

SR - 3/97-98

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



आपो हि ष्टा मयो भुवः

**NATIONAL INSTITUTE OF HYDROLOGY
JAL VIGYAN BHAWAN
ROORKEE - 247 667 (U.P.) INDIA**

1997-98

CONTENTS

NO.	DESCRIPTION	PAGE NO.
	List of Tables	
1.	Introduction	1
2.	Contents Layout	2
3.	The Statesman (S)	3
4.	Hindustan Times (HT)	19
5.	Times of India (T)	21
6.	Pioneer (P)	28
7.	Hindu (H)	50
8.	Concluding Remarks	102

List of Tables

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

Table 2: Hydrological Problems of Specific Basins versus Content Positions

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

S. No.	Topics	Content Numbers
1.	Ground Water Hydrology	S2,S3,S12,S17,P3,H10,H23,H52,H56,H60, H61
2.	Water Crisis	S1,S6,S14,T1,T6,P10,P20,H2,H19,H58,H59
3.	Land/Soil Erosion	S10, P18, H50
4.	Drought Management	S7, P12, P20, H8, H16, H51, H65
5.	Water Pollution (through Industrial effluent)	S1, S4, S11, P11, P13, P21, P26, H37, H54
6.	Flood Hydrology	T2, H18, H20, H24, H26, H27, H34, H43
7.	Water Policy/Bill/ Water Management	S2, S19, T8, P24, P25, H3, H5, H23, H30, H42, H48, H63, H74
8.	Environmental Hydrology.	S10, S18, T5, P4, P8, P9, P15, P17, P23, H4, H9, H45, H48, H68
9.	Recycling of Water	S1
10.	Forest Hydrology	S9, P5, P7, P9, H9, H47, H67, H68
11.	Irrigation	S3, T3, H41
12.	Rem.Sensing & Data Collection	P12, H65, H73
13.	Drainage/Dredging Hydrology	S8, H46, H74
14.	Flash Flood	H28, H31, H32

15.	Waste Water Treatment Plant	H64
16.	Interbasin Water Transfer	H7, H22, H25, H39, H69
17.	Marine Pollution	P16
18.	Potable Water	P1, P22, P27, H6, H29, H36
19.	Water Quality	S4, S6, S13, HT1, P1, P6, P23, H12, H13, H29, H55, H62, H70
20.	Nuclear Hydrology	H57
21.	Climatology	H14, H15
22.	Waterlogging/ Soil Salinity	H17, H21, H33
23.	Water Harvesting	P25, H35, H58, H72
24.	Lake Hydrology/ Lake Pollution	S16, S18, P2, P4, P28, H11, H38, H44, H53, H66, H71
25.	Water Availability	S15, T7, P14, P18, H1, H5
26.	Environmental Hydrology	S10, S18, T5, P4, P8, P9, P15, P17, P23, H4, H9, H45, H48, H68

Table 2: Hydrological Problems of Specific Basins versus Content Positions

S.No.	Specific Basins	Content Positions
1.	Andra River, Himachal Pradesh	H28
2.	Aravali Hill Project, Haryana	H67
3.	Bhadar River, Gujarat	P11
4.	Bhaki Canal, Haryana	S3
5.	Bhima River, Maharashtra	H24, H26
6.	Bhopal Lake Project, Bhopal	H71
7.	Brahmaputra River, Assam	H57
8.	Cauvery, Karnataka	H22, H69
9.	Chandil Dam, Bihar	H31
10.	Chilka Lake, Orissa	S8, P28
11.	Dal Lake, Jammu & Kashmir	S16, T5, P4, P17, H49, H53, H68
12.	Danube River Dam, Black sea	H40
13.	Farakka Dam	H7
14.	Ganga Basin, U.P.	S11, H55
15.	Ganga & Teesta River, (Indo-Bangladesh)	H38
16.	Godavari, A.P.	H16
17.	Gomti Basin, Lucknow, UP	P1, P13, P26
18.	Kandaleru-Ooondi Canal, Channai	H1
19.	KELO Reservoir Project, (MP)	H41
20.	Khajjiar Lake, Himachal Pradesh	S18
21.	Kodai Canal Lake, Karnataka	H11
22.	Kolar Reservoir (Bhopal)	H19

23.	Kolleru Lake, A.P.	P2
24.	Krishna River (Karnataka)	H34
25.	Krishnaraja Sagar Dam, Mysore	P19
26.	Majuli River Island, Assam	H50
27.	Nainital Lake, U.P.	H38
28.	Narmada Basin, M.P.	S13, T4
29.	Peninsula River	H3
30.	Pushkar Lake, Rajasthan	H66
31.	Ranchi Lake, Bihar	H45
32.	Rugdhi Canal, Rajasthan	H37
33.	Tungabhadra River, Karnataka	P21
34.	Wullar and Manasbal lake	H44
35.	Yamuna Basin, Delhi	S10, P9, P15, P23, H2, H58
36.	Yamuna Basin, Haryana	P6, P14, H54

INTRODUCTION

Dissemination of any news concerning all of us, particularly, the news about water resources is of utmost importance due to the fact that availability of good water has become the most critical factor for any development activity and for stepping into the next millennium with confidence. The various hydrologic problems of India which vary over space and time are by and large known. But, their occurrence, severity, long term and short term impact on our various development processes, environment, and economy, are not always visualised.

The hydrologic events that were occurring across the length and breadth of India are the manifestation of the hydrologic problems and an awareness of the same will definitely be congenial to be the rational starting point to mitigate these. With this thing in view, the hydrologic information and news available from the print media and various government agencies mostly for 1997-98 are collected and compiled in this report state-wise and problemwise and river basin-wise for the whole country.

News are categorised in twenty-six sub-sections according to problems faced by the country. Also arranged all the news statewise and river-basin wise. The news have been collected from the five national newspapers. Further for the convenience of the readers, a matrix is provided amongst the problem and the position index of the contents with respect to the problem in the report (Table-1). Table-2 serves as a matrix to indicate the river basins where the different problems have taken place. As such, readers can easily go through the reported hydrologic events according to 26 classified problems statewise and river basin-wise.

It is an attempt to cover all the important hydrology and water resources related news and events to the extent possible. However, the present report may be taken as an illustrative compilation of the hydrological information and news and be referred.

CONTENTS LAYOUT

**News Numbers used
by Author, here , 'S'
stands for 'Statesman'**

Title taken from Newspaper

S3). HARYANA WATER-TABLE SINKS FURTHER:

The Chief Minister, Mr Bansi Lal, and the Union Agriculture Minister, Mr Chaturanan Mishra, will participate in a two-day seminar on management strategies for controlling water-logging, salinity and falling water-table problems in Haryana being organised by CCS Haryana Agricultural University here from 5 December.

**Contents of
the news**

The Vice-Chancellor, Prof. J. B. Chowdhury, said large-scale introduction of canal irrigation in Haryana following the completion of the Bhaki canal system during early '60s had led to the rise in ground water-table in half the areas of the state. The areas experiencing a rise in the water level were primarily yielded brackish and saline ground water unsuitable for irrigation.

Prof. Chowdhury said during the past three decades, the water-table in the canal-irrigated areas in Haryana had risen at a rate on 30 cm to 100 cm annually and nearly 473,400 hectare had already come within 3 cm from the ground surface. A recent study has revealed that in the next three decades the area under critical water-table depth would register a four-fold increase if no corrective measures are taken.

(The Statesman, 28 Nov. 1997, Statesman News Service.)

(Irrigation/G.W.H., Haryana, Bhaki Canal)

**Name of the
Newspaper**

Source

Date of the Publication

Related Place

Water body

Specified category under

Specified category under

Hydrological Problems(I)

Hydrological Problems(II)

Note: Similarly 'HT' stands for Hindustan Times, 'P' stands for Pioneer, 'H' for Hindu and 'T' for Times of India.

THE STATESMAN (S)

S1). INDIA ON BRINK OF ACUTE FRESH WATER CRISIS:

With the population of the country reaching almost one billion. India is poised to become a water-stressed region by 2025, the Minister of State for Environment, Mr. Saifuddin Soz, said here today.

He was speaking at the opening of the consultation on "Fresh Water for India's Children and Nature", a book by the World Wide Fund for Nature and the United Nations International Children's Education. The report says that 70 per cent of the water available in the country is polluted and about 73 million workdays are lost due to water-related diseases. It points out that nearly 44 million people are affected by water quality problems either due to pollution or the prevalence of fluoride and iron deposits. Intrusion of salt water or arsenic is also a cause of worry, it states. The fresh water crisis is not a result of natural factors such as droughts, but has been caused by humans. Huge amounts of water was wasted for irrigation of crops against the backdrop of outdated management and agricultural practices.

Depleting forest cover, particularly in catchment areas, neglect of traditional water conservation techniques and increased contamination of water sources was also leading to a reduction in supply of water. The absence of rational pricing policy, lack of norms for limiting abstraction of ground water resources and failure to encourage recycling of waste water all compounded the problem, the minister said.

He informed that the ministry had pointed out the need for modification of the National Water Policy which was announced in 1987 and which served to prioritise water for allocation. Some of the changes should include a proper pricing policy to be adopted by the states, pollution abatement works, utilisation of treated water for irrigation and striving to minimise transmission and distribution losses through proper lining of distributary channels.

(The Statesman, Delhi, 21 Jan. 1998, by S. News Service.)

(Water crisis/water pollution/recycling of water, India, -)

S2). GROUND WATER PLAN YET TO TAKE OFF

Ground water, though a critical natural resource, has been one of the most under valued and neglected areas in the country. Though almost a year has passed since the Supreme Court order directing the Central government to form the Central

Ground Water Authority, there are no signs of the body being put into shape.

Each state, it is proposed, will have a GWA, which will stipulate terms for ground water use in areas notified under the Act through the state government or the Union Territory. An area can be notified to ensure its protection against abuse of ground water if the ground water level is detected to be sinking below the acceptable level. However, it is not clear how the acceptable level will be determined and by whom. The main points of criticism against the model Bill are as under:

- i) The Bill makes an exception in cases of wells sunk for irrigation, which is one of the principal uses of the ground water. The GWA should be informed of all wells sunk even for manual usage.
- ii) The maximum amount of penalty under Section 17 is too low. At Rs. 5,000 for the first offence of illegal sinking or use of wells, it would be peanuts for tanker owners.
- iii) Only the GWA or a person by its written consent is authorised to take legal action under the Act which negates the very purpose of benevolent regulation.
- iv) There is no provision in the Bill for making the GWA fend for itself which should be done by levying charges for permits, use of ground water, etc.
- v) The GWA lacks teeth. Though it provides for revoking of permits, it has no power to render a well unusable which is crucial for its efficacious functioning.
- vi) Bad land use can adversely affect ground water recharge capabilities. The Bill proposes no checks against this.
- vii) Over and above everything, the GWA is not vested with powers to prevent ground water pollution, to recharge the quantum extracted, to measure the water levels. All these perceived discrepancies can go a long way in aggravating ground water depletion.

