waste of power since pumps with capacities between 17 hp and 40 hp have been working endlessly to fill the tank that provides water to 10,000 people in five wards of the town. The figures in this conservative estimate would put the Guinness book of World Records to shame but not the scores of officials and public representatives who have casually passed by this sight of unpardonable neglect.

Installed in 1951 at a cost of Rs.1 lakh to store 2,60,000 lakh litres of water, the tank made of steel functioned well till 1970 when it developed a breach at the bottom. Since then, no one has bothered to plug the leak. For the past 10 years, the breach has become bigger and bigger. Now it has become a bathing place for stray animals and a free washing facility for scores of motorists. Authorities says, " Nobody has ever tried to look into the problem seriously. Since water is available in abundance here due to the adjacent Wardha River.

The water passes out through an open drainage and has created a huge marshland. Part of the water flows along with the town's drain water in the form of a stream, which travels 7 km. To merge with the Wardha river. The tank is in such a bad shape that the cost of repair would be more than the cost of having a new one.
(Indian Express, 29/05/2001, Vivek Deshpande)
(Water Management, Maharashtra, Wardha river)

H(45) 'Sewage, water mixing led to death of beggar'

The Municipal Commissioner, Mr. S P Aggarwal, today said mixing of sewage with underground water - used for drinking by the inmates of the Beggars' Home at Lampur in Narela - had led to the outbreak of gastro-enteritis, resulting in the death of six inmates earlier this month.

The Municipal Corporation of Delhi (MCD) has also shot off a letter to the Department of Social Welfare, after its senior officers visited the spot on May 16, asking it to get the water pipelines checked by the Central Public Works Department to ensure there is no mixing of drinking water with sewage. The letter also underlined the urgent need to repair the chlorinator, cleaning of septic tanks and provision of pure drinking water to the inmates.
(The Hindu, 23/05/2000)
(Water Pollution/ Potable Water, New Delhi)

H(46) Harvest Rainwater, says PM

"Capture rain water, store it and use it - it is as simple as that," the Prime Minister said. He called for a nation-wide debate on excessive and indiscriminate exploitation of groundwater, which has resulted in an alarming fall in the water table in many parts of the country. The situation called for nothing

short of a people's movement, with the active participation of governments, panchayats, NGO's, businesses and co-operative societies and each and every citizen. Later, in a personal meeting, the social worker, Mr. Anna Hazare, urged Mr. Vajpayee to adopt rainwater harvesting and localised water management "as a policy".

"No single initiative is adequate to solving the problem of drinking water. We necessarily have to follow diverse routes and a plurality of programmes to achieve our objective. But, amongst all of them, the one idea that stands out for simplicity, efficacy and affordability is rainwater harvesting", the Prime Minister said.

If water was not conserved the very natural life cycle on the planet would be endangered. "It is estimated that water in the 21st century is going to be as precious a resource as oil was in the 20th century. Today one billion people in the world - one sixth of humanity - have inadequate access to clean and sufficient water. Unless the problem is tackled, this number would rise to 2.5 billion - nearly one person in three. It is disquieting to know that most of these people would be in India. This means not only under-development of the economy and society but also social unrest".

Making an appeal for declaration of the next decade as 'Water Decade', the Minister for Water Resources, Mr. C P Thakur, said a central groundwater study shows that it shall be possible to capture 214 bcm (billion cubic metres) of rainwater during the monsoon and recharge aquifers. A study by the Centre for Science and Environment says that one percent of the land in the country may have to be utilised if the entire water requirement was to be met by harvesting rainwater and storing it underground.

Mr. Thakur said his Ministry had launched a Rs.25 crore scheme for creating demonstration facilities for artificial recharge. One such structure was inaugurated today at the Shram Shakti Bhavan office of the Water Resources Ministry. The Minister of State for Water Resources, Mrs. Bijoya Chakravorty, bemoaned that "we think of water when we do not have it". She sought a legislation on making rainwater harvesting a people's movement.

(The Hindu, 23/05/2000, Seminar)
(Water Harvesting, General)

IE(32) Water: PM says India may be worst off in 25 yrs.

Sounding a warning to not just government but the people at large, Prime Minister Atal Bihari Vajpayee today said that India could be the country with the largest number of water- deprived people in the next 25 years if we did not manage our water resources judiciously. Unless government and communities themselves tackle this problem seriously, around 2.5 billion people world-wide would not have access to enough potable water in the next two to three decades – up from the present figure of one billion, the Prime Minister said.

Inaugurating a seminar on Rain Water Harvesting, he said that water shortage not only denoted under – development of the economy and society but can also trigger social unrest.

India, with its billion – strong population, would be especially vulnerable to this water crisis if water resources continued to be mismanaged, he warned.

Vajpayee said that effective solution to this problem did not rest exclusively with good policies of governments. What was of paramount importance was the people's attitude and habits. " If we continue to treat water as

a free or cheap resource that can be wasted, not even the best policies and technologies can help," he warned.

Referring to participation as a major source in bridging the gap between the demand and supply of water, he said that India received 4,000 billion cubic meters (bcm) of water through annual precipitation. Of this, only about 750 bcm was being used. He added, Diverse routes and a plurality of programmes were need to achieve the objective.

(Indian Express, 23/05/2000 ,Seminar)
(Water Harvesting, General)

H(47) Raw Water Trickles Down To Nangloi Plant

Delhi's long wait for water has ended. The desperately needed 125 cusecs of raw water from the Bhakra Beas Management Board (BBMB) arrived today. And the Chief Minister, Ms. Sheila Dixit, along with her Cabinet colleagues, was there to witness the raw water trickle into the Nangloi Water Treatment Plant in West Delhi.

The raw water was brought through the Western Yamuna Canal System, Bawana, at 20 km from the Nangloi Water Treatment Plant. With this, the Rs.70 crore Nangloi plant, which had been hanging fire for past 17 months, also became operationalised.

However, following consultations between officials of the Delhi and Haryana Governments and the Water Resources Ministry and after the Supreme Court's intervention on May 10, the deadlock was broken. Haryana has agreed to the use of its channel for allowing Delhi to tranship the 125 cusecs it has purchased from BBMB last year. The Chief Minister said the water supplied through the treatment plant would benefit about 10 lakh people directly in rural, West, Southwest parts of Delhi. The 1,200 mm dia main would supply water to Dwarka, being developed by the DDA, Uttam Nagar group of colonies and part of West Delhi.

Nangloi and adjoining areas would be supplied through the 900 mm dia water main, while Mundka village and other rural and urban areas along Rohtak Road would be supplied through 600 mm dia main having a length of 1.6 km and the Najafgarh and adjoining areas would be supplied through 1,000 mm dia having a length of 12 km.

Around five lakh persons in South Delhi under the command of Deer Park underground reservoir shall be indirectly benefited as seven MGD of water would be diverted to them from the Haiderpur Plant.

According to official figures, Delhi's total demand stood at 750 MGD while the supply was only 600 MGD. Added to this the 17 percent loss due to leakages and faulty pipes, the deficit adds up to a substantial 270 MGD. In effect, one-third of Delhi's population does not get drinking water from the DJB.

Moreover, 30 percent of the population living in the 1,071 unauthorised colonies, 600 JJ clusters and large number of villages depend on hand pumps and tubewells and the rest on rivers and canals which are not fit for consumption.

(The Hindu - 23/05/2000)
(Water Treatment Plant / Potable water, New Delhi)

short of a people's movement, with the active participation of governments, panchayats, NGO's, businesses and co-operative societies and each and every citizen. Later, in a personal meeting, the social worker, Mr. Anna Hazare, urged Mr. Vajpayee to adopt rainwater harvesting and localised water management "as a policy".

"No single initiative is adequate to solving the problem of drinking water. We necessarily have to follow diverse routes and a plurality of programmes to achieve our objective. But, amongst all of them, the one idea that stands out for simplicity, efficacy and affordability is rainwater harvesting", the Prime Minister said.

If water was not conserved the very natural life cycle on the planet would be endangered. "It is estimated that water in the 21st century is going to be as precious a resource as oil was in the 20th century. Today one billion people in the world - one sixth of humanity - have inadequate access to clean and sufficient water. Unless the problem is tackled, this number would rise to 2.5 billion - nearly one person in three. It is disquieting to know that most of these people would be in India. This means not only under-development of the economy and society but also social unrest".

Making an appeal for declaration of the next decade as 'Water Decade', the Minister for Water Resources, Mr. C P Thakur, said a central groundwater study shows that it shall be possible to capture 214 bcm (billion cubic metres) of rainwater during the monsoon and recharge aquifers. A study by the Centre for Science and Environment says that one percent of the land in the country may have to be utilised if the entire water requirement was to be met by harvesting rainwater and storing it underground.

Mr. Thakur said his Ministry had launched a Rs.25 crore scheme for creating demonstration facilities for artificial recharge. One such structure was inaugurated today at the Shram Shakti Bhavan office of the Water Resources Ministry. The Minister of State for Water Resources, Mrs. Bijoya Chakravorty, bemoaned that "we think of water when we do not have it". She sought a legislation on making rainwater harvesting a people's movement.

(The Hindu, 23/05/2000, Seminar)
(Water Harvesting, Genaral)

IE(32) Water: PM says India may be worst off in 25 yrs.

Sounding a warning to not just government but the people at large, Prime Minister Atal Bihari Vajpayee today said that India could be the country with the largest number of water- deprived people in the next 25 years if we did not manage our water resources judiciously. Unless government and communities themselves tackle this problem seriously, around 2.5 billion people world-wide would not have access to enough potable water in the next two to three decades – up from the present figure of one billion, the Prime Minister said.

Inaugurating a seminar on Rain Water Harvesting, he said that water shortage not only denoted under – development of the economy and society but can also trigger social unrest.

India, with its billion – strong population, would be especially vulnerable to this water crisis if water resources continued to be mismanaged, he warned.

Vajpayee said that effective solution to this problem did not rest exclusively with good policies of governments. What was of paramount importance was the people's attitude and habits. " If we continue to treat water as

a free or cheap resource that can be wasted, not even the best policies and technologies can help," he warned.

Referring to participation as a major source in bridging the gap between the demand and supply of water, he said that India received 4,000 billion cubic meters (bcm) of water through annual precipitation. Of this, only about 750 bcm was being used. He added, Diverse routes and a plurality of programmes were need to achieve the objective.

(Indian Express, 23/05/2000 ,Seminar)
(Water Harvesting, General)

H(47) Raw Water Trickles Down To Nangloi Plant

Delhi's long wait for water has ended. The desperately needed 125 cusecs of raw water from the Bhakra Beas Management Board (BBMB) arrived today. And the Chief Minister, Ms. Sheila Dixit, along with her Cabinet colleagues, was there to witness the raw water trickle into the Nangloi Water Treatment Plant in West Delhi.

The raw water was brought through the Western Yamuna Canal System, Bawana, at 20 km from the Nangloi Water Treatment Plant. With this, the Rs.70 crore Nangloi plant, which had been hanging fire for past 17 months, also became operationalised.

However, following consultations between officials of the Delhi and Haryana Governments and the Water Resources Ministry and after the Supreme Court's intervention on May 10, the deadlock was broken. Haryana has agreed to the use of its channel for allowing Delhi to tranship the 125 cusecs it has purchased from BBMB last year. The Chief Minister said the water supplied through the treatment plant would benefit about 10 lakh people directly in rural, West, Southwest parts of Delhi. The 1,200 mm dia main would supply water to Dwarka, being developed by the DDA, Uttam Nagar group of colonies and part of West Delhi.

Nangloi and adjoining areas would be supplied through the 900 mm dia water main, while Mundka village and other rural and urban areas along Rohtak Road would be supplied through 600 mm dia main having a length of 1.6 km and the Najafgarh and adjoining areas would be supplied through 1,000 mm dia having a length of 12 km.

Around five lakh persons in South Delhi under the command of Deer Park underground reservoir shall be indirectly benefited as seven MGD of water would be diverted to them from the Haiderpur Plant.

According to official figures, Delhi's total demand stood at 750 MGD while the supply was only 600 MGD. Added to this the 17 percent loss due to leakages and faulty pipes, the deficit adds up to a substantial 270 MGD. In effect, one-third of Delhi's population does not get drinking water from the DJB.

Moreover, 30 percent of the population living in the 1,071 unauthorised colonies, 600 JJ clusters and large number of villages depend on hand pumps and tubewells and the rest on rivers and canals which are not fit for consumption.

(The Hindu - 23/05/2000)
(Water Treatment Plant / Potable water, New Delhi)

IE(33) Bhakra-Beas Water to Flow into Capital

The water shortage in West and South Delhi will receive relief early next week with the Bhakra Beas management Authority releasing 125 cusecs of raw water for the capital. A Supreme Court order on May 10, 2000, facilitated the release of the water through the Yamuna Canal system near Bawana.

The additional supply will benefit the 10 lakh residents of West, Northwest and Southwest Delhi as well as rural areas. Lying unused since its construction in 1998, the Nangloi water treatment plant is being readied to receive the water.

Delhi Chief Minister Sheila Dikshit has directed the Delhi Jal Board to gear up to receive the additional water. The Delhi government had made several efforts to augment the use of the Haryana water carrier system to make the 40 MGD water treatment plant at Nangloi operational. The Central Water Commission will monitor the flow of the additional water for Delhi through the canal system and regulate it to guard against any possibility of breach.