(The Statesman, 26 Nov., 1997, by S. News Service.)

(G.W.H./Water Bill, India , -)

S3). HARYANA WATER-TABLE SINKS FURTHER:

The Chief Minister, Mr Bansi Lal, and the Union Agriculture Minister, Mr Chaturanan Mishra, will participate in a two-day seminar on management strategies for controlling water-logging, salinity and falling water-table problems in Haryana being

organised by CCS Haryana Agricultural University here from 5 December, 1997.

The Vice-Chancellor, Prof. J.B. Chowdhury, said large-scale introduction of canal irrigation in Haryana following the completion of the Bhaki canal system during early '60s had led to the rise in ground water-table in half the areas of the state. The areas experiencing a rise in the water level were primarily yielded brackish and saline ground water unsuitable for irrigation.

Explaining the rise in water levels, he said Haryana, with its location between the Himalayas on the north-east and the Thar on the south-west, bestowed mainly inland drainage conditions or an extensive closed basin. A topographic depression existed in the centre with its axis passing through Delhi, Rohtak, Hissar and Sirsa on the regional scale and thus the ground water moved towards this depression. The state also formed water divide between the Indus and the Ganges basins. Therefore, losses from the irrigation system, conveyance and water application, unfavourable geo-hydrological conditions and poor ground water level were the major factors contributing to the rise in the water levels.

Prof. Chowdhury said during the past three decades, the water-table in the canal-irrigated areas in Haryana had risen at a rate on 30 cm to 100 cm annually and nearly 473,400 hectare had already come within 3 cm from the ground surface. A recent study has revealed that in the next three decades the area under critical water-table depth would register a four-fold increase if no corrective measures are taken.

(The Statesman, 28 Nov. 1997, Statesman News Service.)

(Irrigation/G.W.H., Haryana, Bhaki Canal)

S4). HIGH NITRATE CONTENT IN DELHI'S WATER:

For the 10,000-odd people living in the J. P. block of Pitampura area, about 30 handpumps are the main source of drinking water. But the test conducted by a group of students from a nearby school, trained under a special programme, found that the presence of fluoride is very high in the water drawn from these tubewells.

A study conducted by students from 12 schools under a programme, the Delhi Environment Action network, found that ground water sources showed high nitrate, chloride, fluoride, ammonia contents in certain areas. Delhi is facing a major environment problem due to phenomenal growth of population, travel demands,

industrialisation, air pollution and mounting heaps of solid waste.

(The Statesman, Delhi, 5th November, 97)

(Water Quality/ Water Pollution, Delhi, -)

S5). VIABILITY OF BIG DAMS TO BE SCRUTINISED:

In an interesting development, the first ever independent review of the costs and benefits of large dam projects will be done by the World Commission on Dams, which will be formally launched by November 1997.

A South African Cabinet Minister, Prof Kader Asmal, will chair the new eight-member commission, whose agenda is to conduct a two-year review of the efficacy of large dams vis-a vis overall development. A report on its findings will be delivered by 2000. Among Indian projects, the Sardar Sarovar Project and the Tehri Dam are two projects to come up for review.

(The Statesman, 25 Oct.97, By Statesman New Service.)

(Dam Construction, India, -)

S6). SURVIVING 50 YEARS OF GOVT. INACTION:

Ladakh remains a region of geographical isolation where time has stopped in its tracks. The hard facts of life are borne out by these revealing statistics of the situation in the capital city. Tap water supply caters to a mere 10 per cent of the population, the rest depend on tankers. But severe pollution has caused several hepatitis and other gastro-intestinal infections.

Water from a stream is diverted into a channel, fed subsequently to the turbine and connected to an alternator to generate electricity. But it is water supply which makes for a gloomier picture. The only source of water is the stream that flows down from the Khardungla glacier via Ganga. This water is heavily polluted and dangerous to drink. An alarming number of hepatitis-B cases have been reported, and gastro-intestinal diseases are endemic.

Cholera broke out in the area not too long ago. Water so essential to life - is an increasingly unavailable commodity in Ladakh. In recent years, some independent organisations have initiated the installation of hand-pumps in villages. Taking the cue only after the success of the experiment, the state government has promptly

requisitioned several thousand handpumps. However, as of date, tankers remain the main source of water in Leh and the rest of the region, for the crying lack of sustainable alternatives.

(The Statesman, 14 Sept, 1997, by Deepshikha Ghosh.)

(Water crisis/Water quality, Ladakh, -)

S7). MAJOR PART OF ANDHRA DROUGHT-HIT:

Andhra Cabinet, declared 755 of the 1110 mandals in the state as "drought hit" in the first phase and is looking towards the Centre to bail it out from yet another natural calamity.

(The Statesman, 14 Sept., 1997 by S. News Service.)

(Drought Management, Andhra, -)

S8). DREDGING CHILKA:

The dredging of Chilka lake in Orissa, Asia's biggest brackish lagoon will be taken up in October, 1997 after the current environment assessment study is over. The State Minister for Environment Science & Technology, said.

(The Statesman, Delhi 19th August, 97.)

(Dredging Hydrology, Orrisa, Chilka lake)

S9). GREENING OF JHABUA - AN UPHILL TASK:

One of the poorest districts in India, Jhabua, located at the south-western tip of Madhya Pradesh, is a text-book example of environmental havoc wreaked by man in a region blessed with thick forest cover and rich natural resources.

On paper, 25 per cent of the total 6,782 square kilometres of the district is currently under the forest cover, but the actual scene is horrific. Here are some staggering figures:

- The district is now left with only 4 per cent forest cover.
- thirty-six per cent of the total land has lost its top soil and therefore, been rendered completely useless for any agricultural or commercial use.
- sixty-five per cent land has become thoroughly degraded. The district now seems a wasteland with its undulating terrain strewn with pebbles and boulders,

its hillocks appearing bald and barren after being stripped of trees and vegetation and its water table consistently plummeting.

The per capita foodgrain production in this predominantly tribal district is merely 148 kg which is well below the State average of 208 kg. One major reason for the current situation is simple. With the rampant felling of trees and consequent deforestation, the water harvesting went haywire over the years, which resulted in massive soil erosion.

Given Jhabua's peculiar spiralling terrain, the water from the rains hitting the top layers of the denuded high lands becomes unstoppable as the forest cover which earlier arrested the flow is no longer there. Thus, flowing down the gradient towards a nallah, and further down into a river, the water sweeps away soil particles, in its wake. Consequently, a large chunk of the total agricultural lands were devastated over the years in the district where 97 per cent of the total population is dependent on agriculture.

This process, continuing for a number of decades, culminated in "diversification" in early '60s and the danger of Jhabua becoming like desert parts of Rajasthan loomed large. Amidst this dismal scenario, the Madhya Pradesh government launched a programme called Rajiv Gandhi Watershed Development Mission in August 1994 to conserve and increase soil and water resources in order to recharge the ground water-level and boost agriculture production to provide sustainable livelihood with the help of various voluntary organisations and local people in drought-prone parts of the State.

The approach adopted for the programme is "top-down" so that water could be harvested and stopped as far as possible from sweeping soil at the upper layers first. Some techniques being used for this include digging up trenches along the contours of an area, setting up check-dams and bunds with the aid of local resources like pebbles and boulders, plantation of soil-binding plants; etc.

Currently, 124,000 hectares out of the total 687,000 hectares have been taken up under the watershed mission in the Jhabua district even as 1 million hectares are being treated under the programme in 42 districts across the state.

(The Statesman, 5th August, 97.)

(Forest Hydrology, Madhya Pradesh (Jhabua District), -)

S10). TERI STUDY PORTENDS ENVIRONMENTAL DISASTER - Acute Water Scarcity Predicted in Jamuna by Year 2050:

Cohesive efforts would be needed from public as well as private agencies if India has to be saved from a major environmental disaster, says a study by Tata Energy Research Institute (TERI).

Green India 2047, a project undertaken by the TERI, states that task of managing 44.98 crore tons of coal ash and up to 60 per cent of present quantum of paper entering the rivers would impose serious and physical infrastructure burden.

The study estimates that a flow of at least 58 cubic metres of pure water per second would be needed in the Jamuna basin to dilute the treated wastes to meet desired stream quantity. Considering the present flow of 5 cubic metres per second, the task at hand is gigantic.

At present, the water table of the Jamuna is falling at the rate of 0.15 metre per year. If the present decrease continues, the basin would continue water stress by the year 2025 and acute water scarcity by 2050.

In 50 years the renewable fresh water resources per capita had fallen from around 6,000 cubic metres per year to 2,300 in 1997. The study estimates that by the year 2017, India would be water stressed as per capita availability would reduce to 1,600 cubic metres by then.

Keeping in view the demand of water for irrigation, domestic purposes and industry, it is believed that demand would outstrip the availability.

In certain areas between Pennar and Kanniyakumari, the availability of water is as low as 400 cubic metres per person per year. Further, the proliferation of tube wells from 360,000 in 1947 to 6 million had disturbed the ground water situation in Punjab and Haryana. In 12 districts of Punjab and three of Haryana, the exploitation of ground water exceeds its recharge.

The study also estimates a catastrophic increase of land affected by soil erosion by the year 2047 would be 200 million hectares from the present 166 million hectares. In addition about 39.6 million hectares of land would be water-logged by the year 2047, up from the present 12.7 million.

Keeping in view the rapid increase in urban population, the project estimates that an additional land of 10 million hectares would be needed by the year 2047 to

accommodate this increase. And to meet the food requirements of the additional population, another a million hectare of land would have to be brought under cultivation.

Another 22 million would be needed to meet the government guidelines for forests and all this could be done if the wasteland management is done properly as about 24 million hectares, in India, is fallow and more 15 million hectares is cultivable wasteland.

The degradation of land would lead to an economic loss of Rs.8,900 crore to Rs. 23,200 crore in the present year, reflecting a loss of 11 to 26 per cent of annual agricultural loss.

Erosion had rendered 118 million hectares or 36 per cent of the total land of the country uneconomical to cultivation because of a significant loss in productivity. Erosion by water and air were the most important contributors to loss of land.

(The Statesman, 4, August, 1997 by S. News Service)

(Environmental Hydrology/ Soil Erosion, Delhi, Jamuna basin)

S11). GANGA: NOT SO PRISTINE ANYMORE:

Ganga Action Plan (GAP) launched by the Centre in 1986 with the aim of cleaning Ganga in the badly polluted stretches of Uttar Pradesh, Bihar and West Bengal has allegedly still not been able to achieve its goal in making the Ganga water fit for bathing.

The GAP contemplates improving the Ganga water quality through schemes of interception, diversion and treatment of municipal sewage (core sector schemes) in class one cities located on its banks in U.P., Bihar and West Bengal and other schemes aimed at controlling pollution from human defecation at ghats and banks of the river, throwing of burnt and half burnt bodies into the river and washing of cattle on the ghats (non-core sector schemes).

As much as Rs. 300 crores have been spent in Phase I of GAP. The Sankat Mochan Foundation (SMF), a Varanasi-based NGOs and a nominated member of the Divisional Task Force of the GAP has been working for the cause of cleaning Ganga since 1982 and runs Swacha Ganga Campaign. The Foundation's work has been recognized by the UNDP and it conferred Global 500 Roll of Honour on the

Foundation's president, Professor Veer Bhadra Misra, in Rio in 1992. According to SMF's studies, Ganga remains polluted even after the completion of the first phase of GAP. On the basis of the elaborate tests conducted in the Swatcha Ganga Research Laboratory for water testing, the SMF has proved that even today the BOD of Ganga water in the religious bathing area of Varanasi varies from more than 3 mg/l at the upstream end of the city to about 25mg/l at the downstream end of the city (confluence of Varuna and Ganga) and faecal conform-index of the bacteria - at these points varies between 70,000 mpn/100 ml and 1.5 million mpn/100ml.

According to Professor Misra, the limiting BOD and faecal coliform for river water are equal or less than 3 mg/l and 500 mpn/100 ml respectively. The test results have shown that Ganga water in Varansi is polluted and 60000 people, who take holy dip in the river every day and those who receive Ganga water for drinking are forced to live in an unhygienic environment.

The findings of SMF is corroborated by the report prepared by a team of experts which was hired by the government to assess the performance of schemes completed under GAP and their impact on reduction of pollution load drained into the river. The report has been submitted to the Environment and Forests Ministry.

(The Statesman, 3, August. 1997.)

(Water Pollution, Uttar Pradesh, Ganga basin)

S12). WATER TABLE SHRINKING ALARMINGLY IN RAJASTHAN:

Over-exploitation and indiscriminate use of water, mainly because of increasing agricultural activity, is creating serious problems in the entire Rajasthan, more so in the western and north-western parts. Experts believe that 'desertification', which is defined as land degradation in the arid, semi-arid, and dry sub-humid areas, is increasing and the water-table is shrinking at an alarming rate everywhere.

The State government is preparing to enact a new piece of legislation which seeks to regulate extraction of water by individuals. According to the status report circulated along with the proposed Bill - Rajasthan Ground Water (Regulation) Bill, 1997 - the water-table has shrunk in 67 percent of the area of which 37 percent has registered a depletion of more than three metres in the past 10 years. Several fresh water aquifer have indicated a decline ranging from 10 metres to 30 metres, revealing

that withdrawal of water in these areas far exceeds the replenishment. The depletion rate around big cities is also critical - between one to two metres a year.

At some places, this has led to dramatic changes. The quality of water has changed. Fresh water wells are yielding saline water. The Rampura-Mathania zone in Jodhpur is an example. The quality and yield of famous Mathania chilli has fallen considerably. The soil has hardened because of residual sodium carbonate present in water and the salinity-alkalinity of soil has increased.

On the other hand, positive indications have come from many of the dry districts in the west. The water level has gone up in the western halves of Jaisalmer and Barmer because of good rainfall in the past eight years and less exploitation and limited cultivation. But the government is cautious in declaring them as potential zones. Good monsoon and chance discovery of new water zones have brought hope at some other places too. These pockets fall in Jodhpur, Jaisalmer, Barmer, Jalore and Churu districts. This has evoked interest in the existence of hitherto unknown aquifer, possibly palaeochannels.

In Dhorimanna panchayat samiti of Barmer, for example, digging beyond 120 metres to 150 metres has led to a fresh water zone. Though this had been indicated in 1984, modern technology has enabled people to exploit the resource only in recent years. Fresh reserves have been found in Roopsi village in Jaisalmer block which goes upto Brahmisar, an area of about 400 square km. It may continue down south. Fresh water is available upto 50 metres in this area, beyond which water is saline. Experts at the Ground Water Department think they have hit a confined aquifer since water gushes forth at a great speed when the top layer is pierced. Several artisan wells have been dug in these areas.

In Jodhpur, digging beyond 90 metres in Bapi salt producing area yields fresh water. At Balasar, fresh water is available at 190 metres. The water layer lying above is saline at both places. A part of Sujangarh Panchayat samiti in Churu has also yielded fresh water. Officials point out that these parts remained undiscovered because of the hard sandstone-limestone structure.

(The Statesman, 29 July, 1997 by Prasanna Mohanty.)

(G.W.H., Rajasthan, -)

S13). EFFLUENTS LAND NARMADA IN TROUBLED WATER:

Effluents discharged from two liquor-manufacturing units on the outskirts of Barwaha town in Khargone district have been wreaking havoc in river Narmada there.

A large number of fish have been found dead in a more than 10 metre stretch of the river off Barwaha up to the neighbouring towns of Mandleshwar and Maheshwar owing to discharge of toxic pollutants.

Officials of the Madhya Pradesh Pollution Control Board have also started probing the case. They have taken water samples from various sites along the affected stretch and sent them for elaborate tests. They are likely to file criminal cases against the management of the distilleries.

Fish die in large numbers in river Betwa owing to effluents from the Sehatgunj factory of Som Distilleries in Raisen district every monsoon. This issue, whenever it is raised in the State Assembly, some action is taken against the erring units for a few weeks. But again it is back to the status quo because of the blatant apathy and inefficiency on the part of the State Pollution Control Board.

(The Statesman, 9 July, 97, by Statesman News Service.)

(Water Quality, Madhya Pradesh, Narmada basin)

**S14). IF THE PLANET GETS DRY :- Dry days are round the corner .
Three decades from today, every third person in the
world will suffer from water scarcity, writes Parshuram
Ray**

Experts have estimated that 30 years from now approximately one-third of the world's population will suffer from water crisis. According to Sandra Postal, a renowned water expert. "A growing scarcity of fresh water is now a major impediment to food production, ecosystem, health, social stability and peace among nations. Each year millions of tons of grain are grown by depleting underground aquifer.

The paper titled "Dividing the Water, Food Security, Ecosystem Health and the New politics of Scarcity", written by Postel, states that there are nearly three million people who are living in different states in Africa which have severe water crisis. Many of them are already dependent on imported food grain.

Although fresh water is renewable, it is also finite. The land receives roughly

the same amount of water today as it used to receive when the first civilization emerged thousands of years ago. Use of water all over the globe has roughly tripled between 1950 and 1990, and now, stands at an estimated 4,430 cubic feet, 35 per cent of the supply. In the USA, 37 species of fresh water fish are at risk primarily because of the destruction and degradation of their habitats. Along with the Colorado River delta, the Ganges, Amu Dar'ya and Syr Dar'ya deltas are among those facing deterioration due to dam constructions and diversion of the flow of the rivers. The Aral sea has shrunk by three-fourths of its volume due to diversion from Amu Dar'ya and Syr Dar'ya. It has lost 20 out of its 24 fish species which used to support around 60,000 fishermen. As the world population increases by 2.6 billion over the next 30 years, and as consumption levels goes up, water crisis is bound to intensify. According to Sandra Postel, there are three major challenges on the water front securing a sufficient and sustainable supply of water for food production, arresting the decline of aquatic ecosystem and avoiding social unrest and political conflict as competition for water increases. Sandra Postel has suggested a number of preventive and curative measures. "More rational water pricing, carefully monitored water markets, setting of efficiency standards' and allocation of water to meet minimum requirements for human beings and the ecosystem are some of the policy tools and actions that are needed.

Also at the international level, new impetus is needed so that countries which are undergoing water crisis can negotiate water sharing agreement and establish mechanisms for joint river basins management. Only with such arrangements can tensions be resolved and benefits of more optimal management be realized. Policy planners have underestimated the influence of water scarcity on economic progress, food security, and regional peace and stability. Many are yet to realize that water problems can no longer be solved by engineers alone. The challenges water scarcity poses are complex and varied.

(The Statesman, 29th June , 97.)

(Water Crisis, India, -)

S15). QUAKE 'BOON':

The Jabalpur earthquake has proved to be a blessing in disguise for the people

of Tikamgarh in northern Madhya Pradesh. The people have faced no water crisis during the severe summer months this year as the water level in their wells and tubewells has risen in the wake of the earthquake.

Findings of a survey, conducted by Mr. M.S.V. Verma of the Regional Research Centre of the Jawaharlal Nehru Agriculture University, show that water level in six out of ten resources has gone up due to geological changes. UNI.

(The Statesman, 27th June, 97.)

Water Availability, Madhya Pradesh, -)

S16). CENTRE TO ASSIST IN RESTORATION OF DAL LAKE:

The Centre will make Rs.330 crore available to the Jammu and Kashmir Government to assist in its effort to restore Srinagar's famous Dal Lake to its pristine conditions. Mr. Saifuddin Soz, who was accompanied by the J & K minister for housing and urban development and senior officials, expressed dismay at the encroachments on the Dal, heavy silting and the abundance of weeds which has reduced the expanse of the celebrated lake.

During the extended phase of militancy in the State, the deterioration of the ecology of the Dal had assumed alarming proportions.

(The Statesman, 3rd June , 1997.)

(Lake Hydrology/ Lake Pollution, Jammu and Kashmir, Dal lake)

S17). DARK ZONES:

With fast receding ground water table in Rajasthan, the number of grey and dark zones in the State had become more than three times during the past 12 years. According to official figures, in 1984 there were just 33 grey and dark zones spread over 287 panchayat samitis in the State, whereas last year the number of such zones had gone up to 109.

(The Statesman, 21st May, 1997.)

(G.W.H., Rajasthan, -)

S18). REDUCED TO A GRIMY POND - Khajjiar Lake:

Khajjiar, with its sprawling meadows, surrounded by thick woods and dotted

by a small lake, is one of Himachal Pradesh most picturesque spots, but environmental problems coupled with descending of hordes of tourists here have affected the lake, where is already fast shrinking. In fact, in recent years the Khajjiar lake has been reduced to a virtual grimy pond.

According to an environmental scientist, one of the reasons for the shrinking of the lake is its ageing process, but this has been sped up by man-made reasons such as silting, overgrazing and the rapid growth of weeds due to pollution.

Also hectic tourist activity at Khajjiar has taken its toll over the years and ponies constantly plod and gallop across the meadows. Although vehicles are prohibited but often they drive in since the area is unmanned. Besides, many hotels and dhabas have sprung up at the edge of the lake adding to the pollution.