(Indian Express, 21/05/2000)

(Water Availability, Delhi, Bhakra-Beas)

H(48) Rs.100-cr. W.B. aid for water harvesting

The World Bank has indicated willingness for a Rs.100 crore assistance for funding drought-proofing measures in the State, particularly water harvesting activities. Mr. Naidu provided global update, the position in the country and in Andhra Pradesh to underscore the need for conservation and judicious use of water. He said only 2.5 per cent of the world's water was fresh, rest was salty. In India, per capita availability of water was down by half in 50 years. In Andhra Pradesh, where the average rainfall was 896 mm, 40 per cent of surface run-off drained into the sea, 35.7 per cent was lost in evaporation; only 14.30 per cent seeped into the ground and 10 per cent available for soil moisture.

It is a pity that in the arid Anantapur district, almost all of its 550 mm rainfall drained off into the se while in Raalegaon Siddhi in Maharashtra where Mr. Anna Hazare launched the watershed movement, water was available at only 16 feet although the rainfall was a mere 450 mm. Kuppam and some other places showcased the success of watershed and other initiatives and emerged as oases in drought prone Rayalaseema.

(The Hindu - 19/05/2000)

(Water Harvesting/Drought Hydrology, Andhra Pradesh)

IE(34) Set Up For Rs.7 Crore, Water Filtration Plant Lies Unused

A water filtration plant, worth 7 crore, set up by the Vadodara Municipal Corporation (VMC) at Nimeta about three years ago, is turning out to be a white elephant.

The filtration plant at Nimeta was constructed by VMC in 1997 to meet the growing demand of drinking water, but three years down the line, the plant is yet to be used for the purpose. The VMC officials admit that they goofed up on assessing future needs and inflow of water from the Ajwa reservoir. Corporation sources say that the old plant at Nimeta was enough to provide filtered water. It is not only the production cost , the VMC is also paying for the maintenance of the plant. VMC sources say the plant is maintained on a fortnightly basis and the cost incurred on this account, including electricity expenses, is almost Rs.60 lakh annually. "There is no adequate water supply from the Ajwa reservoir, so the

filtration plant is lying unused", sources said. The plant has a capacity of filtering 20-25 lakh gallons water but due to inadequate water in the Ajwa reservoir, even this year it would not be operational.
(Indian Express, 19/05/2000, Swati Mazumder)
(Water Treatment Plant/ Water Availability, Gujarat, Ajwa reservoir)

IE(35) 12 Km. From Dam, a town pines for Water

Barely 12 km. From the Kadanna dam, which supplies drinking water to places as far away as Ahmedabad and even water for irrigation to Anand and Kheda, the residents of Santrampur are going thirsty.

Bhamat dismisses arguments that the dam's water cannot be supplied to the Panchmahals due to the region's eneven and rocky topography. " If the people of Rajasthan can be supplied water through canals from Bhakhra-Nangal Dam in Punjab, why can't Santrampur and nearby villages, located a stone's throw away from the Kadana dam, get its water?" they ask.
(Indian Express, 16/05/2000, Syed Khalique Ahmed)
(Water Availability, Gujarat, Kadana Dam)

H(49) Steps for drinking water in drought-hit Kandi

The Jammu and Kashmir Government will undertake urgent measures to augment drinking water and irrigation facilities in the drought hit Kandi areas of the valley.

Initially, 20 hand pumps would be installed within the next 20-days at various places in these areas at a cost of Rs.1 crore, official sources said.

The J & K, Minister of State for Home, Mr. Mushtaq Ahmad Lone, has assured provision of Rs.5 lakhs from his constituency development fund and Rs.18 lakhs out of border area development funds for the exploration of groundwater in Kupwara district, the sources said.

They said Rs.7.55 crores would be incurred on 16 new water supply schemes in Kupwara district under the Centrally- sponsored 10 litre water per capita per day scheme (0-10 lpcd) during the current fiscal year. Eleven water supply schemes have already been completed in the district in the first phase of the programme at a cost of Rs.1.88 crore.

At least 10,000 pump-sets would be provided to the farmers and the Irrigation Department will submit proposals within the next two days indicating the requirements of funds for making exist
(The Hindu, 15/05/2000)
(Potable Water, Jammu and Kashmir)

IE(36) Host of depts, agencies affect Gujarat Water Projects

As many as 11 agencies and government departments in Gujarat have been involved in improving water supply for years, but the situation is going from bad to worse. Overlapping of functions and the maze have stunted the development of various schemes. Some of these agencies and departments function under different ministries and at times, even at cross-purposes.
The Gujarat Water Supply and Sewerage Board's primary job is to arrange for supply of drinking water, Gujarat Water Resources Development Corporation

makes tubewells for irrigation, Gujarat Land Development Corporation is engaged in water-shed management and other micro-level works.

The recently set up Gujarat drinking water infrastructure Company is setting up projects worth 4,700 crore to lay pipeline network to distribute Narmada dam water. This supplements the Sardar Sarover Narmada Nigam Limited, set up specifically for the SSP, and could not possibly be merged with any department.

Salinity is increasing at an alarming rate in Gujarat and there is little the Salinity Ingress Prevention Programme has done about it. By a study by the Gujarat ecology Commission completed in 1997, 18.3% of the state's total area was saline in 1988 and is expected to cross 30% this year. There are 'six' districts under the Dark category, 'five' under Grey and 'eight' under White category. The state'saverage extraction is 75.6%.

(Indian Express, 15/05/2000, Darshan Desai)
(Water Management, Gujarat)

H(50) Groundwater receding, of poor quality.

A survey done by school students of Delhi as part of the Community Led Environment Action Network (CLEAN) - India programme initiated by Development Alternatives, has revealed that ground water in Delhi is receding and is of poor quality.

"The water-monitoring programme has thrown up the alarming observation that the suburbs of Delhi do not receive piped water and therefore, people depend on ground water for all their needs. The ground water in many areas showed levels of fluoride exceeding the permissible limit," the CLEAN-India programme co-ordinator, Ms. G. Maneesha, said here today.

The water monitoring for summer season is an annual exercise undertaken by Development Alternatives with the Clean- Delhi members collecting and analysing water samples from different sites. A major purpose of the exercise is to spread awareness about the quality of water in Delhi and sensitise the people about the need for a cleaner environment.

Ground water of Police Colony, Budh Vihar, Wazirpur Industrial Area, Lawrence Road, Balmiki Basti and Moti Bagh showed nitrate values above 100 mg/1, the DA co-ordinator pointed out. Balmiki Basti, it was revealed during the course of the water monitoring done by Delhi students for Summer 2000, had the high nitrate value of 680 mg/l.

At religious places like the Hanuman Mandir, the ground water showed high value of flouride of 3.2mg/l whereas Birla Mandir, it was further found, it was bacterially contaminated. Over the past few months, it was found that most the hand-pumps from where water samples used to be collected have dried up or have started yielding muddy water. The supply of water in a few areas has also shown presence of Ammonia, bacterial contamination and nitrate value above permissible visits. The supply water of Asia House, K G Marg and Moti Bagh have shown nitrate values above 100 mg/1. Supply water at Moti Bagh had fluoride content of 2.6 mg/1.

During the course of monitoring, the drinking water of a few schools was also found to be of poor quality and the school managements have since then been told to take corrective actions.

(The Hindu , 15/05/2000)
(Water Quality/ Potable water, New Delhi)

H(51) Waiting for the rains

In the case of drinking water also, experts feel there are pockets of scarcity whether in Andhra Pradesh or Rajasthan or Gujarat, which can be supplied from water surplus regions. The Water Resources Secretary, Mr. Z. Hasan, feels that the nation is in such a stage of development that there is no reason to panic. Only, water resources should be conserved wherever available.

There have been no real official scientific studies on the actual use of water for different purposes. However, the projected demand for the various uses in the country, as per the assessment made by the Central Water Commission (CWC) for 2000 is 750 billion cubic meters (bcm). Of this, 630 bcm for 'other' uses.

The Water Resources Ministry puts the usable surface water availability by conventional methods at 690 bcm. A total live storage capacity of 177 bcm had been provided till 1995 through 3,600 large dams and reservoirs and 250 barrages. An additional storage capacity of 75 bcm will be created on completion of the various dams under construction.

The Ministry proposes to construct additional dams to create storage capacity to the tune of 132 bcm. In fact, one of the criticisms against the Ministry if that it goes about pushing mega projects without taking into consideration the socio-economic and environmental impact. The aspect of rehabilitation and resettlement of the project affected people also does not exactly fall under its purview, resulting in lopsided priorities.

However, recently, under the Accelerated Rural Water Supply Programme of the Ministry of Rural Development, there has been a move to promote rainwater harvesting through watershed, artificial recharge of groundwater and roof-top.

(The Hindu, 14/05/2000, Gargi Parsai)
(Water crisis/Water availability, Genaral)

H(52) Where has all the water gone ?

The drought in Rajasthan and Gujarat is a result of skewed priorities, land and water mismanagement and illegal siphoning off of funds and resources. Grand schemes of large dams land canal networks have not delivered what was promised. Rainwater that has been retained by rivers and ponds or seeped into aquifers has been sucked up by cash-cropping farmers, cities and industries.

The rain has fallen on increasingly barren lands, devoid of forests and other vegetation, and run straight off rather than percolate slowly into the ground and recharge wells and tanks. The rain has fallen on water tanks and checkdams that are unable to retain it because they have silted up due to neglect by the governments and communities. All the resources, including money, which should have gone into preventing deforestation, siltation and other forms of land/water mismanagement, have gone into grandiose schemes of big dams and canal networks, which have simply not delivered in proportion to what has been spent on them. Whatever rainwater has been retained by rivers and ponds or seeped into the underground aquifers, has been quickly sucked up by big cash-cropping farmers, cities and industries, leaving very little for small farmers and other rural poor. The current drought is a combination of debilitating centralisation of power, adoption of mega-solutions to micro-problems, neglect of the critical role of forests, and pampering to the ever-increasing demands of large farmers, urbanites and industries.

The concept of water as a "national asset" was used to justify the transfer, as if the local community could not be trusted with "national" property. Disinvested of their customary powers and responsibilities, communities became apathetic to the maintenance of reservoirs and water channels. The increasing politicisation of village panchayats did not help matters. Even in cities, ancient water storage structures, which stood citizens in good stead through countless drought years, suffered neglect due to the centralisation of powers in municipalities.

Finally, it has become clear that it is not the absolute quantity of water that is often lacking, but its skewed distribution amongst consumers. Shamjibai Antala, who has pioneered innovative methods of recharging wells in Saurashtra, says industries in this region draw that 30 crore litres of water a day even during the current drought. The social action group "Disha" has estimated that the Gujarat Government spent over Rs.255 crores on drinking water in 1998-99, yet most of the arid regions of the state are facing serious drought this year. Where, asks Disha, did the money go? Why have the much talked of pipeline schemes for lifting water from the Mahi and the Narmada, which do not require constructing huge and wasteful dams, never materialised ? The answer is simple : the government has siphoned all the money allocated for these and other decentralised projects into the pipedream that is called Sardar Sarovar (Narmada) project. Unmindful of the fact that if the dam, even if it does get built, will provide water to only 10 per cent of Kutch and Saurashtra.

Also instructive is the example of dozens of villages and regions that have withstood the current drought, standing out like oases. This is no quirk of nature. Several hundred villages in Alwar district of Rajasthan are bearing up to the failure of the rains because over the last 15 years their residents, along with the non-government organisation, 'Tarun Bharat Sangh', have built several thousand small checkdams that have recharged wells and underground aquifers, and even brought dying rivers back to life. In Maharashtra, villages like Ralegaon-Siddhi and Manegaon have become famous for having eradicated water scarcity. In Saurashtra, wealthy business folk from Mumbai have pitched in to fund the construction of water harvesting structures; in the same region, the Aga Khan Rural Support Programme has helped villages like Devgadh near Junagadh to drought-proof themselves. In Dewas town of Madhya Pradesh, an enterprising district collector has encouraged roof-top rainwater harvesting, substantially reducing dependence on scarce municipal supplies.

One estimate puts the total amount of money spent on drought relief in Rajasthan, over the period 1956-57 to 1989-90, at Rs.1799 crores. Yet the situation is hardly better. There is little doubt that if this kind of men had been put into decentralised alternatives, into the hands of community institutions, and into long-term drought-proofing measures, the results would have been vastly different. In Kutch, for instance, the Navnirman Abhiyan, consisting of 14 NGOs, has drawn up a plan for Rs.200 crores, to ensure adequate water for the whole district. Without needing the Narmada waters, which would cost several times more, if at all they reached.

It is time that people everywhere learn from the shining examples set by NGOs and sensitive officials, and demand that :

*Governments facilitate the empowerment of communities to harvest and manage water resources, and put its full resources into decentralised structures;

*Cities and industries be forced to harvest their own rainwater and recycle wastewater, rather than mine rural areas;

*All existing forest areas be protected as water catchments, and degraded lands be afforested.
*Perhaps then we will not have to wake up to another rude reminder that it is not nature that has been unkind to us, but our own short-sightedness and skewed priorities.