Some suggest that the only way to save the Khajjiar Lake from dying is by declaring the entire area a wild life sanctuary, as this will help reduce pollution and other adverse human activity.

(The Statesman, 13, May 97 by Statesman News Service.)

(Environmental Hydrology/ Lake Hydrology, Himachal Pradesh, Khajjiar lake)

S19). CENTRE EMPOWERS C.G.W.B:

The Centre has delegated more powers to the Central Ground Water Board, granting it the status of the Ground Water Authority, following a recent directive of the Supreme Court, according to the CGWB eastern regional director, Dr. S.P. Sinha Ray, reports PTI.

The new status will give more teeth to the CGWB, functioning under the administrative authority of the Water Resources Ministry, with regard to regulation of the ground water management as also recommending penal steps against the erring authorities, Dr. Sinha Ray said. The ground water authority has been constituted for the purpose of regulation and control of Ground Water Management and Development under the Environment (protection) Act, 1986.

Dr. Sinha Ray said the apex court directive came in the wake of a public interest litigation. He said the court asked the CGWB to conduct a study of ground water scenario all over the country. The National Environment Engineering Research Institute (NEERI) too was called upon to submit a report on ground water quality.

On the basis of the findings, the Supreme Court directed formation of the ground water authority to control the receding trend in ground water level, he said. The CGWB eastern regional director said that the authority would exercise all powers under the Environment (protection) Act, 1986, required for the purpose of regulation and control of ground water management and development.

He said modalities of formation of State-level bodies and delegation of powers were under process, adding that the CGWB's 16 regional offices in the country were asked to work in tandem with respective State governments to delegate the power of the authority.

(The Statesman, 29 April , 1997.)

(Water plan / Water Management, Delhi, -)

HINDUSTAN TIMES

(HT)

HT1). ARSENIC INFECTION THREATENS TRIPURA

After West Bengal and bordering districts of Bangladesh, Tripura is fast emerging as an arsenic affected State due to the rapid denudation of the underground water level and wanton use of deep tubewell in various parts of the State.

Disclosing this to newsmen, State Pollution Control Board officials said today that due to Tripura's close proximity to Bangladesh, particularly the arsenic affected Comilla and Sylhet districts, was one of the main factors contributing to the looming threat of arsenic infection.

A group of environmental scientists had carried out an in- depth survey in 21 selected villages to determine the extent of arsenic infection. The people of 19 of these villages were found to be consuming water contaminated by arsenic. Since the Comilla and Sylhet districts of Bangladesh bordering West Tripura's Sonapura, Bishalgarh and Khowai sub divisions have been found to be maximum affected, these officials said adding that the threat of arsenic infection looms large over other parts of the State, specially Belonia in South Tripura and Kailashawar in North Tripura.

Explaining the possible alarming situation due to arsenic infection, leading environmentalist and Head of the Department of Environmental Studies of Jadavpur University (West Bengal) Dipankar Chakraborty said in a seminar in the Agartala Press Club recently that the infection has assumed dangerous proportions in West Bengal. Regarding cure from arsenic infection, Dr. Chakraborty said that the School of Environmental Studies headed by him has invented a tablet which could completely neutralise all arsenic contents in water. He stressed the need for long term environmental planning at official level and generating awareness among the people and added that 'otherwise the threat of pollution in all forms would continue to grow'.

Dr. Chakraborty said, 'we could tap our vast wetlands comprising many lakes and ponds dotting the villages and this could check the practice of exerting our groundwater any more and scare away the arsenic menace'. It could not be ruled out that the green vegetables are not grown with arsenic infected water and it might seep in our system, Dr. Chakraborty observed.

(The Hindusthan Times, 14, October 97.)

(Water Quality, Tripura, -)

TIMES OF INDIA
(T)

T1). STUDY BLAMES MIDDLE CLASS FOR WATER SHORTAGE:

The current consumption of water in the city's middle class localities is 10 times more than that available from an average rainfall, according to a recent study conducted jointly by Physical Research Laboratory scientist, Sushil Gupta, and a prominent builder, Mayur Shah. The detailed analysis says that given the present situation, "only recharging of rain water will not be sufficient. We need to develop a new thinking on how to reuse waste water".

The study says: "Our reliance on the underground water resource has increased more than ever. About 30 years ago clean water was available at 60 feet, but now it is available at 300 to 400 feet. The rate of underground percolation is very slow. The water at 300 to 400 feet could be a water of the rains that took place 3,500 to 4,000 years ago. And if at that time it was all wilderness and the rains had chance to recharge, today the rain water travels from the roof of a house or a flat to the compound, from compound to the road, from road to the gutter lines, from gutter lines to river, from the riverbed to sea. Indeed, there is little chance to recharge".

The water from the deeper layers has "objectionable elements and minerals mixed in it which may be objectionable to health".

Suggesting a two-pronged-strategy to conserve and recycle waste water, the study advocates reviving the traditional underground "tanks" that would collect rain water from housetops. The "tanks" a source of drinking water, were discarded in the fast movement towards urbanisation, but need to be revived as the city administration has failed to promise continuous supply of tap water.

(Times of India, 1, July 1997, by Rajiv Shah.)

(Water Crisis, India, -)

T2). SILTATION POSES FLOOD THREAT IN BIHAR:

According to the latest report of the Bihar's water resource development department, because of its geographical reasons, Bihar has the most flood-prone area in the country. Over 56.5 per cent of the state's population is affected by floods. While singling out the population-wise flood-hit people in the state, the National Flood Commission (NFC) has also pointed out that of 68.80 lakh hectares flood-affected areas in Bihar, over 44,047 hectares of areas falls in north Bihar alone.

Although, short-term measures are being taken to strengthen the old embankments, which have out-lived their utility, heavy siltation in the rivers had been endangering all embankments.

"The day is not far when heavy rush of silted water from the catchment areas of Nepal will breach all the embankments, resulting in colossal loss to life and property", Mr. Singh said and stressed the need for taming all the rivers, originating from Nepal and Tibet by constructing reservoirs and high dams in cooperation with the Nepal government.

(The Times of India, 14, July 1997 by K.K. Singh.)

(Flood Hydrology, Bihar, -)

T3). NORMAL MONSOON MAY NOT ENSURE A GOOD CROP:

The experience of last year bears this out. Although the monsoon was normal and rainfall overall was more than expected, deficient rainfall in certain pockets led to a two-million-tonne loss in paddy production.

The forecast by the Indian Meteorological Department is that the total rainfall during the season (June-September) this year will be 92 per cent of long-period average (LPA). A monsoon is deemed "Normal" if rainfall is between 90-110 per cent of LPA. As such this will be the 10th successive 'normal' monsoon.

But this need not translate into a bumper harvest. For that, it is necessary that the monsoon arrives on time, is distributed evenly across regions, the dry spell between rains is not long and the rains do not end early, agricultural experts say.

"If the monsoon is delayed by 10 days, there could be a 10 per cent drop in paddy yield even if total rainfall in the season is normal," says Mr Bhatia.

(Times of India, 30 May, 1997.)

(Irrigation, India, -)

T4). QUAKE REOPENS DEBATE ON DAMS:

Although the Bargi dam, near here, was not affected by Thursday's earthquake, residents in the area are worried about the tremors experienced close to the dam.

The quake has rekindled concern about the construction of dams in seismically

active areas. The Narmada valley, on which the dam is build, is acknowledged as an activated rift zone. Shortly after the quake, speculation was rift about whether the quake was a result of the construction of the Bargi dam on the Narmada river.

The NBA has also pointed out that the construction of dams could itself be the cause of increased seismic activity has been acknowledged and documented both in India and other parts of the world. "The Jabalpur earthquake shows that even if the dam is safe, the seismicity induced by the reservoir can play havoc with surrounding areas," says Sripal Dharmadhikary of the NBA.

The reactivation of the rift along the Narmada valley is solely responsible for the quake, he reiterated. "There was an earthquake in Jabalpur in 1903, much before the dam was build," Mr Negi pointed out.

He also ruled out the possibility of quakes destroying dams and endangering nearby settlers. "No concrete dam in the world has been destroyed by an earthquake so far. Even China, which is prone to seismic activity, has not been affected in this manner," he said.

(Times of India, 29 May, 1997 by Priyankar Kakodkar.)

(Dam Hydrology, Madhya Pradesh, Narmada Basin (Bargi Dam))

T5). POLLUTION, ENCROACHMENT MAR DAL LAKE'S BEAUTY:

"Problems of encroachment within and on the periphery of the Lake, silting and discharge of sewage and sullage by peripheral habitations were continuing even as a project to cleanse the Lake began way back in 1978," says a report of the Comptroller and Auditor General of India for 1995-96 tabled in the just concluded session of the Jammu and Kashmir legislature.

The cost of the project, earlier scheduled to be completed in 1983 has escalated to Rs. 332.55 crore in 1995.

Human interference by way of settlement on Lake shores, construction of earthen embankments, increase in number of house boats and denudation of the catchment area has caused shrinkage and pollution of the Lake, the report says.

A consultancy service group of experts from New Zealand was engaged under the Commonwealth Fund in 1977 to report on the existing conditions and recommend ways for improving water quality and surrounding environment.

(Times of India, 5, May 1997)

(Environmental Hydrology, Jammu and Kashmir, Dal Lake)

T6). WATER CRISIS:

Water Aplenty but less to drink in Asia.

(Times of India, Jan. 20, 1997.)

Urban water problem easy to resolve by diverting a small proportion of water meant for farming.

(Times of India, Jan. 13, 1997.)

Acute water shortage in Saurashtra districts.

(The Times of India, Dec. 25, 1996.)

T7). HIMALAYAN VILLAGES AWAIT TAP WATER:

If the drinking water project planned by a DehraDoon based non-governmental organisation Rural Litigation and Entitlement Kendra (RELK) for the village comes through, it will create a revolution of sorts in this sleepy countryside. RELK has taken up the scheme under World Bank aided Uttar Pradesh Rural Water Supply and Environment Sanitation Project covering 1,000 villages in Garhwal, Kumaon and Bundelkhand region. Most of these villages are located on high altitudes.

This massive project implemented with the help of 11 non-governmental organisations will be completed in four years. Satengal is one the the six villages selected by the RELK in the first phase of the project which covers 80 villages.

RELK chairperson Avdhesh Kaushal said, "The project will be implemented under the supervision of a team of retired Army engineers. We are also seeking technical guidance from the Geological Survey of India and the Wadia Institute of Himalayan Geology for recharging of the ground water in these villages".

When the project is completed, it would be handed over to a 11 member committee of villagers, he said.