(The Hindu, 14/05/2000, Ashish Kothari)

(Drought Hydrology/ Water Management, Genaral)

H(53) Need to Devise long-term Drought Policy

The National Alliance of People's Movements (NAPM) has asked the State Governments and the Centre to devise long-term solutions for combating drought conditions in the country. "Drought has become a recurring feature in many parts. The situation is the outcome of bad planning in some areas and lack of planning in certain others", the NAPM leaders told newspersons here at the end of a two-day meeting.

The national convenor of NAPM and "Saver Narmada " activist, Ms. Medha Patkar, the national co-ordinator, Father Thomas Kocherry, national co-ordinator, Mr. Sanjay Mangala Gopal and anti-nuclear activist, Dr. Sandeep Pandey, in a joint press conference said that people participation would be the best way out of the current water crisis. "Planning has to be done to save each drop", Ms. Patkar said.

"At present the whole planning goes against the interests of the people. There is no clear cut policy on water use. There are disparities and discrimination in making water available as 15 percent of the urban people use 25 per cent of the total water", Ms. Patkar pointed out.

According to her, rainwater harvesting should be taken up and unethical practices like drawing limitless quantity of groundwater curbed.

(The Hindu , 12/05/2000)

(Drought Hydrology/ Water Crisis, General)

IE(37) Dwarka Tradition Keeps Water Crisis at Bay – Provision of an underground tank to store rain water is compulsory during construction of houses

It is the centuries –old tradition of water conservation that has given Dwarka reason to rejoice. Almost every house in the city has an underground tank, which is used to collect rainwater every year. Sealed from all sides, the tank has a small opening at the top, through which a bag of lime (which acts as a disinfectant) is dropped into it.

Residents here have water tanks – from stone water cellars to cement plastered ones – for as long as they can remember. Even today, buildings are not planned without the provision for an underground tank. It is this conserved water that has come in handy when Saurashtra has been hit by one of the worst water crisis in a 100 years.

About 98% of houses here have these tanks full of water. All they do is connect drainage pipes from rooftops and terraces to the tank below. Water in these tanks can last upto two years. If the rainfall is good then the big tanks as

15'x15' can collect enough water. Strictly it is used in drinking and cooking. Residents say that we use municipal water for bathing and other purpose only.
(Indian Express, 12/05/2000, Janyala Sreenivas)
(Water Conservation, (Dwarka), Uttar Pradesh)

IE(38) Water Scarcity in India in 25 yrs.: Govt. – Fragile Water Resources under Stress

Water Resources Minister, C.P.Thakur, said in the Lok Sabha today that India was unlikely to face a water scarcity situation at the national level till the end of 2025, though the average annual per capita water availability is estimated to come down from the present 1869 cubic metres to 1350 cubic metres by 2025 due to the ever increasing population.

In a written reply, Thakur said the erratic water availability may cause water scarcity in some parts of the country. India receives about 4000 billion cubic metres (bcm) of rainfall every year of which 1869 bcm appears as average annual run-off in the various rivers of the country. Due to topographical and geographical limitations, only about 690 bcm of surface water can be utilised in addition to 432 bcm of replensible ground water.

Thakur said that over – exploitation of ground water in some parts of the country was leading to a situation of droughts while mismanagement was resulting in floods in other parts. "No doubt India has its finite and fragile water resources which are under great stress due to growing population.

The country's requirement – upto 2025 – can be met through optimal utilisation of the renewable water resources, he said, adding that the government is promoting rain water harvesting through watershed management programme, artificial recharge of groundwater and rooftop rainwater harvesting under the sector reform project of the accelerated rural water supply programme.
(Indian Express, 11/05/2000)
(Water Crisis, General)

IE(39) Water Scarcity in India in 25 yrs.: Govt. – World Bank blames lack of Planning

The world bank today came down heavily on the Central Government for its lack of effective water management and planning, which it says is primarily responsible for the severe water crisis in many parts of the country.

" The present institutional arrangements in India, including Central, State and local institution, do not enable comprehensive water allocation, planning and management," Keith Oblitas, Principal Operation Officer of the World Bank said, while releasing a six-volume report on water resources management of India.

Blaming the present water crisis situation in India on policy pronouncements not getting translated into action, Oblitas said the top-down approach of water management had resulted in major economic, social and environmental cost. Calling for fundamental reforms in this sector, the World Bank said a comprehensive approach was required on capturing water, allocation between sectors and the delivery and management aspects. Water Resources Minister Shri C.P.Thakur said the projected demand for various uses in the country as per the assessment by Central Water Commission was 750 billion cubic metres (bcm) for the year 2000 and the utilisable surface water by conventional methods has been assessed as 690 bcm.

To harness available water resources and augment water supplies, about 3600 large dams and reservoirs and 250 barrages have been constructed and a total live storage capacity of 177 bcm provided by 1995.
(Indian Express, 11/05/2000)
(Water Management, General)

IE(40) Gujarat Pays Price for Water Misuse

Central Ground Water Board discovered a huge reservoir of groundwater spread over 1,500 square km in Kutch about three decades back. Billions of litres of precious drinking water was pumped out of the soil unmindfully. It was used for growing sugarcane, sold by private operators and even used for water sports. Today the region does not even have enough water to drink.

Nature may have been harsh on it, but parched. Gujarat currently speaks of a state, which has been pushed to the brink of disaster due to man-made blunders more than the inadequate rains. The huge pile of records at the CGWB headquarters in the Capital has reports that warn of alarming depletion of the ground water level in Gujarat.

Leave alone the detailed annual reports on the groundwater status, even quarterly accounts of water situation have been reported to the state administration for past decades. Interestingly, with every report the Board made recommendations suggesting means by which the groundwater depletion could be checked and steps required for its enhancement.

In Jaisalmer, around 1970s, the Board detected a huge groundwater aquifer from which 8 lakh litres of water per day could be extracted. But due to over exploitation of the valuable resource, the region has turned dry. D.K.Chadha (Chairman, CGWB) said, same has happened in places like Rajkot and Ahmedabad. In fact, in Mehsana, the groundwater was used for water sports. The current crisis has emerged as the water mafias have taken over the private tubewells and have started selling water.

"So wherever the ground water was easily available and administration did not keep a watch on its extraction, the private operators exploited it to their wish to make money. As a result the water level has depleted to alarming levels," The most dismal part is while extraction was overdone, the recharge activities have been negligible. As a result in places like Mehsana, Ahmedabad, Bhuj and Kutch the water table has fallen by over 4 metres in last two decades. In fact under a UNDP project in 1977 the Board had successfully demonstrated the technology for artificial recharge of deep tubewells under pressure. We made the recommendations to the state government, but there was no action said Member CGWB, " Now Gujarat badly requires a legislation to control the extraction of groundwater.
(Indian Express, 11/05/2000, Davinder Kumar)
(Ground Water Hydrology, Gujarat)

H(54) Looking into Causes for Drought

The drought in Gujarat and Rajasthan has once again focussed the country's attention on water – our most vital resource. However, the crisis has been building up over the past few decades as we have abused and wasted our water endowment, and destroyed the capacity of our ecosystems to conserve water and be resilient to floods and droughts.

The current water crisis has created a national consensus on the value of indigenous water, harvesting technologies and the high cost of having neglected them and allowed them to fall into decay.

But the neglect of water harvesting technologies is not the only cause of the deepening crisis – unless we simultaneously address the other root causes of drought and water famine, droughts will continue to recur.

Deforestation of vulnerable catchments due to logging and mining is an important factor in the creation of droughts and floods. When catchment forests are eroded, or are replaced by industrial monocultures, ecosystems lose their capacity for infiltration and percolation; streams and groundwater sources are not recharged; the rain runs off immediately to cause floods in the monsoons; and in summers dry streams and rivers are left behind.

It is not an accident that the first water conservation movement in India was a forest conservation movement.

The Green Revolution also contributed to drought vulnerability by displacing drought-resistant local varieties, replacing them with 30 seeds which have a high response to chemicals but need three to four times more water than indigenous seeds.

The shift from organic manure to chemical fertilisers has also made our soils vulnerable to drought and desertification.

Organic manuring reduces runoff by 50 per cent. Soil loss can be reduced by six tonnes per ha with six tonnes per ha of organic matter. Organic residues are also food for earthworms and micro-organisms, which increase the water-holding capacity of soils.

The long-term solution to drought therefore lies in water conservation both through water harvesting as well as promotion of sustainable ecological agriculture based on biodiversity which prevents runoff, increased moisture-holding capacity of soils, reduces risks of crop failure and reverses the life-threatening processes of drought and desertification which have already engulfed large areas of our country.

To prevent the waste of scarce water resources through unjust and ecologically destructive practices, the Pani Panchayat movement was launched in 1972 by the Gram Gourav Pratisthan in Pune in Maharashtra.

To central idea underlying the formation of the Pani Panchayats is that in a drought-prone area no individual should be deprived of a rightful share of the limited water resources on which life and livelihood depend.

Anna Hazare's work in Ralegaon Shiddi and the Tarun Bharat Sangh's work in Alwar are also lighthouses in the search for solution to the crises of drought and water scarcity.

Water conservation and sustainable use of water can only be based on democratic control over water resources.

Hence the need for a nation-wide Jal-Swaraj movement to protect this vital resource and defend people's water rights.

(The Hindu, 10/05/2000)

(Drought Hydrology, Gujarat/Rajasthan)

E(41) As the Sky fails to give Water, Gujarat goes to the sea for help

So what Gujarat has hardly any rainfall to speak of. It has one of the longest coastline in the country. Chief minister has laid his hands on a unique project for water –starved Gujarat. It is the stuff dreams are made of: A simple

project, which will convert abundant sea water into drinking water. The person who is going to make this reality for the state reeling under drought is Channai-based Felix Ryan, adviser to the UN, winner of the UN Global 500 Environmentalist award and director general Ryan Foundation. Ryan was Director, Ministry of Industry. A "poor man's technologist" as he is called, his project is simple and requires hardly any investment based on a simple evaporation and condensation principle.

" It is as simple as brewing liquor in villages," he says. It requires building a huge stainless steel container and then putting a smaller container inside. The outer steel container is covered with a white transparent plastic sheet, allowing the middle portion to sag like a funnel over the middle container. This funnel – like depression is filled with cold water. The pure, clean water condenses in the smaller container into the inner container after condensing on the plastic sheet. Burning expensive fuel is replaced with stainless steel, photovoltaic cells, and reflectors bigger than dish antennas and magnifying glass. " This enhances the heat by 40 % ," explain Ryan.

He has managed to draw attention to his scheme in Channai where after a few demonstration, some households have installed this simple device on their roof-tops. The sea water that is heated up is three times that of the potable water that is obtained in the end. His project has been better received in exotic countries like Somalia and Sierra Leone in Africa where it has been tried, tested and proven to be successful. A module has also been prepared in Osaka, Japan. In India, after writing several letters to various government, he caught the attention of Maneka Gandhi who initiated the meeting with L.K.Advani and Patel. In India, it will be for the first time in Gujarat that he will be attempting on a large scale.

An investment of Rs.22 lakh would be required to obtain 30,000 gallons of water that would be sufficient for as many as 50,000 people or a small village. The location and the actual fabrication of the vessel is still to be chosen in Gujarat. However, Ryan says that the first thing that he will do when he reaches the state, he will try another project, and "I will pump huge amounts of sea water into the dry wells adjoining the coast line Since salty water is heavier, it will go into the aquifers and push the fresh water up," he says. But what about the ground water turning saline or the soil becoming unfit for irrigation. These are myths. The water goes so deep down that it does not affect the soil and because it is heavier, the fresh water is what comes out," he clarifies. He has already attempted this successfully in Sierra Leeone in 1982.

(Indian Express, 06/05/2000, Sonu Jain)
(Water Availability, Gujarat)

IE(42) Rajkot Residents join hands to Desilt Lakes, Dam

Officials of State Irrigation and Rajkot Municipal Corporation always argued that desilting of Dams and Lakes was not feasible. They cited high costs, wastage of man-hours and the problem of disposal of silt. They said it was easier to construct a dam than desilt existing reservoirs. But Rajkot residents are determined to prove them wrong. Citizens from all walks of life, under the Arvind Maniyar Jankalyan Trust, have decided to desilt Randarda lake, Lalpari lake and Nyari dam to increase their storage capacity. Around 150 trucks work 12 hours a

day, unloading silt from Randarda lake in the Pradyuman Park area. Ten earth-moving machines have also been pressed into service to fill the trucks with silt. The work is conducted under the supervision of volunteers who have decided to give *Shram Dan* for the project. Situated on either side of a small hillock on the outskirts of the city, the twin lakes of Lalpari and Randarda were built by the erstwhile ruler of Rajkot about 120 years ago. These used to cater to the needs of the city, but gradually their storage capacity decreased by almost 50 to 60 per cent due to massive siltation.

Trust member Mavjibhai Dodia., the brain behind the project, says he was inspired by the example of Jamnagar, where the local people had started desilting of a lake in the town. Senior RMC engineer H.A. Thakrar says desilting of the lakes will benefit the city in many ways. It will increase the storage capacity of the lakes and improve the underground water table in the areas near the lakes.