The World Bank is giving 570 million which comes to about 84 per cent of the total cost of the project. The UP government is contributing six percent while the villagers would contribute 10 per cent of which one per cent would be in cash and the

rest in the form of labour. The World Bank has told the NGO's to plant trees and shrubs within one km radius of water resources, banks of the seasonal rivers. The NGO's also have to teach the villagers on health, hygiene, sanitation, environment and ecological aspects.

(Times of India, 21 October, 1996)

(Water availability, Himalayan region, -)

T8). WATER MANAGEMENT POLICY:

...AND ON A POLICY FOR WATER MANAGEMENT. BUT TO WHAT AVAIL?:

On Mr. M.C. Mehta's urging, early last month the Supreme Court asked for a quick report on the subject from the National Environmental Engineering Research Institute (NEERI) at Nagpur. They speedily complied and the government was told to use it as a basis for action. Nothing NEERI says is new; those in the know have been begging for action for years. In sum, in every state and, in every city, exploitation of below-surface water has been extensive and reckless, with no regard for what is sustainable and without any plans for replenishment. And it is getting worse, at an increasing rate.

According to the NEERI report:

* The water-table in much of the country is steadily sinking. The fall in a little over a decade has been two to four metres in many states. Delhi and the surrounding states are worse, the decline being four to eight metres in the decade after 1971, with a further fall in the decade after.

* Some of the results of such exploitation have been hazardous to public health. In Calcutta (an 8 metre fall in a decade) and the rest of the state, the exploitation has upset the geological balance, with arsenic from the bedrock flowing into the water. In a third of West Bengal's districts, the government admitted in Parliament earlier this year, drinking water has more arsenic than the maximum limit prescribed by the World Health Organisation. The state government's estimate of the bill for tackling just this arsenic problem: Rs. 750 crore.

The affected area is growing by 20 per cent every year. As for the metropolis of Calcutta, heavily dependent on tubewell water, a city university study says it is on

"the brink of an arsenic bomb".

* Every place has an allied problem. In Delhi, for instance, though most residents are blissfully unaware, the level of fluorides in the water, which can have a crippling effect over time, is well above the safe limit in a number of localities. Some places have increasing salinity problems, some have other contamination, and many have a mix of all these.

* Governments, Union and state, know all this but have done close to nothing. The Union water ministry prepared the draft of a 'model' Bill in 1970, circulating it to the states. It did not cover drinking or domestic use. In 1992, a committee to revise this draft suggested that this omission be made good. No further action has been taken to place the Bill before Parliament. Three states and Pondicherry have some legislation to regulate ground-water exploitation.

* In Delhi there is no law or rule on the subject at all. No one maintains any data on the number of tubewells sunk. The city water supply department itself admits pumping out 65 million gallons of ground water every day for municipal supply. An affidavit from the city government also admits that the water table is continuously dropping.

(Times of India, 18, Oct. 96, by Dilip Rangachari.)

(Water Policy/Management, India, -)

PIONEER (P)

P1). GOMTI POLLUTION ALARMS U.P.P.C.B.:

The increasing demand for drinking water and continuous discharge of effluents into the Gomti has sent alarm bells ringing through the corridors of the UP Pollution Control Board. Starting February end, the UPPCB has checked all the nine distilleries in and around Lucknow. Three major polluting industries have been suspected of releasing their wastes into Gomti which leads to increasing pollution in the river. All these industries use molasses. Despite the installation of standard effluent treatment plants in all these industries, the waste is being released into the river.

According to the UPPCB, the increasing rate of pollution in the river Gomti is due to untreated sewage that flows in from the 33 various nullahs daily. As compared to this huge quantity, the industries add only 7-8% of pollution to the river.

To control and divert municipal waste the Ganga Action Plan, Phase-II is going to prove useful. This was initially financed by the ODA, UK. But after they withdrew, the Government decided to finance it through the Ministry of Environment and Forestry. The river Gomti has been included in the second phase. This scheme has yet to be made, sanctioned and executed.

(Pioneer, 8, March, 98, by Sutapa Mukerjee.)

(Potable Water/Water quality, Uttar Pradesh, Gomti basin)

P2). LAKE AT THE VERGE OF EXTINCTION:

The scenic Kolleru lake, one of the largest freshwater inland lakes in the world and home to 188 species of birds is fast drying up due to indiscriminate exploitation and encroachment of the waterbody.

The lake, situated in Krishna and West Godavari districts of Andhra Pradesh, is spread over an area of more than 900 sq.km. and has a maximum depth of 10 feet during the rainy season and a minimum depth of 3 feet during summer.

It is also the world's largest natural freshwater fish producer of about 30,000 tonnes per year and one of the largest bird sanctuaries with 188 species of birds. The lake has practically disappeared Mr. Rao said, who had authored a voluminous report titled 'Master Plan For Kolleru Development an integrated ecological approach'. In a paper presented at a one day seminar on 'Pollution Control and Strategies for Environment Protection' here on January 23, Mr. Rao explained how development

programmes takes up on the lake without understanding the ecological system had failed and became a 'curse' to the people.

He said the reduction in storage capacity of the lake and high use of inorganic fertilisers in the catchment area and in pisciculture had resulted in increased nutrient load. This in turn led to high growth of aquatic weeds and eutrophication rendering it unfit for sustenance of aquatic animals like fish and freshwater otter.

(PIONEER, 27, Jan.98. by U.N.I., Vijayawada)

(Lake Hydrology, Andhra Pradesh, Kolleru lake)

P3). RECKLESS GROUND WATER USE WILL AFFECT FOOD OUTPUT:

The Worldwatch Institute, in its annual 'State of the World' series, said this could be disastrous for a country like India, which ranks third in world grain production after China and the United States and relies on irrigation for most of its food.

The report noted that in every state and city in India, exploitation of below-surface water has been 'extensive and reckless with no regard for what is sustainable and without any plans for replenishment'.

It warned that the situation was getting worse because groundwater levels continued to decline in much of the country 'as six million pumps lift water for irrigation'. The report said the states incurring huge water deficits from overpumping were Gujarat, Haryana, Karnataka, Maharashtra, Punjab and Rajasthan.

"In Punjab, India's breadbasket, "the report noted, "the watertable in much of the state is falling roughly two-thirds of a metre per year".

(Pioneer, 21 Jan. 1998 by Aziz Haniffa, Washington)

(G.W.H., India, -)

P4). RS. 393-CR DAL LAKE ACTION PLAN GETS NOD:

A Rs. 393-crore action plan has been finalised for the conservation and restoration of the famous Dal Lake in Jammu and Kashmir, facing extinction due to environmental degradation. The Ministry of Environment and Forests is rendering all possible help to Jammu and Kashmir for the conservation of the lake, whose area has shrunk to less than 12 km. from 15 km in 1982.

The lake is in a critical condition since waste water and fertiliser discharge have

caused increased eutrophication with excessive growth of weed and algae in most of the areas. This has resulted in deterioration of water quality.

Noted environment scientist Helmut Kroiss of Austria has prepared an interim report for the conservation of the Dal Lake. Prof. Kroiss has stated that action within the lake such as weeding, local aeration and skimming of algae, help to slow down the degradation process, but will not be able to restore the desired water quality and sustainable ecological development for the future. He has recommended construction of two interceptor sewers along the eastern and western coast of the lake under the peripheral sewage scheme to collect all the waste water discharging to the lake.

Prof. Kroiss, after discussions with the senior officials of the State Government and the Environment and Forests Ministry, said in his report that the sewer system shall not be designed and constructed without an adequate sewage treatment plant. The design of the plant has to be seen in the context of the Jhelum river downstream. He further said that houseboats along the coast of the lake represent a long tradition and a basic infrastructure for tourism. There are technical solutions to connect the houseboats to the interceptors. For this purpose, vacuum or pressure technology should be adopted. The people living in the floating garden areas represent a problem that cannot be solved by engineering. This problem is linked to the constant loss of lake volume.

A population of 50,000 people with increasing infrastructure in this area cannot lead to sustainable development of the lake, and therefore it is necessary to relocate their houses outside the lake. The Nishat Bund should be removed to improve the exchange of water within the whole lake. It will be necessary to build a new pipeline on the bottom of the lake, which is technically possible. The removal of the dike will change the flow pattern to a large extent, he said. He also said that Austria could provide expertise in the conservation of the lake. Austria could provide technical cooperation in the development of sewage systems for the peripheral areas. The revitalisation and restoration of the lake to its lost glory has been a priority of the Government.

(Pioneer, 12 January, 1998 by U.N.I., New Delhi)

(Lake Hydrology/ Environmental Hydrology, Jammu and Kashmir, Dal lake)

P5). GREENS QUESTION SEWAGE WATER USE FOR AFFORESTATION:

The Karnal-based Central Saline Soil Research Institute (CSSRI) has proposed to use untreated sewage water for afforestation in the Capital. It was claimed that the scheme would reduce the discharge of sewage water into the Yamuna and provide the much-needed 'green lung' to Delhi.

The Society for Environmental Awareness (SEA) maintained that the proposed scheme would have harmful side-effects. Convenor of SEA Mr.R. Kishore said the World Health Organisation (WHO) literatures suggested that untreated sewage water could not be used for horticultural purposes. Sewage contains human excreta, Light soil and industrial waste. There were chances that sewage would contain various pathogens and persons exposed to soil contaminated with it would be exposed to health hazards, the experts said. Due to the presence of chemical pollutants and disease causing microbes, discharge of such untreated sewage could pollute both surface and ground water. Green vegetables tend to absorb cadmium from the soil. Though, some of these metals were vital nutrients for human beings, an excess could be bad for health.

However, the Delhi Development Authority has already decided to give 40 acres of land in Dwarka for the experiment for one year. It has agreed to bear a cost of Rs. 5 lakhs for the scheme. A DDA official said sewage water was not being used for growing vegetables or for other horticultural purposes. This would ensure that even if there were harmful side-effects, they would not affect human health. The sewage water would be used only for afforestation purposes, to provide green cover to the area. The scheme, therefore, was environment friendly.

(Pioneer, 30 Nov., 1997 by staff Reporter, New Delhi)

(Forest Hydrology, India, -)

P6). PROJECT TO MINIMISE POLLUTION IN YAMUNA:

A project has been charted out to minimise the pollution in river Yamuna, the Central Pollution Control Board (CPCB) informed the Delhi High Court on Friday. A public interest litigation filed by Dr. B.L. Wadhera had alleged that industrial discharge and pesticides used by farmers in Haryana find their way to the river, making it unfit for drinking for the residents of Delhi.