(Indian Express, 04/05/2000, Parag Dave)
(Lake Hydrology/ Surface Water Hydrology, Gujarat)

H(55) Water Harvesting - a Success in Garhwal Village

A small village in the Garhwal Himalayas has a heartening tale to tell amid these times of severe drought in Gujarat and Rajasthan.

Only three years ago, Satengal, about 45 km from Doon valley, had no potable water. Villagers spent most of their time in carrying water from long distances, either on their heads or on mules.

Today, every house in the village has enough drinking water with the launching of "Swajal", a project under the State Government, in 1996. The village has today become a model for successful rainwater harvesting. The Rural Litigation and Entitlement Kendra, a Doon-based NGO, carried out the "Swajal" scheme in Satengal from 1996 to 1998. The system of rainwater harvesting was being adopted for the first time in Garhwal and the team worked hard at convincing the people that it was safe to drink treated rainwater.

According to Col.(Retd.) Kuldeep Singh Mann, in charge of the team, the villagers had a stake of 10 per cent in the cost of the project in the form of voluntary labour or cash. Under this scheme, a ferrow cement (FC) tank of 7,000 litres capacity was designed. Rain water from the rooftops was collected through tin sheet troughs and channeled through PVC pipes to collect in the tank through a filter. The cost of each FC tank worked out to Rs12,000.

The RLEK chairperson, Mr. Avdhash Kaushal, said rainwater harvesting alone held the key to a water abundant future. Talking about the success story of Satengal in the Jaunpur block of Tehri district, he said rain was the only source that did not carry a price tag at the point of delivery.

In areas like Doon Valley where there is an abundance of rain, harvesting of rainwater would be an extremely wise step as it would leave the groundwater for the future as well as for places which have very less rain, he said.

(The Hindu, 3/05/2000)
(Water Harvesting, Garhwal, RELK)

IE(42) Ahmedabad Falls Back on Old Way of Conserving Rain Water

Underground water tanks (tanka), a common feature in the city till a century ago, are being revived for conservation of rain water. There are 65 underground tanks in 19 polls along a small stretch from Khadia old police Chowki to Bala Hanuman temple. The Samiti, a local organisation headed by Health Minister Ashok Bhatt, formed a committee in March to survey tanks in the area. The 11-member committee has come out with interesting findings. In laboratory analysis, water stored in these tanks has been found to be of quality prescribed by the World Health Organisation and ISI, committee member Ashutosh Bhatt said. Hardness is almost absent and the bacteria found is due to the long duration of storage and can be eliminated by using chlorine.

A known method of conserving water in Gujarat for two countries, a typical underground tank has the capacity to store one lakh gallons of water, enough to meet the needs of a family of 10 for a year, says Bhatt. He has one such tank in his house. The rain water is routed through a copper pipe from the rooftop to a chamber below the plinth level. This chamber is connected with the main underground tanks through a slanted inlet pipe. The entire tank is roofed at the plinth level, the roof serving as an open courtyard. A manhole cover with a lid serves as an opening to draw water. The other side of the tank roof has an opening for removal of sludge. The bottom can be approached through stone or cast iron steps.

(Indian Express, 02/05/2000, Tanvir Siddiqui, , NGO's Project)
(Water Conservation, Gujarat)

April,2000

DH(3) SC allow State to raise Almatti dam height to 519.6 m.

The constitution bench of the supreme court today delivered the much-awaited judgement in the Almatti case allowing Karnataka to raise the height of the dam to 519.6 m as against 524m. sought by it, but provided for setting up of a new tribunal for allocation of surplus water of the Krishna river.

In significant findings, the five member bench observed that projects of permanent nature of Andhra Pradesh which were based on use of surplus water not be entertained and also ruled that the allocations by the Bachawat Tribunal, which went into the entire gamut of Krishna water issue, under Scheme A for 2,060 tmc of dependable water flow on " en bloc basis and not project – wise" as claimed by Andhra Pradesh.

Under Scheme A, the Bachawat tribunal had allocated Karnataka 700 tmc of water, Maharashtra 560 and Andhra Pradesh 800 with surplus water to be used by Andhra Pradesh. It had said that though Andhra Pradesh could use surplus water, it could not claim right over it.

As regards the highly controversial Almatti dam height issue, which Karnataka wanted to be raised to 524 m in the face of opposition by Andhra Pradesh, the court held that there was not even an iota of restriction imposed on Karnataka by the tribunal to raise it to 519 m..

Dealing with the original suit of Andhra Pradesh, it noted in detail that the expert committee had agreed that the height could be raised upto 519 m. The court also reffered to the report of a technical committee of Indian Institute of Science, Banglore, in this regard. It held that as regards Karnataka's plea of

raising the height to 524 metres, it could not be adjudicated by this court as it formed part of the river dispute.

The bench said Karnataka has to get permission from all authorities concerned as envisaged under the law, before raising the height of the dam 509 metres to 519.6 metres.

(Deccan Herald, 26/04/2000)

(Dam Hydrology, Almatti Dam, Andhra Pradesh and Karnataka)

H(56) Govt. rejects plea to declare Drought a National Calamity

The Vajpayee government today refused to declare the current spell of drought in Rajasthan, Gujarat and Andhra Pradesh a national calamity but said it would treat the famine as a national problem by providing all assistance to the affected states.

Emphasising the need to chalk out a plan to preserve rain water and carry out water harvesting, the prime minister assured the members that the paucity of funds would not come in the way of providing assistance to the affected states.

The Government has also set up a control room in New Delhi to monitor and co-ordinate all relief measures.

According to official figures, as many as 9421 villages in 17 districts of Gujarat, 23406 villages in 26 districts of Rajasthan, 17431 villages of seven districts of Andhra Pradesh and 3240 villages of seven districts of MP have been affected by drought.

(Deccan Herald, 26/04/2000)

(Drought Hydrology, Rajasthan, Gujarat and Andhra Pradesh)

DH(4) All-party meeting to discuss drought situation today

The Centre has convened an all-party meeting here to discuss the grave situation of drought in five states, especially Rajasthan and Gujarat, even as hunger and thirst have forced thousands of people in three districts of Rajasthan to leave their home and hearth in search of food and water. The union government today asked the Water Resources Minister to take on a war-footing to tackle the drought situation in the affected states. A Central control room has been set up in the national capital for round-the-clock monitoring of the drought situation under the charge of commissioner(Indus).

The control room will co-ordinate with the Ministries of Railways, Surface Transport and Agriculture, while the Ministry of Water Resources has been directed to make available latest information on water availability in Indira Gandhi Canal, Mahiriganj reservoir and Ukai Reservoir to Gujarat and Rajasthan government on weekly basis.

The states have also been directed to make available information on water availability in reservoirs located near drought-affected areas.

(Deccan Herald, 25/04/2000)

(Drought Hydrology, Rajasthan & Gujarat)

March,2000

IE(44) Last Man, turn off the tap – Drinking Deep from the Waters of Apathy

The unthinking exploitation of groundwater is one of the big scandals of our time. Everybody recognises a polluted river or one that has been grievously over-exploited. Few realise that precious water-bearing aquifers deep under the earth are being subjected to the same pressures. In 1994, the Central Pollution Control Board undertook the first survey to monitor groundwater quality. It revealed that although at least 80% of the country's drinking water requirements were being met through groundwater reserves, in numerous regions of the country industrial effluents had either been directly injected into aquifers by unscrupulous industrialists or had leached their way into them.

Random testing yielded bizarre revelations. When the science and environmental magazine "Down to Earth" tested a sample of water taken from a tubewell near an industrial area in Panipat, it contained mercury concentration that was 268 times the permissible limit. The magazine also reported that the residents here and in other danger zones, like the Mumbai Thane belt in Maharashtra, the Vapi belt in Gujarat, the Durgapur –Assonsol region of West Bengal, generally believed that groundwater is " pure". There is to date no comprehensive policy, no attempts to list priorities , no specific laws to regulate groundwater use in India, although the Central Groundwater Board has stated that watertables around almost every Indian town and city are declining at a rapid rate and that extraction is far exceeding annual recharge.

Gujarat now cries for water from the river, but what is its record in preserving the water resources that it had? Visit Dhoraji town near Rajkot, a region that has become synonymous with Gujarat's water famine, and ask people there what became of the Bhadar river that had once provided them with drinking water. A 90-km stretch along the river was rendered dead, with even the subsoil polluted. Ecologists estimate that it could take a hundred years for the river to regenerate itself. In Valsad, it's the same story, where the river Kolak received untreated and partially treated effluents from the several hundred companies of the Vapi Industrial Estate.

Critics of the Narmada-Sardar Sarover Project maintain that while the authorities claim that the project will provide irrigation to 18 lakh hectares of agricultural land in 12 districts of Gujarat and permanently eradicate drought in the state, the reality could be quite different. In other words, the water from this much disputed project may not go very far in quenching the thirst of the really needy in Saurashtra and Kutch.

All this raises serious questions about the use of, and access to, water in India. As the years go by the tensions will only increase. According to data put forward by the Rajiv Gandhi Drinking Water Mission in 25 years India would require 105 million hectare metres (mham) of water – a figure that stood at 38 mham in 1974. Already, an estimated 44 million people suffer from lack of access to potable water. Today, women and children in some forsaken regions of the country dig into a dry river bed and wait for the water to seep into the holes.

(Indian Express, 27/03/2000, Pamela Philipose)

(Water Crisis/ Ground Water Hydrology, General)

IE(45) Gujarat's Historic Kankana Lake in danger of drying up

Some patches of ground have already surfaced, although summer has just begun, Officials say the lake has a six-foot silt deposits, which has reduced its average depth to around 10 feet from the original 16 to 17 feet. Ahmedabad Municipal Corporation officials say the lake survived many poor monsoons; the last time it dried up was 25 years ago when there was no rain at all. Extensive use of the lake for immersion of idols, earthen lamps and other material on religious festivals in recent years has led to its present condition.

(Indian Express, 26/03/2000, Sachin Sharma)

(Lake Hydrology, Gujarat, Kankana Lake)

IE(46) Keeping hopes afloat for water on earth

"Enough is said while little is done through such conferences," said Anna Hazare, as he stood confident before the world explaining how the people of Ralegan Siddhi in Maharashtra realised all by themselves a transformation from dire straits to prosperity. Twenty years ago the village showed all traits of abject poverty. It practically had no trees, the top soil had blown off, there was no agriculture and people were jobless. Hazare started his movement concentrating on trapping every drop of rain. So the villagers built check dams and tanks. To conserve soil they planted trees. The result: From 80 acres of irrigated area two decades ago. Ralgan Siddhi has a massive area of 1300 acres under irrigation. The migration for jobs has stopped and per capita income has increased 10 times from Rs.225 to 2,250 in this span of time. No world bank funding, no – government grants – only people's enterprise.

Rajendra Singh of the Tarun Bharat Sangh worked on similar lines to bring back to life the dead river Aravali in Rajasthan long after it had vanished from the face of the earth following no recharge and overdrawing of ground water. Singh's only capital was the villagers who were fighting the harsh realities of nature and were willing to give life a second chance. The age old traditional method of rain-water harvesting provided the easiest solution to people's miseries as after almost a decade of water conservation, the dead river came back to life. Starting with Kishori village in Alwar district, the lifeline has now extended to 750 villages in the state. It is completely people initiative. We did not wait for the World Bank, government or non-government agencies to come to us to lend help. We were the sufferers and we found a solution to our own problem" says confident singh.

(Indian Express, 24/03/2000, Devinder Kumar)

(Water Management, Maharashtra, Rajasthan)

H(57) 'Paradigm shift in handling water issues needed'

"The business as usual approach is not going to solve the water problems of the future. What we need is a drastic change in the ways we handle water issues if we have to conserve this precious resource for the benefit of the generations to come." This is the clear message of the World Water Commission at the Second World Water Forum.

Dr. Ismail Serageldin, Chairman of the Commission, stressing this point said that the role of Governments should be re-defined to act as enablers of community action and regulators of private sectors involvement in managing and ensuring an equitable distribution of water . "It should be an active participatory

process that should focus on protecting the natural resources for future generations," he said.

The World Water Council, an international water policy think- tank established in 1996, has identified the world war challenges in the 21th century . Dr. Mahmoud Abu Zeid, President of the council, dwelling on the key water issues said that without full public participation, it was impossible to envisage or implement sustainable solutions. Raising public awareness was essential to ensuring public involvement. "Such awareness can be achieved through in the education system , greater funds into research and development, and enlisting the support of the civil societies".

Discussing the water scarcity , the council has pointed out that the finite supply of water can be augmented by reducing consumption and recycling and re-using wastewater. Filling the gap from non-conventional sources will also address the other side of the equation. However, there are technological, economic and environmental limits to these solution strategies. Present day infrastructures are also inadequate in addressing future problems.

A steady decline in financial outlay to water development in the late 1980s and 1990s, and marked decline in international development assistance resulted in severe slowdown in water development. Right now, funds for operation and maintenance are in limited supply with existing schemes in dire need of repair and replacement. The creation of an enabling environment to reverse the trend is needed.

The council has pointed out that it was both essential and mandatory that institutional policies, strategies and legal frameworks be harmonised and co-ordinated at some kind of centralized level, between regions, nations and at the global level . This unified water management approach will help in reducing the wastage of resources and improving usage efficiency.