Originating from Yamunotri glacier at Bandarpoonch peak in Uttar Pradesh, the river while passing through Haryana, collects industrial effluent from Ballarpur Industries, Haryana Distriller, Saraswati Sugar Mills, Chanderpur Paper Mills, Nestle factory and the National Cooperative Distillery. These industries discharge waste water to the tune of 71.5 million litres per day, the petitioner alleged.

However, the Environment Ministry and the Haryana Government clarified in their reply that tests of the river water showed that 'pesticides like aldrin and dieldrin in water and sediments of river Yamuna were below detection level and insignificant'. 'The concentration of DDT and BHC (both pesticides) during the rainy season was found far below the limits prescribed by the WHO for drinking water standards', the Ministry affidavit filed through Ms. Rekha Palli said.

Haryana State Pollution Control Board also said, 'the pesticidal or insecticidal contamination of river water at Delhi-Haryana border are within the limits as prescribed by the WHO'.

(PIONEER, 27 Sept. 1997. by P.T.I., New Delhi)

(Water Quality, Haryana, Yamuna basin)

P7). DEFORESTATION MAKING DELHI A DESERT:

Once a gracious city, Delhi is now fast turning into a desert. Besides high levels of air, water and noise pollution owing to astronomical increase in population figures and industrialisation, the clean, green Delhi of 1960's has donned a state as gloomy as grey expanse of deforested land in 1990's.

A recent study by Vatavaran director Iqbal Malik indicates that 22 per cent of the city has no greenery at all. It is nothing short of a desert. While 30 per cent of Delhi has a sparse green cover, 40 per cent has a tree here or there.

The Vatavaran report states that pollution-absorbent trees must be planted throughout Delhi if a further damage to the environs of Delhi is to be avoided.

(Pioneer, 17, Oct.97 by Karuna Madan)

(Forest Hydrology, Delhi, -)

P8). CANAL TURNED THAR GREEN, SAYS STUDY:

The Indira Gandhi Canal Project, a mega human effort to turn inhospitable

Thar desert in to a green belt, has brought about far-reaching qualitative changes in areas of sand dunes, says a recent study.

The agriculture production in the project area has already exceeded 1.21 million tonnes, which included wheat and cotton, the study shows. The four canal-fed Hanumangarh, Sriganaganagar, Bikaner and Jaisalmer districts have seen an influx of investment of over Rs. 4.10 billion in the last ten years, the study says. There has been an improvement in the micro-climate and a reduction of incidence of sand storms due to afforestation in more than 1.72 lakh hectares land. Fresh ground water storage has been created in the project area, enabling sinking of tube wells for conjunctive use of ground and canal water. Among environmental impacts of the project, the area has not experienced any appreciable soil and land erosion.

(Pioneer, 15 Oct., 1997. by P.T.I., Jaipur)

(Environmental Hydrology, Rajasthan, Thar Desert)

P9). RIDGE GUARDS CITY ECOLOGY:

Delhi is the only city in the world to be situated amidst a natural forest. The city's forest consists of the Delhi Ridge which is a shrub forest consisting of small trees and vegetation. Delhi's location is special as it came up between two natural life support systems- the river Yamuna and the Ridge. The Ridge is an extension of the Aravalis. While the Ridge provided pure air and natural water systems, the river also provided water and a conducive habitat for civilisation to flourish.

The Ridge was the catchment area and a large number of canals sprouted from it. These canals used to feed the Yamuna with all the excess rain water on the east side of the Ridge. They would also run along the west side of the Ridge to the Najafgarh jheel. At the same time, these rivulets, streams and canals would recharge the ground water table. With constant urbanisation, these canals have now been turned into either storm water drains or sewage-carrying nullahs. Interestingly, the Defence Colony drain was a canal once, carrying water from the ridge to the Yamuna. Similarly, the Najafgarh drain was a river which originated from the Ridge and was called the Sahibi Nadi.

The Ridge even though depleted is still trying to sustain Delhiites. It provides a natural barrier for dust from Rajasthan and prevents the desert from spreading.

The Ridge also maintains the humidity level or moisture in Delhi. It keeps the city cool, as areas near the ridge are nearly two to four degrees cooler than the surrounding areas. Still, the Ridge is the centre of controversies. To protect it from further urbanisation and depletion, it was declared as a reserved forest in 1994.

(Pioneer, 13 Oct. 1997. by Rahul Gupta)

(Forest Hydrology/ Environmental Hydrology, Delhi, Yamuna)

P10). WATER WAR:

" A National Authority is needed to direct water resource management in the country, says Pran Nath Luthra."

World Bank vice-president Ismail Serageldin has warned that 'the wars of the next century will not be over oil or politics, but over water'.

A study conducted by Tata Energy Research Institute (TERI) has predicted acute water scarcity in the Yamuna by the year 2050. The study estimates that a 'flow of at least 58 cubic metres per second of pure water would be needed in the Yamuna basin to dilute the treated wastes to meet the desired stream quantity'. Considering the present flow of 5 cubic metres per second, the task at hand is gigantic. According to the National Council of Applied Economic Research (NCAER), a study has revealed that about 25 per cent of rural homes in the country have tap water supply. Bihar tops the list among the neglected parts of India where just 4 per cent of the households have tap water. Out of 5.6 million villages in the country, some 40 per cent do not have safe and adequate drinking water.

Another alarming factor is depletion of ground water. The National Environmental Engineering Research Institute (NEERI) has warned that the water table in the country is sinking because of reckless unsustainable rate of exploiting ground water in most States such as Haryana, Gujarat, Tamil Nadu, Punjab, Rajasthan. At present, agriculturally productive districts in Haryana and Punjab face threatening problems while ground water aquifers have been permanently depleted in Mehsana district of Gujarat and Coimbatore district of Tamil Nadu.

Wasteful water management practices of the 19th century continue to degrade land, to waterlog land and salinise it. Evaporation, leakage and seepage cause massive water losses. Some two million hectares of salinised land have been

abandoned. The situation demands urgent step to employ sprinklers, drip irrigation and brick-lined canals to reduce seepage. Other measures such as industrial use of water, recycling, cropping patterns, a policy for harvesting and retaining rain water and reforms of irrigation practices ought to be enforced urgently. Or else 'water wars' between the States are imminent, such as over the Cauvery river water between Tamil Nadu and Karnataka or between Punjab and Haryana over the Beas and Sutlej water or between Haryana and Delhi over the Yamuna water.

(Pioneer, 10 Sept.,1997.)

(Water crisis, India, -)

P11). NO PRAYERS FOR A DYEING TOWN:

" A landmark judgement teaches Jetpur, the Sari town of Gujarat, that it doesn't pay to trifle with the environment".

The Bhadar river which passes by Jetpur, popularly known as the sari town of Gujarat, flows red - but for a very ungallant reason. The dyeing and printing units which proliferated in the town over the years, sweped chemicals and colours into the river turning every reservoir, pond and well, crimson red. However, on August 28, 1997, the Gujarat High Court passed a judgement directing the closure of all the dyeing and printing units in the town thus ending a long, protracted battle between sari traders and environmentalists.

Located about 60 kms from Rajkot, the groundnut bowl of the country and the hub of the fertile Saurashtra region, Jetpur has about 1,200 cotton and rayon sari dyeing and printing units which together manufactures about three lakh saris per day. Environmentalist Shami Antala asks angrily, "The High Court has been more than patient. Time and again it sent reminders to the Jetpur traders to mend their ways and to ensure proper remedial action so that pollutants do not contaminate the environment. Water tests in towns like Rajkot, Dhoraji and Jetpur, reveal extremely high levels of pollution. The composition of suspended solids was found to be 500 mg, as against the maximum permissible mark of 100 mg. Ammonical oxygen which should cross 0.2mg was found to be 0.8mg, sodium which should not be more than 0.2 mg was found to be as high as 30mg. The industry uses as many as 29 chemicals in their plants including urea, sodium silicate and sodium nitrate. Because of the

presence of toxic chemicals, there has been an increase of stomach and intestinal disorders as well as an alarming rise in cancer and skin diseases.

(Pioneer, 31 August, 1997. by R.K.Mishra)

(Water Pollution, Gujarat, Bhadar river)

P12). HELP FROM THE SKY:

" Remote sensing had helped coastal fishermen ascertain their catch. Now it is helping farmers in drought prone areas plan their crop sequence." N.C.Jain reports- Hissar-based Haryana State Remote Sensing Application Centre, in collaboration with the National Remote Sensing Agency, Hyderabad, has recently released a resources atlas of the Mahendragarh block of Mahendragarh district of Haryana, which is based on remote sensing data. The implementation of the action plan in the form of a land utilisation map will boost the development of this area slowly, but surely.

Specifically, the action plan map of Mahendragarh block is aimed at combating drought in the long run on a sustainable basis through a holistic resource evaluation-cum-integration. The study area is bound on the north by Bhiwani district, on the east by Kanina block, on the south by Narnaul block and by Rajasthan on the west. The present study is a part of the nation - wide programme of an Integrated Mission for Sustainable Development (IMSD). It is a sound and scientific methodology for efficient and sustainable management of natural resources. The mission was launched in 1987 as a technology demonstration cum exploration study to counter recurring droughts.

IMSD, employing remote sensing technology in conjunction with conventional techniques, met with phenomenal success. The pilot study involved an integrated survey in 21 drought prone districts in the country. Within a span of one decade, IMSD today addresses diverse problems like fragile balance of mangrove forests top soil run-off, landslides, loss of biodiversity of forests, tribal habitat, their customs and traditions etc., specific to areas like coastal regions, hilly terrains, tribal belts and flood prone area. IMSD adopts an integrated and holistic approach to development.

(Pioneer, 28 Aug.,1997 by N.C.Jain)

(Remote sensing/ Drought Hydrology, India, -)

P13). ACTION AGAINST DISTILLERY FOR POLLUTING RIVER:

The State Government has initiated action against Hargoan, Distillery in Sitapur district for discharging toxic effluents into the Gomti river. Officials of the Uttar Pradesh pollution Control Board have been sent to the distillery for checking the waste disposal system of the plant. The District Magistrate has held talks with senior officials of neighbouring districts of Sitapur and Lakhimpur regarding the discharge of toxic material from the factories of those areas into the Gomti river. Due to the discharge of effluents, colour of the water supplied by the Jal Sansthan had become yellowish.

(Pioneer, 19 Aug., 1997. by Pioneer News service, Lucknow)

(Water Pollution, Uttar Pradesh, Gomti river)

P14). GRAND PLAN TO BRING WATER TO NAJAFGARH:

The Indian National Trust for Art and Cultural Heritage (INTACH) has drawn up a plan to bring water to the Najafgarh block by harvesting rain water. The project also includes the formation of a waterway and games facilities.