Several time- honoured eco-friendly technologies for harnessing rainwater and equitable sharing of the precious natural resources were brought to light.

(The Hindu, 20/03/2000)
(Water Management ,General)

H(58) New waste- disposal method evolved

The Tata Energy Research Institute(TERI) has developed a high rate digester for fibrous and semi- solid municipal waste with the promise of revolutionising the waste disposal industry.

Described as TERI acidification and methanation process, for which patent has also been filed, the digester is said to be quick, economically viable and suitable for food and agro- based industries and markets.

In the face of evident environmental drawbacks of waste disposal methods like land- filling and incineration, the process of biomethanation of waste by anaerobic digestion has economical and social benefits apart from being environment- friendly. The technology is recognised internationally. According to the experts who had been working on the project since 1996, research in the field of biomethanation has revealed the organic fractions of solid waste have high biochemical methane potential. Their high moisture content and availability of nutrients make them good substrate for biogas generation by anaerobic digestion.

The process produces both energy and compost from waste. Further, the land requirement is comparatively less than that for the aerobic composting process . For, it involves extraction of a high organic strength liquid waste from the vegetable waste in an acidification reactor and its treatment in an upflow anaerobic sludge blanket (UASB) reactor.

(The Hindu, 18/03/2000, TERI)

(Industrial effluent, General)

H(59) Radar to detect subsurface hazardous waste

Geophysicists at Ohio State University have found a new application for ground penetrating radar: detecting subsurface liquid hazardous waste. By changing the antenna configuration within a standard ground penetrating radar(GPR) device, they were able to detect deposits of creosote buried beneath an EPA cleanup site in Marion, Ohio. The technique may hold promise for finding other kinds of buried hazardous waste. Jeffery Daniels, professor of geological sciences, and his graduate students found several deposits around an abandoned wood treatment facility, including two tanks of creosote that were buried beneath several feet of cement . They reported their results in a recent issue of the journal Geophysical Research Letters.

How well GPR detects certain objects depends on the alignment of the sending and receiving antennas within the device, Daniels said. The common arrangement- the two antennas side by side – detects smooth objects like buried pipes or flat layers of rock very well.

(The Hindu, 16/03/2000)

(Ground Water Hydrology, General)

IE(47) Yamuna Water: SC pricks govt. balloon, gives warning

A month after the government patted itself on the back over improving water quality in the Yamuna and its drains as polluting industries closed down, readings have revealed that the river is as dirty as ever. The Supreme Court warned the Delhi government of stern action against any interference in the implementation of its earlier order. The court reffered to the monitoring report filed by the Central Pollution Control Board on the water quality of drains in Delhi, which joined the Yamuna at three locations. The two main parameters COD and BOD have shown a marked increase from last month's readings (03/03/2000).

According to CPCB chairman Dilip Biswas, " The readings decreased last month because there was some rain upstream." " The river water quality at Agra Canal has deteriorated further in comparison to observations taken during the January – February round of monitoring," said the CPCB affidavit. According to Rajiv Talwar, Secretary , Department of Environment, the pollutants' levels have gone up because many industries have re-opened and those claiming to have set up ETPs are not doing so. More than 500 industries have been re-opened on the ground that they have installed ETP's or they are dry units'.

In fact, the report in regard to the quality of water in river Yamuna itself shows that by the time it leaves Delhi it is no longer a river but a sewage drain. The dissolved oxygen content of the water when it enters Delhi at Palla is 9.8 mg/l. When it leaves Delhi at Okhla it is nil", the court pointed out.

(Indian Express, 12/03/2000)

(Water Quality/ Industrial Effluent, New Delhi, Yamuna)

H(60) Move afoot to make Haryana flood-free

The Haryana Chief Minister, Mr. Om Prakash Chautala, today reiterated his commitment to make Haryana flood-free and directed the State Irrigation Department to take up flood protection works on a war footing.

The Chief Minister, who was reviewing the flood protection works and World Bank –aided Water Resources Consolidation Project (WRCP) here, said one must learn from the catastrophe of Orissa and all our efforts should be made to keep oneself fully prepared to meet any eventuality. He made it clear that flood protection works would not suffer for want of funds. Mr. Chautala announced that his first priority would be to make Haryana flood-free. He directed that all arrangements be completed within the next three months. The drains should be cleaned and provided with adequate carrying capacity on war footing. Also, digging of new drains, installation of studs and strengthening of embankments, wherever required, should be taken up without any delay, he said. On the suggestion of the Commissioner and Secretary, Irrigation, Mrs. U.Gulati, the Chief Minister sanctioned Rs.8 crores for the ongoing flood protection works.

(The Hindu, 9/03/2000)

(Flood Hydrology, Haryana)

H(61) Drinking water scarce in Udaipur

Inadequate rainfall during the last four years has created severe drinking water problem in the lake city of Udaipur. Water level in the two main lakes- Fatehsagar and Pichhola- life line of the city has fallen to an all- time low and is not even fit for drinking.

The lakes are almost on the verge of drying up with water capacities falling drastically from 13,693 million litres to 12,107 million litres in Pichhola lake and from 9,729 million litres to 5,100 million litres in Fatehsagar, according to the Public Health Engineering Department(PHED) sources. With the onset of summer, the problem is expected to further aggravate when the demand for water increases.

However, the local administration is making arrangements to bring 25 million litres water from the nearby Rajsamand lake everyday for distribution-PTI.

(The Hindu, 4/03/2000)

(Lake Hydrology / water crisis, Rajasthan, Fatehsagar and Pichhola Lake)

IE(48) Pollution is down in Yamuna, says CPCB

According to the latest reports of the Central Pollution Control Board (CPCB), The condition of Yamuna is improving. The obvious precursor for the positive results, according to the Delhi Pollution Control Committee, is the four-month drive to shut down water-polluting industrial units. The Chemical Oxygen Demand (COD) in river Yamuna at Agra canal point, one of the last points of the river in Delhi, has come down from 45 mg/l on Jan. 11 to 26 mg/l on February 21.

The Biochemical Oxygen Demand (BOD) levels have remained stationary at 7 mg/l. The pollution board has also monitored drains in Delhi at 22 points. Of these, 9 points have shown a decrease in COD and BOD, one has remained the same and six have shown an increase in COD.

(Indian Express, 03/03/2000)

(Water Quality/Industrial Effluent, Yamuna, Delhi)

February,2000

H(62) Plan for Rain Water Harvesting

A master plan on the "remote sensing technique" has been prepared for rain water harvesting in 27 of the 32 districts in Rajasthan. Officials sources said yesterday that the plan, chalked out by the State Remote Sensing Application Centre (SRSAC),Jodhpur, under the Rajasthan Science and Technology Department , was not meant for five districts – Bikaner, Churu, Ganganagar, Jaisalmer, and Hanumangarh- as they do not have any scope due to sandy terrain, plane area and command area.

The master plan maps provide information on the firm banks, space for submergence, beneficiary agriculture land and wells in downstream areas. These maps are useful for taking up construction works also.

(The Hindu-29/02/2000)

(Water Harvesting/ Remote Sensing Applications, Rajasthan)

IE(49) As Salinity, Fluoride levels rise, Ahmedabad learns to live on mineral Water

An estimated 5,000 people in the western areas of Ahmedabad use mineral water everyday for drinking & cooking because the borewells in their colony give salted and hard water with fluoride content. The Gujarat Ecology Commission believes that by the end of 2000, almost 30% of the land in the state could turn saline. A survey by the Gujarat Water Supply and Sewerage Board says more than 22% of Ahmedabad district's villages have excessive fluoride content in their water and 13.6% have excessive salinity. In Ahmedabad, water tables are falling at the rate of nearly 2m every year.

There are about 18 small and medium scale mineral water suppliers and reliable market sources say there would be about 5,000 homes in Ahmedabad using mineral water daily. Hirway, who is also associated with Pravah, an organisation working on water harvesting and management, has now written to the state govt. on the need for alternatives to the present urban water supply system, which depends solely on groundwater or surface water. She points out that recycling; recharging and rainwater harvesting should be done on a massive scale.

Mahadevia, an expert in urban planning, also says that every builder must provide for recharging facilities before getting permission to construct a housing society.

(Indian Express, 29/02/2000)

(Water Quality, Gujarat)

IE(50) Mineral Water High on Chemicals: Study

Think twice before you drink mineral water next time, for you may be downing chemicals. What you take is not even aqua pure as some labels claim.

This was established by a study conducted by the Quality Assurance and Management (QAM) division of the Central Institute of Fisheries Technology (CIFT), The only body which has the state-of-art water quality testing facilities. QAM head Dr. M.K.Mukundan conducted the study on six leading mineral water brands purchased from open market. The findings revealed that not only did any of them meet the mineral water standards but also contained toxic chemicals.

The water samples were tested for 25 potability parameters including presence of toxic heavy metals, bacteria and organic chemicals like synthetic detergents. The samples were found to contain heavy metals like mercury, lead, copper, and manganese beyond permissible limits. The samples contains much more quantities mercury (0.1 to 0.6 ppm), Copper(64ppm), Lead (7 to 27 ppm) of chemicals than the permissible level of mercury (.001 ppm), Copper(1ppm), Lead (.01 ppm). The presence of manganese was also detected. In the test for bacterial presence, three samples recorded high incidents of bacterial count, though the permissible count in potable water is 100 cells per ml, when here it is 570 to 8600 cells per ml.

(Indian Express, 26/02/2000, K.S.Sudhi)
(Water Quality, General)

H(63) Centre For Water Resources In Concurrent List

The Government has proposed to bring in a legislation to transfer water resources from state list to concurrent list to ensure speedy implementation of various projects, the Water Resources Minister, Mr. C.P.Thakur, said.

"The Centre would soon initiate the process for transferring water resources from state list to concurrent list to improve water management and to overcome undue delay in the implementation of Projects", he told reporters.

Mr. Thakur said about 2,000 of 4,000 projects taken up since Independence was still pending due to various hurdles as the subject was in the state list.

Efforts are being made to complete 60 per cent of the pending projects by next year for which about Rs.500 crore would have to be spent.

(The Hindu – 24/02/2000)
(Water Management/ Water policy, India)

IE(51) Building bridges over troubled Waters

The ministry of Urban Development and the issue of private participation in urban water supply in a two-day seminar held in the Capital. While three states – Gujarat, Karnataka and Tamil Nadu – have already made small beginnings on that front. There is need for all states to look at private participation in water supply. For the Rakesh Mohan Committee report tells us that as much as Rs.27,000 crore to Rs.28,000 crore is needed each year to provide safe drinking and sanitation in all urban areas of the country while the plan allocation is only to the tune of Rs.5,000 crore every year. What's worse, around 35 to 45 % of the water supplied is never paid for. Either it leaks through the pipes or gets stolen. There are several models Indian states can look at from across the globe. However, problems peculiar to India can emerge even before such a model is put to application and what the country would need is a strong regulator. Here are three different models – Argentina, a developing country that more or less successfully achieved privatisation through a concessional agreement of water supply and is reaping benefits; the corporatised system of Sydney, and the lease agreement of Guinea, which is plauged with problems of sorts.

(Indian Express, 21/02/2000, Swati Prasad)
(Water Policy, General)

H(64) Remote Sensing – The Future

The space department has a continuity of data made available to users. This becomes necessary due to dynamic changes that occur-floods, disasters and even agricultural. In future, a satellite of 2.5m resolution in the panchromatic mode and perhaps about 15m resolution in the multispectral mode could become a reality soon. The 2.5m panchromatic data will provide overlap along the flight direction, exactly as in the case of aerial photography. This is unlike data from IRS-IC and IRS-ID that provide such overlaps by tilting the sensor or camera sideways, so that it occurs in different paths of its flight giving a slightly different perspective. Satellites launched by the Russians and Americans have been providing data of about two-meter spatial resolution for over a decade or so ago which has been made available for civil uses. Such high spatial resolution data has been in existence for military use too.

The sensors used in Indian satellites are called Linear Imaging self scanning, using charge couple devises, (CCD) which observe features on the earth's surface and then transmit them. Which had a similar function except that the scanner used to scan from one side to the other at great speed. Commensurate with the speed of the satellite, along its predetermined track, While the CCD couples and the linear imaging self-scanning devices can be treated as what happens in a lens camera and then a geometry established still the data received is not similar to what the result is from a lens camera and film negative. It is data with several picture elements (pixels), each the size of the spatial resolutions that have been talked about in a continuous form appearing like any normal picture. However such data is termed as raster data built up with several pixels which when enlarged (or zoomed in a computer) will look like a square or rectangle in close contact with the next. While this makes it easier to carry out analysis using a computer with a variety of software, it does not confirm to a specific geometry that is seen in data from an aerial camera.

Normal maps derived from photogrametric processing of aerially remote sensed photographs directly gives us line maps, which are called as vector data or vector maps. Therefore, two types of data formats become available using satellite and aerial remote sensing. Whether data is got from satellite altitude or aerial altitude, both can be called as sensed data.

But such data has its merits and demerits although conversion from one format to the other and vice-versa is possible. In fact the use of aerial photographs for making topographical maps has been in existence for over 60 years. It has under gone considerable sophistication over the years starting from graphical methods analogue methods, analytical methods to digital methods with correspondence improvements in camera systems and lenses and improved flight navigation. Right now lens having around 150 lines per mm, are said to be available with practically no distortion and with image motion compensation devices. Images show a slight movement of shift occurring due to movement of the aircraft during the very small time of exposure. There are devices to compensate for this so those pictures are sharp in all aspects. In addition, Global Positioning Systems (GPS) now enable the determination of ground controls in terms of latitude and longitude by using a series of 24 satellite orbiting the earth at six different phases of the earth at an altitude of about 21,000 km. Which emit signals regularly. These signals can be received using GPS receivers at any point on the ground, which then can be processed to determine the precise geographical position of the point. To obtain accurate standards, differential GPS

observations have to be adopted. A single receiving unit which when it views the sky, can receive signals from four to six satellite at a time, but positional accuracy may not be of the kind of accuracy needed in map-making. Two such units one placed at a known base station and the other kept moving from point to point where control values are desired have to be used. This procedure is called differential GPS usage.

GPS was a set of 24 satellite put in orbit by the United States military and was originally known as Navigation Satellite Imaging and Ranging (NAVSTAR, 1974).

In modern aerial photography, the aircraft has a GPS device so that it provides information on the co-ordinates of the centre (or principle point) of the photo at the time of each exposure. This method improves accuracy, as well as reduces work on the ground to provide control points for subsequent mapping. Some remote satellites are also being loaded with such GPS receivers. A company based in the United States recently launched a satellite to provide spatial resolution data within a meter and which got lost in space. It is now planning another similar satellite. IKNOS to be launched shortly. It is expected to have a high powered GPS receiver to provide positional accuracy of each pixel on the ground within about two meters. It is yet to be seen to what extent this mission will be achieved possible only after such data becomes available.. But it will be expensive covering smaller ground area. Such data is expected to be distributed in India soon.

(The Hindu, 20/02/2000)

(Remote Sensing Hydrology, General)

IE(52) SC Directions to Keep Delhi Clean

To ensure cleanliness and pollution-free environment in Delhi, the Supreme Court directed the authorities to levy a fine of Rs.50 on anyone littering or violating the provisions of the Municipal Corporation Act, bye-laws and regulations relating to sanitation and health. Such a collection would be in force till a suitable scheme was framed by the authorities. The government of NCT was directed to appoint Magistrates for each Board/Circle/Ward to try offences relating to littering and causing nuisance, sanitation and public health.

(Indian Express, 19/02/2000)

(Environmental Hydrology, Delhi)

H(65) NDMC to harvest rain water

In an attempt to find a permanent solution to the city's acute water crisis, particularly during summers, the New Delhi Municipal Council (NDMC) has decided to launch a rainwater-harvesting project. The experimental project to be launched in association with the Central Ground Water Board at four sites – Talkatora Garden, Nehru Park, Lodhi Garden and Khushak Nallah – is likely to be completed in the next couple of months. "Once the project proves successful, it will be extended to other areas also", said the NDMC Chairman, Mr. B.P.Mishra, adding that the purpose was to harvest as much rain water as possible.

The project at four select sites is likely to yield 40,000 gallons of extra water , he added. Senior NDMC officials claimed that the rainwater harvesting project is likely to make these gardens self- sufficient in water. The project, which

will serve as a model for other civic bodies of the country, is expected to increase the depleting ground water level of these areas. As part of the project, special pits and trenches would be dug at these places. These trenches would then be covered with grass so those rain water seeps in. Railings would be provided around these trenches and pits.
(The Hindu, 9/02/2000 By Lalit K. Jha)
(Water Harvesting- New Delhi)

H(66) Government readying to privatise water supply

The Central Government is preparing the grounds for privatization of water supply and sanitation services in a big way so as to make these services more efficient and dependable. As a major step forwarded in this direction, a group of experts will hold a brain- storming session to formulate a policy paper on private participation in these two key areas, seen as part of the infrastructure sector on the basis of the recommendations made by a two- day meet on privatization of water supply and sanitation which concluded today.

According to Mr. Ashok Phawa, Secretary, Ministry of Urban Development, once the policy is formulated, it should not be difficult to either find resources for water supply and sanitation projects or motivate the private sector to take them up. The Government was not averse to the corporatisation route to bring about efficiency and improvement. Several models of private participations successfully tried out abroad are available and could be selected and implemented here depending on their suitability.
(The Hindu, 9/02/2000)
(Urban Hydrology/ Water Policy, New Delhi)

IE(53) Going Deep into Woes of Urban Water Supply

A two-day workshop " Seminar on Private Participation in Urban Water Supply and Sanitation" – organized by the world bank and Ministry of Urban Development that ended today discussed ways in which more efficient and sustainable water supply and sanitation can be provided in urban India and means by which mounting losses incurred by urban local bodies can be curtailed.

Speaking to newsperson Secretary, MOUD, quoted the Rakesh Mohan Committee report which says that as much as Rs.27,000 crore to Rs.28,ooo crore is needed each year in order to provide safe drinking water and sanitation in all urban areas of the country. However, the plan allocation is only to the tune of Rs.5,000 crore every year. So a gap of around Rs.22,000 crore is added each year to the existing dismal water supply and sanitation scenario. What's worse, around 35 to 45 % of water supplied is not paid for – either it leaks through rusty or broken pipes or is stolen.

The seminar concluded that there were many private sector participation options and each city and state would have to select the one that is best suited to it. These could include in certain cases two stages that start with service management contracts and then continue with leases and concessions where more risk's would be shifted to the private sector.

Three states – Gujarat, Karnataka and Tamil Nadu – have already begun the privatisation process for urban water supply. State Govt. representative and experts are meeting again tomorrow to convert the deliberations at the seminar into a policy paper that is acceptable to the state governments.

The seminar studied various models, such as those of Latin America, Africa and Argentina. According to Pahwa, inviting private sector participation in Water supply would require a change in the municipal legislation. Moreover, Pahwa said that a strong regulatory mechanism was quintessential for privatisation of water supply since disputes were inevitable. Speaking on tariffs, he said they could be structured in a manner that the poor paid lesser tariff as compared to the better off. A recent World Bank study estimated the annual cost of environmental degradation in India at 4.5 % of gross domestic product. Out of the total costs almost 60% were estimated to be due to economic losses from unsafe water and unsanitary excreta disposal.

(Indian Express, 09/02/2000)

(Urban Hydrology/ Water Management, General)

January,2000

H(67) 'Indira Canal Water Not Potable'

The water of Indira Gnadhi Canal, the biggest in the world covering about 20 lakh hectares and touted as the lifeline of 188 water scarcity-prone villages of Bikaner, reportedly a thousand times more toxic than the permitted safety levels.

According to sources in the State Public Health and Engineering Department (PHED), the highly contaminated water of the canal, used by about one lakh people across Bikaner for drinking and other purposes, is not potable at all and is suitable for no purpose other than irrigation.

"The bacterial count is a thousand times higher than the standard limits which means the water is not worth drinking and that it should strictly be used for irrigation only along the canal areas in the region, " sources said.

The PHED entrusted with the task of treating canal water to make it potable, has got few treatment plants for the water which, they said, "is highly contaminated due to several sewage outlets into the mainstream of canal at various junctions in Punjab and Haryana."

Besides sewage openings, decomposed human and cattle bodies, which float in from the neighboring States, are yet another source of contamination.

The PHED had submitted an epidemiological study report on jaundice outbreak in Hanumangarh and Sri Ganganagar districts of Bikaner on January 28, to the state government .

"We are aware that the water which should contain at the most only 16 bacteria types is contaminated with thousands but the Indira Gandhi Canal board officials have refused to give us their field analysis reports because they do no want the state government or the board to be blamed for it," says Sohanlal Modi, chairman of an NGO based in the Chhattergarh village.

"We asked them to give us the report so that we could pursue the matter with the higher authorities but they refused saying they will get into trouble, Mr. Modi said. The officials who conducted the field analysis were themselves surprised to find that the people survived the effects of the highly contaminated water.

On being contacted, the Indira Gandhi Canal Board officials, however, denied conducting any such tests.

"As far as the board is concerned, we have no information about any such tests," say Mr. A. K. Gupta , Chairman, Indira Gandhi Canal Board, and Jaipur.

Coupled with bad drinking water, contaminated environment is another reason for high incidence of malaria and anemia in the region.

"Malaria is directly associated with contaminated environment and toxicity of water. A recent study in the region estimated that malaria was directly responsible for about 60 per cent of the cases of severe anemia among women and children," says Dr. Jyotsana Rajvanshi, associate fellow with the Institute of Development Studies (IDS), Jaipur.

(The Hindu, 31/01/2000)

(Potable Water/ Water Quality, Rajasthan, Indira Canal)

H(68) French Company Enters Water Sector

The French multinational group, Vivendi, which has a turnover of over $40 billions is planning to enter the water and utilities sector in the country. It has already taken up waste management project in channel and a water treatment plant in Bangalore.

This was disclosed by Vivendi's head of International Affairs, the former French Minister, Mr. Thierry de Beauce, at a press conference here.

He said Vivendi was interested in making substantial investments here because of the vast scope for providing water to the people. Though the elite in the country had sufficient supplies of potable water, the problems of the masses remained acute. He felt Vivendi's expertise and investment could provide support in this area. The focus would be operations and maintenance of water and utilities rather than building new water-works.

The Vivendi group was founded in 1853 as the Compagnie General de Eaux. It began as a public services company with rights to distribute water to Paris and Lyon, the two largest cities of France. Gradually, it expanded to other cities in the country and across the border into neighboring Italy and Portugal.

Vivenid's activities essentially fall into the categories of utilities, communications and construction. Utilities include water supply and management, energy, thermion – mechanics, sanitation and transport. This division contributes about 48.6 per cent of the group's total turnover. The companies in this sector include global giants such as the compagnie Generals des Eaus, CGE Australia, General Utilities U.K. Sithe Energies Inc. (USA), compagnie General d'Entreprises Automobiles, Onyx and Connex Rail (U.K.).

The communication division comprises of telephone services, multimedia and audio-visual activities and publishing.

(The Hindu, 30/01/2000)

(Water Management, New Delhi)

H(69) River Kali Polluted To Dangerous Levels

People living in about 1,700 villages and a dozen towns along the Kali river flowing from Barwas in Saharanpur district to Kannauj are consuming highly polluted water and may become victims of some epidemic any time, feel experts.

Referring to a study by the Central Ground Water Board, the experts said levels of pollutants including heavy metals and industrial sludge had reached alarming proportions in the river and even handpumps drawing water from a depth of 35 meters were containing pollutants sufficient to play havoc with the human or animal body.

The Kali passes through towns like Saharanpur, Deoband, Muzaffarnagar, Meerut, Ghaziabad, Bulandshar, Aligarh, Eta, Farukhabad and Kannauj before falling into the Ganga.

Presence of a salt of cyanide had resulted in over 100 species of fish getting extinct from the river over the past 40 years.

Similarly release of heavy metals and toxic material from various industries and slaughter houses into the river had led to chronic ailments among people living along it.

Unless step are taken to immediately check further pollution of the river and cleanse it of the impurities, people living along it will continue to suffer from various ailments which may assume epidemic proportions during summers or monsoons, the experts felt.

(The Hindu, 29/01/2000)
(Water Pollution, Uttar Pradesh, River Kali)

H(70) New Water Filter

Scientists at National Chemical Laboratory (NLC) in Pune, have come up with a water filter that can remove microbes from drinking water.

The filter has pores small enough to exclude virus and bacteria and yet allows passage of water on a slight tap pressure. Instead of electrical power, it runs on mechanical power, which makes it suitable for village environment.

Bugs that causes typhoid, dysentery, tuberculosis, cholera, polio, hepatitis and encephalitis can be removed by the filter, according to B.D. Kulkarni of NLC who along with his team developed and patented the filter.

The cost of the membrane-treated water would be around 83 paise per litter and if the water is free from undisolved suspended particles, it can last upto three to four years, he said, adding that the system is self-cleaning too.

It is based on a technique called ultrafiltration (UF) that allows formation of pores smaller than the dimension of microbes.

The membrane was a successfully tested with Escherecha coli bacteria and Picornia type virus as well as with small molecules like albumin, casein and polyethylene glycol.

Chlorine treatment- the commonest water treatment method –requires harsher condition and cannot remove spores and cysts completely.

Other methods such has ultra violet or ozone treatment, too have disadvantages as the remnants carrying residual toxins remain in water.

On the country, the new UF technique only need membrane replacement after every three to four years, he claimed.

The system consists of a mechanical pump that circulates water from the tank to the membrane at a given pressure. The feed water is passed through the membrane in a tangential direction so those large molecules do not block the pores. The technology is already being used in France and Japan.

(The Hindu, 27/01/2000)
(Water Quality, General)

H(71) Delhi's Ground Water Unsafe

Almost 50 per cent of the Capital's ground water is unfit for drinking due to the overall impact of physio-chemical contents such as heavy metals. Total dissolved solids, nitrates, fluoride, and trace metals, says an official study on 'the

Status of ground Water Quality and Pollution Aspects in NCT-Delhi". The study was done for the Union Ministry of Water Resources jointly by the Central Ground Water board and the Central Pollution Control Board Random surveys were done in Kanjawala, Najafgarh, city are, Alipur, Mehrauli and Shahdara blocks.