In the ambitious plan, INTACH has taken up a stretch of 30Kms of the Najafgarh drain, from Dhansa regulator to Kakraula regulator. It conceptualised a proposal for the on-channel water storage for artificial on-channel recharge of groundwater. INTACH plans to recharge the ground water by storing fresh water over the recharge area, which is the Najafgarh drain.

INTACH intends to do this by extending the time and space over which water is recharged from the Najafgarh channel. INTACH found in its study that the Najafgarh drain has a large capacity for storing water. The plan now hinges on storing run-off water from local catchment areas, flood waters and, in exceptionally lean years, by diverting a calculated fraction of Yamuna water to the drain.

The plan envisages closing the karkraula regulator towards the later half of the monsoon season. Experts at INTACH say more water is available than the storage capacity of the drain. The drain capacity will therefore be increased by desilting the drain towards the bed level and thereafter, by lowering the bed level by one meter. The proposed on-channel recharge would lead to the replenishment of the groundwater aquifer. Also planned are 500 shallow tubewells on both the sides of

the drain which will either supply water to the DWS & SDU or straight to areas for direct use. By this plan, the problems of the Najafgarh block will be solved. The block includes 72 villages, 4 census towns and the Najafgarh town. It also has the Dwarka subcity and also planned several rural growth centres. The block therefore is undergoing extensive urbanisation.

(Pioneer, 6 Aug., 1997 by Rahul Gupta)

(Water availability, Haryana, Yamuna)

P15). PROJECT TO CLEANSE 'DYING' YAMUNA OF HYACINTH:

"Water hyacinths in the Yamuna have grown almost one metre long. Removal of the weeds leave the roots intact which invariably develop into full grown hyacinths," said Dr. Rakesh Kishore, an environmentalist.

"The short-cut method adopted by the Government to physically remove the weeds is no solution to the problem," said Dr. Kishore. "It needs constant cleaning through out the year," he added. Even the mosquito menace which has troubled the Capital this year, is attributed to the mushrooming of hyacinth in the Yamuna. Experts say that round the year, except for a brief period of monsoons, when the river is flooded, water remains stagnant in the river which is the root cause for the growth in hyacinths.

(Pioneer, 14 July, 1997 by Vishwas Kumar)

(Environmental Hydrology, Delhi, Yamuna)

P16). AT SEA WITH POLLUTION:

" Mahendra Pandey says that the world community has a considerable burden to bear in reducing marine pollution"

In India, rivers contribute to coastal pollution by transporting a wide range of pollutants through land drainage. All the Indian rivers carry annually about 1645 cubic kilometre of water to the seas. As almost all the rivers are polluted in our country, there is no doubt that they carry huge quantities of pollutants along with them. In addition to this it has been estimated that about 135 thousand million metric tonnes (MT) of sediment and 32 thousand million MT of soluble matter enter the ocean through various Indian rivers. This constitutes 90 per cent of the total waste going into

the ocean. The rest 10 per cent of the waste matter which goes into the ocean is constituted by wind, rain and earthquakes. It may be noted that the water flowing through all Indian rivers is five per cent of the water flowing through all the rivers of the world. Indian rivers carry 35 per cent of the sediments that go to all the oceans in the world.

A concentration of lead and cadmium (820 microgram per litre (mgpl) and 336 mgpl respectively), were observed in the Thane creek. Mercury concentration is 778 mgpl. 12 Karnataka towns are situated along the 300 kilometre long coast discharging untreated wastewater or about 30 tonnes of organic load directly into coastal waters daily. Three major industries besides a host of medium and small units alongside the coast dump 30000 cubic metre of industrial effluents into the sea everyday.

Along the Kerala coast, 14 municipal bodies discharge about 650 tonnes of organic matter per day into coastal waters. Another 300000 cubic metre of industrial effluents. Emanating from 200 large and medium and 2000 small scale industries are directly discharged into the sea. The heavy traffic of marine vessels for fishing, port and defence-related operations makes the coastal waters vulnerable to water quality degradation. In the 1050 kilometres long Tamil Nadu and Pondicherry coasts the major polluting industries are textiles, chemicals, fertilizers, pulp, paper, cement, sugar, mining and mineral processing. In Andhra Pradesh, which has a coastline of 980kms. pollution is caused not just by industrial units but by port related operations at Vishakhapatnam and Kakinada where intensive mechanised fishing leads to heavy traffic of marine vessels. The problem is almost the same in Orissa and West Bengal. The water quality has deteriorated because of similar operations at Haldia and Calcutta ports. Besides a large quantity of effluents from the Calcutta and other municipal areas find their way into the coastal waters mainly through Hooghly estuary. It is clear that our coastal waters are reeling under the severe threat of pollution.

(Pioneer, 5 June, 1997.)

(Marine Pollution)

P17). CENTRE TO SEEK OVERSEAS FUNDS TO SAVE DAL LAKE:

The Dal Lake, which was once known for its pristine beauty, is fast loosing

its charm due to the unabated human follies such as encroachments, siltation, raw sewage disposal, conversion of water into floating gardens and land, excessive weed-growth and algal bloom. The Dal Lake has shrunk from its original surface area of 76 sq.km. to 11.50 sq.km. in 1994. The population in the catchment area has increased from 1.66 lakh in 1973 to 2.57 lakh in 1989. People felt free to abuse the lake in whatever form they liked. The successive Governments, in this period, also allowed the construction of hotels on the southern and western shores of the lake, multiplying the sources of point load pollution.

The experts say that if the degradation of the Dal continues with the same pace, it will be completely lost by the year 2070. Expressing concern over the desecration of the Dal, the Union Minister said Rs. 334 crore have been granted by the Central Government for the Dal project. Austria, which has the experience of treating water bodies, has already agreed to provide the technology, he said. A team of Austrian experts would visit the State soon and they would prepare a project report for the Dal and all other water bodies. Thereafter a comprehensive plan would be chalked out.

(Pioneer, 4 June, 1997. by Rashid Ahmed, Srinagar)

(Environmental Hydrology, Jammu and Kashmir, Dal lake)

P18). LITTLE DROPS OF WATER.....:

"A visit to the Bundelkhand region shed some light on various attempts being made to develop the region and rejuvenate both the ecology and the economy."

A number of initiatives have been taken by various organisations for the area's development, from both the environmental and human resource perspective. One such is Taragram, in Orchha, Madhya Pradesh. Founded and run by Development Alternatives, an NGO, Taragram (Tara being an acronym for Technology and Action for Rural Advancement) was conceived in 1995, when a 10 acre site in the Bawedi jungle was leased out to the organisation for the purpose of an appropriate technology centre. In an attempt to restore some ecological balance, another project wasteland development or the greening of barren hills is going on. This has a dual purpose-to minimise soil erosion and absorb the excess water and allow it to trickle downstream, so that even wells at a distance of half to one kilometre get filled up. The work on

earthwork was started in December 1987 and finished by April 1991.

The aim of the contour trenches built is to collect the rain water, the overflow trickles into another trench barrier and so on, thus acting before the speed of the flow develop (erosive velocity) and damages the vegetable cover on top. Without this cover, the capacity of the soil to absorb is minimal.

(Pioneer, 22 May, 1997 by Kadambari Murali)

(Water availability/ Soil erosion, Madhya Pradesh, -)

P19). CRATER ENDANGERS MYSORE KRS DAM:

How safe is the Krishnarajasagar (KRS) dam overlooking the famous Brindavan Gardens in Mysore?

The structure of the dam, which was built 65 years ago when Sir M.Visvesvaraya was the dewan of the erstwhile Mysore State, is facing twin threats from a crater detected in the canal bed near the dam wall and controlled blasting undertaken near the main gate of the KRS for an approach channel. The chance discovery of the crater occurred when the water was drained out for modernisation of the canal early this year. The huge pit was noticed right below the sluice gates. The pit, measuring about 140 feet in length, 30 feet in breadth and 17 feet deep if not filled up in time, would pose a serious threat to the safety of the dam.

It is estimated that it would require 17,000 cement bags, about 800 truckloads of gravel to fill up the pit. According to chief research officer of the Kamataka Engineering Research Station, S. Venkataramana, the crater has been formed owing to the absence of dissipaters (wave suppressors), a technology which was not available when the KRS was built in 1932. Dissipaters reduce and equalise the velocity of water gushing out of the sluice gates.

"All dams constructed after Independence have dissipaters, an imported technique," he added. When asked why such a huge pit next to the dam was not noticed all these years, he said the canal never went dry in the last 50 years.

(Pioneer, 20 May, 1997.,by P.T.Bopanna, Banglore)

(Dam Construction, Karnataka, Krishnarajasagar Dam)

P20). WATER CRISIS IN ORISSA DROUGHT BELT:

An acute drinking water crisis compounded by receding ground-water level continues to plague people in the drought-hit areas of the state. The situation in Bolangir and Padampur of Bargarh district was assessed recently by an Assembly panel which travelled about 250 km in this parched belt. The committee, according to sources, found that the tube-wells dug by the government in these areas were not enough to meet the needs of the people. It is likely to recommend more financial assistance for overcoming the water crisis while it remains aware that receding ground water level has made the job of sinking tubewells difficult.

The committee also surveyed the employment and irrigation scene in the drought belt. With a large area of Bolangir district remaining unirrigated, the visiting members emphasised the need for completion of Indra and Suktel Irrigation projects.

(Pioneer, 15th May, 1997. by P.T.Bopanna, Bangalore)

(Drought Hydrology/ Water crisis, Orissa, -)

P21). TOXIC POLLUTION CLAIMS FOUR LIVES IN BELLARY:

A major environmental disaster in Karnataka has claimed four lives, affected the health of over a lakh of people living on the banks of the Tungabhadra river in the districts of Bellary and Raichur after toxic effluents from a sugar factory were let off into the river following the bursting of 2,000-tonne capacity bank containing molasses.

The mishap occurred at the Indian Sugar & Refineries at Nospet after which the factory management reportedly discharged the effluent into the Rayabssava canal result in the pollution of water in a 30 km. radius. The water contamination led to the death of several tonnes of fish and affected the population living along 150 villages along the river bank. The contamination is slowly taking its toll and the affected villagers are being admitted to the civil hospital at Gangavathy. In several villages, a large number of children developed suffocation due to the consumption of contaminated water. The mishap has focussed on the negligence of the sugar factory management and the inspecting authorities, including the pollution Pollution Control Board.

(Pioneer, 13 May 1997.)

(Water Pollution, through toxic effluent, Karnataka, Tungabhadra river)

P22.) LAGGING BEHIND ON RURAL DEVELOPMENT:

"The centre, State and local bodies must work in cohesion to implement development schemes, says Bindeshwar Pathak"

Development of rural areas and population was among the main objectives of the Eighth Five Year Plan. During the Plan, the rural water supply programme was intended to cover the entire rural population - estimated to be 62.86 crore as per the 1991 census. Reports indicate that the progress was tardy, only 81.64 per cent of population having been supplied with potable water facility. More than 30 per cent of population in six States and Union territories viz. Assam, Manipur, Mizoram, Kerala, Nagaland, Punjab and Tamil Nadu remains uncovered by the water supply programme.