Besides, Delhi is the largest contributor of pollution to the Yamuna, which receives 80 per cent of the National Capital Region's sewage and industrial waste through 16 drains between Wazirabad and Okhla. The city generates about 1900 MLD (million litter per day) of sewage against an installed capacity of 1270 MLD of treatment facility. The untreated sewage, along with partlally treated sewage, is discharge into the Yamuna every day, says the study.

Although the impact of Yamuna water quality specifically on ground water had not been studied, the study reveals that surface water bodies play a significant role in the ground water flow system as they migrate laterally and vertically across ground water aquifers.

Urbanisation, industrialisation and agriculture are said to be the major causes for ground water pollution. Extraction of excessive quantities of ground water has brought about depletion of ground water sources, salt water intrusion and deterioration of water quality. The disposal of sewage and untreated effluents into unlined channels or open fields has become the source of ground water pollution.

Excesses have diminished the quality of ground water. Overpopulation overexploitation of ground water, lack of rainwater harvesting, improper disposal of sewage and industrial waste water, callous disposal of municipal and industrial solid waste and lack of public awareness have been shortlisted as the causes for ground water contamination.

The various treatment options are physical, chemical and biological processes including de-fluoridation, removal of nitrates, iron and heavy metals, which transform raw ground water into potable water. The Authority has already initiated registration of ground water structures to monitor overexploitation of ground water. The study calls for direction to industries and hotels to adhere to limits on ground water withdrawal, particularly in deficient areas. It suggests an amendment to building by-laws to facilitate roof water harvesting of rain water and re-vitalisation of water bodies.

It has been recommended that water drawn from all ground water structures be tested to ascertain, whether it is fit for human consumption or not , all water drawn from hand-pumps be chlorinated to eradicate bacterial presence, domestic level de-fluoridation be undertaken in ground water sources especially in Kanjhawala, Najafgarh and City blocks, open wells be covered with wired mesh and chlorinated, and a battery of shallow tubewells be constructed in flood-prone plains to harms monsoon overflows.

The study has recommended strongly that untreated sewage not be discharge into the river as it has a severe impact on river water quality, which is already critical. Landfill sites should be selected after detailed hydrogeological studies and be scientifically designed. Also, ground water quality should be regularly monitored near the landfill sites.

(The Hindu, 27/01/2000)

(Water Quality/ Ground Water Hydrology, New Delhi)

·) **Water Harvesting – Option for the Next Millennium**

It contains the messages from Shri Atal Behari Vajpayee, Smt. Bijoya Chakravarty, Dr. C.P.Thakur, Z. Hasan and Dr. D.K.Chadha about the neccessity of water and its management for next years. C.G.W.B. has been given the stress on water harvesting and artificial recharge, its techniques and the benefits of these. CGWB has also been offered their technical assistance. Some successful stories and on-going projects have also been described in this paper.

(Indian Express, 26/01/2000)
(Water Harvesting, New Delhi)

2) **Plan To Link North, South Rivers To Be Revived**

The Union Government is to take up a project for linking the rivers of the North and the South to ensure adequate water availability and food security for the whole country. Linking of the rivers of the North and the South, especially the Ganga and the Cauvery, is an old idea, now being revived by the National Democratic Alliance (NDA) at the Center. The Unions Minister for Water Resources, Dr. C. P. Thakur, told newspersons here on Saturday that the North-South rivers would be joined with canals. There could be a garland system linking various rivers and then basin to basin linkages as well. Even the Sharda of the neighbouring Nepal could form a part of the system.

Dr. Thakur said that there had been a proposal, conceived by the former Union Minister of State Mr. K.L. Rao, some years ago to link the Ganga and the Cauvery. The basic approach was on the grounds that the North had more water sources compared to the Southern parts and the Ganga had surplus flow during the three months of monsoon, which needed to be drained out. The Center would consider approaching and international funding agency once the whole concept was worked out, he said.

There could be South-South connections and North-North connections for rivers. In the North the Brahmaputra could be connected by canals to the Kosi and to the Ganga. Water could be brought as far as Rajasthan from the Shard in Nepal. Once Tapti and Son Canal were linked, Delhi, Rajasthan and even Lucknow would benefit from it. "We have to get ready for the next century. Water is going to create more tension than anything else in the world" , he said.

However Dr. Thakur conceded that a stupendous Rs.3.3 lakh millions would be required for carrying out the project.

(The Hindu, 24/01/2000)
(Inter-basin Water Transfer, Ganga & Cauvery)

T(1) **Chambal Lift Project may Quench Ajmer's Thirst**

To tackle the problem of potable water in the district, a Rs.264 crore Chambal Lift Project has been prepared. PHED Minister Ram Singh Bishnoi has instructed the water supply department to send him the proposal about lifting Chambal water project.

As per this project, Chambal river water would be lifted from Talore near Bundi for the district and for this separate pumping stations would be installed at Kota, Bundi and on Devil highways. This project would be ready by 2006 for which a 250-km long pipeline would be laid upto Ajmer.

On an average, about three crore gallon water is supplied from Bisalpur dam to Ajmer, Kishangarh, Kakri, Sarwer, Nisirabad and Beawar daily. The water level of Bisalpur dam is 305 metre at present and now the Government has approved a Rs.44-crore project to supply Bisalpur water to Gulabpura and Bijayanagar.

With the completion of this project, about 232 villages of Bhinai, Bandanwada and Masuda areas would be connected with the Bisalpur dam and about five crore gallon water would be lifted on an average daily for Ajmer district from this dam.

On the other hand, the State Government has approved a 1,600 – crore water supply project for Jaipur from Bisalpur dam. With the completion of this project, another 15 crore gallon water would be lifted from this dam daily for Jaipur and other cities. The project is expected to be completed by the year 2006 but water supply would be started to Jaipur city in 2002.

(The Hindustan Times, 23/01/2000)

(Water Availability / Potable Water, Rajasthan)

H(73) Improving Rainfall Forecasting Accuracy

New Research shows that the accuracy of three-day rainfall forecasts in the tropics can be improved by as much as 100 % by combining existing forecasts models with satellite rainfall data. These findings were presented today at the annual American Meteorological Society's (AMS).

Researchers at Florida State University have found that by adding rainfall observations collected by NASA's Tropical Rainfall Measuring Mission (TRMM) satellite and other meteorological satellite to forecast models, they can more than triple the accuracy of rainfall forecasts for the first 12 hours of the forecast.

In addition, they found that using the past rainfall data collected from defense meteorology satellites and NASA's Tropical Rainfall Measuring Mission (TRMM) spacecraft could be used to increase the forecast skill even further. Their method examines the behaviour of a number of different forecast models and selects those properties from each model that lead to the true rainfall as observed by the TRMM satellite in the past. These model properties are then used to predict the rainfall for 3 days into the future with remarkable success.

"Including rainfall into the multiforecast model. Or superensemble model is a unique approach." Said Prof. T.N.Krishnamurti, the paper's lead author and a TRMM scientist at Florida University. " Overall we were more interested in improving the three-day rainfall forecast skills. Our research has shown that the global , as well as the regional skills, using the multi-analysis superensemble, are higher with TRMM research data."

These forecast results are based on five experiments each during Aug/1 to Aug.5, 1998. The skill or accuracy was higher over all tropical regions. Scientists attribute this success to a combination of improved analyses available from the availability of accurate rainfall estimates over the tropics from the TRMM satellite. Presently, only two % of the area covered by TRMM is covered by ground-based radars, said Dr. Christian Kummerow, TRMM project Scientist at NASA's Goddard Space Flight Center, Greenbelt Md. TRMM has produced continuous data since December 1977. Tropical rainfall, which falls between 35 degree north latitude, comprises more than two-thirds of the rainfall on Earth.

(The Hindu, 20/01/2000)

(Data Processing/ Surface Water Hydrology, General)

IE(55) Water as a Catalyst

The Southeastern Anatolian in Turkey is not just a water scheme but a regional development program for what was once the most backward part of the country. B.G.Verghese writes on the lessons India has to learn from the Turkey examples.

A recent visit to the Southern Anatolian Project (GAP) in Turkey illustrates the point. This project envisages the harnessing of the Tigris and Euphrates rivers through a combined cascade of 22 dams to irrigate 1.7 m ha of land and generate 27 bn kwh from an installed hydro-electric capacity of 7500 MW.

The approach is holistic, bottom-up, participatory. The GAP administration is charged with conceptualizing, implementing, managing and maintaining the entire system with the emphasis being on human development and sustainability.

(Indian Express, 20/01/2000, Project(Turkey))
(Water Management, General)

IE(56) Water, Water, Everywhere

Water Supply Minister Narottam Patel believes the water crisis in Saurashtra region is a myth. And he actually proved it during a visit to Rajkot. As Patel and his officers made a presentation for the benefit of journalists, the big screen at the conference room came alive with impressive statistics, figures of demand and supply, projections for coming months – all falling in place to show that there was plenty of water. Naturally, the minister looked happy: water scarcity was a myth and he had proved it. But hardly had he finished when a barrage of questions stunned him. " Where is the water? Why are taps dry? Have you seen the reservoirs outside the town? If you have water, why don't you give it? Why don't you come and live here for few days? Recovering after a while, Patel said " We will give you water.

(Indian Express, 17/01/2000)
(Water Crisis, Gujarat)

H(74) watershed Atlas For Rajasthan Developed

A "watershed atlas" for Rajasthan has been developed by the state's science and technology department to aid the implementation of land and water conservation schemes in the state.

Prepared by the Jodhpur-based State Remote Sensing application Center, the atlas contains details of about 13 rivers in Rajasthan, their catchment and sub-catchment areas along with their identification and demarcation, information that will help prepare "watershed" -based schemes and their monitoring, science and technology department sources said here yesterday.

The sources said the atlas was made keeping in view the requirement of macro and micro watersheds in Rajasthan.

Though all-India land utilisation organisation had prepared a watershed atlas of India, it was at a very small scale, having as its lowest unit a sub-watershed with an areas of more than 15,000 hectares, while the lowest unit in Rajasthan was less than 1000 hectares, sources said.

In Rajasthan the macro and micro watersheds have been described according to priority, keeping in mind land utilisation and improvements therein, the sources added this watershed map was prepared at a scale of 1:500,000 with the help of geo-satellite imagery and air photographs.
(The Hindu, 15/01/2000)
(Watershed Hydrology, Rajasthan)

H(75) T.B. Dam: Steps To Offset Loss Of Storage Capacity

The Chief Minister, Mr. S. M. Krishna, has said that the Government is thinking of constructing balancing reservoirs on either side of the Tungabhadra reservoir to store excess water during monsoon in order to compensate for the loss of storage capacity in the Reservoir.

Talking to press persons here today, he said that the storage capacity of the T.B. reservoir was being reduced year by year owing to heavy siltation from the catchment area . The capacity was being reduced by one tmc ft. every year and now stood a 100 tmc ft. against the original capacity of 133 tmc ft. There was an urgent need to compensate for this loss of storage as the situation in the command areas in Raichur, Koppal and Bellary districts was becoming critical due to shortage of water for irrigation.

However, the project needed huge investment. The Government would order a detailed technical survey to locate feasible sites on either side of the reservoir.
(The Hindu, 15/01/2000)
(Dam Hydrology, Karnataka, Tungbhadra Dam)

H(76) AP, Karnataka Squabble Over Krishna Water

The utilisation of 330 tmc ft. of the Krishna water under Scheme B of the Bachawat Tribunal Award has become a fresh bone of contention between Karnataka and Andhra Pradesh.
The website of the Andhra Pradesh government, reportedly claiming that it had plans to spend Rs.33,000 crore for the completion of non-going projects in the Krishna basin for the utilisation of surplus water.

Karnataka has made a fresh allegation that the website had confirmed that it had launched eight irrigation projects in the Krishna basin for utilisation of all surplus water.

He appealed to the Prime Minister to constitute an inter-state authority for the execution of Scheme B for utilisation of surplus water among Karnataka, Andhra Pradesh and Maharashtra. The tribunal under Scheme B, allotted 2,390 tmc ft. on the basis of 50 per cent of dependable flow, Thus, 330 tmc ft. was treated as surplus water.

The Karnataka Government had drawn the attention of the Union government that such a rider was not imposed by it on Andhara Pradesh's unapproved projects.
Maharashtra had originally supported the height of the almatti dam at 524.256 meters on July 11, 1997. But one year later, it changed tack on the ground that increasing the height of the dam would result in submersion of its territory.

To allay its fears, the Karnataka government got a study done by experts of the Indian Institute of Science, Bangalore, who opined that any submersion following the construction of the Almatti Dam and Hippargi barrage would be

confined only to Karnataka territory and not to areas in Maharashtra. Karnataka infect had planned the construction of the Almatti dam at a height of FRL 524.256 meters under the UKP way back in 1968 in 1968 for the creation of both irrigation facilities and hydro-electric power generation. When Scheme B was put into operation, the State had to step up its irrigation facilities for utilisation of its share of surplus water.

For Karnataka, the almatti reservoir was the only storage available for utilisation of its share of surplus water. Since inception the stand of Karnataka was consistent.

Interestingly, the Planning Commission committed in writing that it had no objections to Karnataka building the Almatti Dam to a height of 524.256 meters. The Director of Gates Division of the Central Water Commission, in a letter dated July 4, 1996, consented that the gates will design at FRL 524.256 meters.

The Hydrology Directorate of the Central Water Commission informed the State Government that it had cleared the hydrology aspects of UKP Stage II.

According to Karnataka, Andhra Pradesh's Telgu Ganga project, which was being executed for utilisation of 29 tmc ft. of water had not received clearance from the Center. Karnataka had objected to its over-sized canal network. According to it, it had the potential of utilising over 300 tmc ft. of water annually.

Karnataka is likely to face a severe law and order problem if two political leaders of Gulbarga district, Mr. Vaijanath Patil, and Mr. Hanumantha Rao Desai, decide to carry out their threat that about 50,000 farmers would perform "kar seva" for increasing the height of the Almatti Dam to FRL in February as part of a planned agitation.

(The Hindu, 13/01/2000)

(Inter-State Water Transfer, Andhra Pradesh and Karnataka, Krishna River)

IE(57) Snowfall Cripples Life in North

Normal life was disrupted at several places in North-West Region today following moderate to heavy snowfall in high and mid-hills in Jammu and Kashmir and Himachal Pradesh and rain in lower hills in the two states and plains of Punjab, Haryana and Chandigarh.

In Srinagar and its adjoining areas, the snowfall ended a long dry spell.

(Indian Express, 13/01/2000)

(Mountain Hydrology, Jammu & Kashmir)

H(77) NBA Wanted to Capture the Dam

The agitation today at the Maheshwar dam site on the Narmada in Madhya Pradesh by NBA activists, including novelist and social activist, Ms. Arundhati Roy, began from the early hours of the day.

The activists – around 400 of them had managed to break the prohibitory orders by forming small groups and closing in from all sides they could reach the pithead of the Maheshwar dam close to jalod village near Maheshwar.

The NBA wants all work on the Maheshwar dam stopped until the Government reworks the cost-benefit analysis to establish the economic viability of the project and shows the actual availability of cultivable land and other

arrangements to establish the real possibility of the rehabilitation of the affected people.

(The Hindu, 12/01/2000)

(Dam Hydrology, Madhya Pradesh, Maheshwar Dam)

H(78) An Irrigation Project Languishing For Decades

The Maskinala medium irrigation project in the Krishna Basin in Raichur District in Karnataka proves to be a costly affair when its irrigation potential is compared with the funds spent on it. The project is incomplete even after Rs.27 crore has been spent on it, and it needs more than Rs.7 crore to complete it.

The facts are surprising . After its completion the project is expected to irrigate only 7,416 acres in Lingsugar taluk. It has become a gamble in the hands of the Government, the bureaucracy and contractors . For the last 23 years, none of them has shown any interest to complete this project.

It was cleared in 1976 with administrative approval for Rs.311 crore. The inordinate delay in executing it has cost the State dearly. The project cost was revised to Rs.1430 crore in1985-86, Rs.2395 crore in 1998-99. Its cost now is Rs.3429 crore.

The Maskinala project is one of 13 projects prioritised under Group "A". It envisages the construction of an 813.83 m-long dam across the Maskinala river at Maralandinni village near Lingsugur to irrigate a command area of 3,000 hectares on either side with a 10-km long canal on the left and an 11.5km long canal on the right.

However the contractor suspended the work in 1996 owing to lack of funds. In November 1996 the work was allotted to R. S. Shetty and company in Hubli on render basis. The firm promised to complete the project within 15 months. However, till March 1997, the work did not commence as the Irrigation Department failed to clear the previous measurements and hand them over to the new contractor. The Government arranged some funds with NABARD assistance, which put a condition that the project should be completed within 12 months.

According to NABARD, the project could have been completed by March 1998. However, the alleged nexus between the contractor and the Irrigation Department encouraged the contractor to maintain a show rate of progress and work was suspended on several occasions for some reason or the other.

The delay in releasing funds for clearing the pending bills also added fuel to the fire. The contractor finally suspended work in August 1998 demanding a revision of scheduled rates.

Meanwhile the Irrigation Department faced a technical problem while providing the approved designs to the contractor to proceed with the construction of the wing and ring walls on the right side of the dam. The department was not able to finalise the designs for laying the foundation here.

Matter was referred to experts in the Central Water and Power Research Station(CWPRS), Pune, to recommend sand bed treatment after conducting a test on the nature of the earthen portion. The issue was kept pending for almost a year as the Irrigation Department could not furnish the constancy fee in time to the CWPRS.

Yet the contractor was asked to speed up the work on all other portions till the Department provided him the approved design for bed treatment in the

right side of the dam. The progress of work was slow due to shortage of funds to clear pending bills.

The contractor also brought pressure on the department to revise the scheduled rates due to the delay in providing him the design to construct the wing and ring walls on the right side of the dam. He also threatened to suspend work and approach the court if his demands were not met.

Recently, on receipt of the design from the CWPRS, the work on right side of the dam commenced. The work on all five blocks of the spillway bodywall, including the abutment block and training walls on either side of the dam, has been completed. The excavation of canals on either side of the project, including the construction of cross drainage's and field channels, has almost been completed. However, about 50 per cent work on the chute block in the dam is yet to be done.

In October last, the Government further extended the time for completing the project till March this year after approving Rs.1.54 crore and Rs.10 lakh, respectively for the revision of rates in respect of the contract schedule and supply of steel gates by the Tungabhadra Steel Products Limited, Hospet. It also approved release of Rs.2.70 crore towards the construction of a diaphragm wall on the right side of the dam. But now the progress of work has come to a standstill as the State Government suspended release of funds pending a survey of the status of progress and funds spent.

(The Hindu, 11/01/2000)

(Dam Hydrology, Karnataka, Maskinala river)

H(79) Govt. Stand on Dam Height Endorsed

Political parties in Andhra Pradesh, including the Congress (I), have expressed solidarity with the Government on the State's fight against any increased height of the Almatti dam, and unanimously authorised the Chief Minister, Mr. N. Chandrababu Naidu, to take whatever appropriate steps required to protect the interests of the State.

The Major Irrigation Minister, Mr Mahadeva Venkateswara Rao, who spoke to the press after the meeting a long with the political leaders, projected the stand of the State government to finally allow the dam height up to 512 meters (above mean sea level) as approved by the Planning Commission to help Karnataka utilise 173 tmcft under the project as contemplated.

All members fully endorsed this adding "we in one voice, support whatever legal strategy is adopted by the Government". According to the Minister, the leaders said they had arrived at 512 meters as the "consensus height" considering the fact that Karnataka had executed or taken up six more projects in the Krishna basin apart from the existing seven barrages upstream of Almatti. These along with Almatti, with this height, will be sufficient to ensure the 173-tmcft utilisation for Karnataka. The names of the six "unauthorised projects" as provided later to the Hindu by Mr. Venkateswara Rao were Hirehalli, Feeder Channel to Ranikere, Markandeya, Bhima Lift, singatlur Lift Irrigation Scheme and Upper Thunga. (With the solid structure of the dam being 509 meters now, a height of only three meters is left for installation of the gates under 512-m height as against 15 meters under 524.256-m sought by Karnataka).

(The Hindu, 11/01/2000)

(Dam Hydrology, Andhra Pradesh, Almatti Dam)

HT(2) Urgent need to identify poisoned tubewells: Experts

International experts have recommended immediate identification of all arsenic contaminated tubewells in eight districts of West Bengal. They have also urged the earmarking of safe water as an economic reserve to fight the decades-long health hazard affecting millions of people.

Following remediation and advice of the affected population, it will be necessary to check that arsenic uptake has really fallen by periodic sampling and analysis of urinary arsenic levels. Among the various technology options, the core team felt that upgradation of traditional water sources and tapping arsenic free waters along with removal of the toxic elements from ground water were the best available.

(The Hindustan Times, 8/01/2000)
(Water Pollution, West Bengal)

H(80) SC Notice For Not Complying With Order on Yamuna

The Supreme court has issued notice to the Chief Secretary of Delhi Govemment asking why action could not be initiated against him for failing to comply with an earlier order banning discharge of untreated industrial effluents into the Yamuna river from November 1 last.

A bench comprising Mr. Justice B.N. Kirpal, Mr. Justice V. N. Khare and Mr. justice M.B. Shah, passed the order while rejecting an application by the government seeking extension of the November 1, 1999 ultimatum given by the court to the industries.

The court on September 13 fixed the November 1 deadline and had directed the government to ensure that no industry violated its orders. With effect from November 1, 1999, No industry will be permitted to discharge any industrial effluent which do not conform to the parameters prescribed by the Central Pollution Control Board into the river Yamuna directly or indirectly , the court had said.

Following refusal of the court to extend the deadline, the government had started enforcing the standards on discharge of effluents and has already closed down over 500 industries in the National Capital, official sources in the industry Ministry said.

The Government had sought time till September, 2000 to set up three common effluent treatment plants (CETPs) and time up to November, 2000 for individual industrial units to set up ETPs.

(The Hindu, 7/01/2000)
(Water Pollution /Industrial Effluent, New Delhi, Yamuna)

HT(3) Gujarat already in the grip of severe drought

Rainfall uptill now in the area has only been 148 millimetres (mm) compared to the normal of 550 mm. "If there are no rains in early 2000, we will have to migrate from the village," says Veljibhai Dhamsania, vice president of the Falla gram panchayat. "This is the worst drought I have ever seen in my life," says 48 year old Lasan Bhilwad of Rentia village in Dahod.

In Gandhigram village in Kachh district, the villagers have been suffering from over extraction of groundwater leading to ingress of saline water into the aquifer making it undrinkable. The village has constructed several check dams

but has now even taken a bank loan to build more. At present, Gandhigram gets its drinking water from government pipelines. The villagers are not sure that this water will last for long. So they are striking off on their own. This year, they irrigated 400 hectares, a lot of which was earlier barren.

All these examples show that capturing the rain can help Indians to meet their water needs even in drought conditions. But it will mean a serious effort to encourage and help rural communities to take water management in their own hands - to make water everybody's business. A major shift away from the current bureaucratic systems of water supply.

(The Hindustan Times, 06/01/ 2000)
(Drought Hydrology, Gujarat)

IE(57) Maharashtra Govt. Seals Water Park for Violating Forest Act

The Nishiland Water Park near Khalapur on the Mumbai-Pune road has been sealed for violation of the Forest Conservation Act. The Forest Department has alleged that the Forest Conservation Act was being blatantly violated since non-forestry activities were in full swing in the deemed forest areas.

(Indian Express, 06/01/2000 , Prafulla Marpakwar)
(Forest Hydrology, Maharashtra)

4.0 Concluding Remarks

For realistic estimates of actual changes in regional water availability, a number of improvements need to be made over these studies. For such studies, water resources planners, regional hydrologic assessments should include:

- In India, importance of reuse and recycling of treated sewage and industrial effluents has been realized on account of two distinct advantages – (1) reduction of pollution in the receiving water bodies; and (2) reduction in the requirement of fresh water for various beneficial uses. Reuse of municipal wastewater after necessary treatment to meet industrial water requirements has been in practice for quite some time in India. The size of installation varies from 120 cubic metres per day to as much as 2300 cubic metres per day. In some cases of tall buildings, sewerage is treated in the basement itself and reused as make up water in the building's air-conditioning system.

- Reuse of recycled water have to be practised extensively particularly in irrigation, horticulture and for rough industrial and even domestic (e.g. Toilet flushing, gardening) usages and will have to be the Agenda for Water of the 21st Century. The common man will now have to learn the science and art of preserving the quantity and quality of water and to use it optimally. The Indian Water Works Association, can take steps to help the country in this 'Water mission' by awareness amongst all the people.

- The Union water resources Ministry proposed the discussions with NGOs to chalk out a strategy for evolving effective ways and means for a nation-wide rain water-harvesting campaign. Sensing the need to conserve water, there must be some amendments to building by-laws making it mandatory for city building to have in-built provisions for water conservation. DDA has been proposed for water harvesting in-built provision.

- Privatization of Urban water supply and sanitation is a long felt need of the country to make the sector efficient, effective, reliable and self -sustainable. Water supply and sanitation services should be privatise in all states for better services. Several models of private participation successfully tried out abroad are available and could be selected and implemented here depending on their suitability.

- Ground water quality as well as surface water quality in every area of the state should be monitored time to time and try to

keep the standards alive. The treatment should be given for water deteriorated quality.

- While some of the larger municipalities are financially viable and are able to service their debts, most local authorities and utility boards are in financial disarray. In order to make water supply systems self-sustainable, the possibility of suitable tax or tariff structure should be worked out and levied on the beneficiaries for providing sewerage, sanitation, drainage and solid waste management facilities.

- Metering of water supply is desirable to minimize wastage and to maintain economic pricing of water.

- As such, there is a need to adopt low volume cisterns of capacity of 3-4 litres for flushing urinals and toilets in residences as well as public buildings/places.

- City level consumer forums may be set-up to keep a vigil on the water source to prevent possible contamination and make periodical reporting to the supply agencies for appropriate action well in advance. At the same time, awareness programmes on water conservation, wastage prevention, water quality, personnel hygiene etc. may have to be designed and implemented with the help of NGOs and neighbourhood committees.

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