(Pioneer, 9 May, 1997.)

(Potable water, India , -)

P23). YAMUNA TURNS BLUE WITH GREEN COVER:

Never has the Yamuna been under such a deadly green cover. Dark green water hyacinths have covered more than half the river in barely a year's time. The water hyacinths are home to one of the most dangerous species of mosquitoes, the *Culex tritaeniorhynchus*, which causes Japanese Encephalitis, the mortality rate of which is as high as 30 per cent. Already, the entire stretch from the ITO bridge to the Okhla barrage is clogged with these deadly hyacinths. Mr. Prabhakar, professor and environmentalist with Kalpvriksh said. "The stretch near the pontoon bridge has a lush carpet of water hyacinths, much more widespread than what it was two years back".

Experts say, the alarming growth of this weed is due to the river stagnating at a number of points, particularly under the bridges. The water hyacinth does not let sunlight penetrate the river, thus slowing down or greatly reducing the photosynthetic process of aquatic plants. This, in turn, reduces the oxygen content of the water, endangering marine life. The oxygen level in water should be at least 4 milligrams per litre for the survival of marine organisms.

A study by students of the Naval Public School (NPS) claims that the oxygen level in the river at ITO is zero. "This means that at ITO, the river will not be able to sustain any fish or other marine organisms". Ms. Sreenivasan of the NPS said. The

head of the school's Environment Club, she has led the students in research on the Yamuna for the last three years. In a similar manner, the hyacinth also does not let the river absorb oxygen from the atmosphere. It forms a layer over the waters preventing the river from absorbing oxygen.

The research by the school students says that the level of turbidity, i.e. the concentration of suspended particulate matter (SPM), has gone up to more than a hundred. This is extremely dangerous as the water becomes warmer because the SPM absorbs heat from sunlight. These heavy solid materials do not dissolve but settle down, smothering organisms on the river bed. The phosphate level in the Yamuna is also very high. The study says that excess of these chemicals causes anaerobic conditions where the ecosystem of the river collapses.

The Yamuna's phosphate level stands at more than one per cent whereas the normal level is 0.1 per cent. The present state of the river provokes Mr. Sureshwar, Dr. Sinha of the Paani Morcha, an organisation striving to save the Yamuna, into saying that "it can kill".

Mr. Prabhakar feels that "the Yamuna is a dead river and we killed it". The condition of the river has reached a stage where it is beyond revival. If at all the Yamuna can be saved, it is only through the efforts of the Government, environmentalists and more importantly, the residents of Delhi.

(Pioneer, 8th May, 1997. by Rahul Gupta)

(Water quality/ Environmental Hydrology, Delhi, Yamuna)

P24). DEMAND TO INCLUDE WATER IN UNION LIST:

A task force on the management of water resources in the National Capital Region of Delhi has recommended that water be considered a national asset. Strategies be evolved to enable greater inter-State co-ordination for use and harvesting of water the task force in its recommendations to the Government has said that water should be brought on the Union list and until such time a forum must exist anticipate inter-State problems and promote collaborative solutions for water deficient areas. The task force constituted a two-day seminar in November 1996 on "the problems and alternatives of water resources of the NCR" said a holistic planning of water resources should be carried out based on rain water harvesting, flood water

storage, enhancing ground water and recycling.

(Pioneer, 8 May, 1997 by U.N.I., New Delhi)

(Water management, India, -)

P25). FOR BETTER WATER MANAGEMENT:

" Private Investment and water harvesting can solve the drinking water problem in the country to a great extent, says Santosh Tiwary"

India, like most other developing nations, is facing an ever-deepening drinking water crisis. According to an assessment Rs. 51,300 crore would be required for urban water supply and sanitation during the period 1997-2002. Only Rs. 4,000 crore has been proposed for investment under in the Ninth Five Year Plan for the sector.

To remove this major bottleneck, private participation by the Ministry of Urban Affairs in this field is a welcome step. The political statement and action programme, adopted at the International Ministerial Conference on Drinking Water and Environmental Sanitation, held in the Netherlands in 1994, has served as a base for several countries in this connection. "Dying Wisdom: The Rise, Fall and Potential of India's Traditional Water Harvesting Systems", a book published by the Centre for Science and Environment recently, is in line with this inclination. Almost 5,000-year old rainwater harvesting system of the subcontinent, known as Kund and developed by the people of Thar desert in Rajasthan can be singled out as a potent means for meeting the drinking water needs of our villages.

Traditional technologies like Kund can substantially minimise the problem of drinking water in rural areas. The technology is simple: select a piece of land and artificially slope it in such a way that any water that falls in that area reaches a well at the centre or on a side of the land. In an area getting only 100 mm of rain in a year, a one hectare catchment can provide one million litre of water a year. Which means a that with bare minimum facilities, critical water needs of a village can be met. Gather water during the monsoon and use it throughout the year.

(Pioneer 5th May, 1997.)

(Water management/Water Harvesting, Rajasthan, -)

P26). GOMTI POLLUTION EXCEEDS PERMISSIBLE LEVEL:

The threat of colitis and cholera looms large on Lucknow as the river Gomti, main source of drinking water, continues to flow dirty. The water level of the river falls in summer. As the concentration of effluent water increases, so does the threat of spread of cholera and colitis. The affect of these effluents is most evident in old Lucknow where innumerable patients of colitis can be encountered. An indicator to the extent of pollution is the excessive number of the bacteria. Faecal Coliform, found in the river water.

According to the standard set by the World Health Organisation (WHO), there should not be more than 5000 bacteria in 100 cc of water, But in Gomti, between Dalliganj bridge and Hanuman Setu, the bacteria count has soared to 1.75 lakh per 100 cc of water. The directives of the High Court to throw only 'treated' water into the river has been thrown into the lumber room with the result the nullahs and the factories situated at the bank of the river are still pouring effluents in the river. An official of the Pollution Control Board (PCB) said that the effluents of the factories were found to contain detergent solvents, cynide, mercury, cadmium and burn chloride among other elements.

The importance of Gomti for the people of Lucknow owes to the fact that it quenches the thirst of over 10 lakh people. This river nurtures eight cities in its 715 km. long stretch before merging into Ganga in Audihar in Jaunpur. The cities situated on its banks are Lucknow, Sitapur, Hardoi, BaraBanki, RaeBareli, Pratapgarh, Sultanpur and Jaunpur, Ironically these are the cities which had turned this river dirty. According to a rough estimate the 25 nullahs including Sarkata, Patanullah, and Wazirganj pour around 6.5 million litres of effluents daily into it. Besides it, three cremation grounds Guala, Murdahia and Bhainsa kund on the bank of the river are also adding to the pollution. Scientists at the Central Water Commission claim that an average flow of the Gomti water is 1,500 million litres per day (MLD). During rains it reaches even 45,000 MLD while in summers it falls to 500 MLD.

Everyday the city draws around 200 MLD of water from Gomti. During summers 210 MLD of effluents are released daily in the remaining 300 MLD of water, thus making it unworthy of even bathing, leave alone drinking. According to

suggestions made by ODA, all the sewage lines including its branch lines should be cleaned at the earliest. All the nullahs should be covered and no untreated effluent should be added to the river. Moreover they have also forbidden washing of clothes and bathing of animals in the river.

Despite these proposals and suggestions the nullahs continue to pour their effluents into the river and washermen continue to wash clothes in the Gomti.

(Pioneer, 23 April, 1997 by Biswajeet Banerjee)

(Water pollution, Lucknow, Gomti river)

P27). DRINKING WATER FOR 100 VILLAGES:

The Haryana Government has drawn a plan to provide over 70 litres of potable drinking water per capita per day in 100 villages of Hissar Rohtak Sirsa, Bhiwani Mahendragarh and Rewari Districts under drought prone area programme during the current financial year. Government had also decided to increase the water supply in big villages to 110 litres per capita per day and sewerage facilities will also be provided so as to bring them at par with the small municipal towns.

(Pioneer, 19th April, 1997.)

(Drought Hyd./ Potable water, Haryana, -)

P28). PLANS TO SLAVAGE CHILKA AS BIRDS DEPART:

With a view to maintaining the health of the lake, which is a major concern of environmentalists, the State Government has drawn up an ambitious plan for dredging its mouth to ensure better inflow of sea water. As the mouth was getting progressively narrower because of sand load, the salinity level of Chilka was falling.

The lake takes heavy sandload from several small rivers which fall into it. The erosion of top soil in adjoining areas further contribute to the phenomenon. Large scale shrimp farming is also posing a threat to the fragile ecology of Chilka. The State Government's drive against illegal shrimp culturists and the proposed dredging plan may help restores the natural balance.

(Pioneer, 12 April, 1997)

(Lake Hydrology, Orissa, Chilka lake)

THE HINDU (H)

H1). KRISHNA WATER FOR CHENNAI:

Of the 4,000 cusec of water let into the Kandaleru-Ooondi (KP) canal of Chittoor district, one fourth has to be let out at the A.P.- Tamil Nadu border for use by Chennai and the balance used to irrigate land within A.P. But this canal is so leaky that the entire portion meant for irrigation is presently getting lost through percolation as groundwater. Steps are now being taken to line the canal and convey surface water by gravity through a network of canals. The rock formations in the region are so highly disturbed that there is going to be substantial seepage even after lining. The tendency of the local farmers then would be to make good the deficiency by encroaching into the water meant for conveyance to Chennai in years of low flows in the KP canal, the local farmers may not allow the water to pass through until their irrigation needs are met and the A.P. Government may then be helpless in fulfilling the commitment to supply the Krishna water to Chennai.

It is noted that the command area of this portion of the KP canal, which is close to the sea, is prone to floods of varying magnitude almost during every north-east monsoon. Ever since water was let into the KP canal in 1996, this flood havoc got aggravated leading to the inundation of most of the low lands by rainwater, breaches of irrigation structures and seepage from the canal. The havoc is going to further aggravate in the coming years if floods succeed in damaging portions of the irrigation network under construction.

The supply of water through canals leads to gross under utilisation of ground water, causing water-logging, soil salinisation, infertility and reduced crop yields. It is a known fact that irrigation by groundwater is much more productive than that by surface water because groundwater is completely at the command of the farmer and can be applied to the crop exactly when and to the exact extent it is required, while surface water is undependable in its timeliness or for the adequacy of supplies.

(The Hindu, 24, Feb.,98.)

(Water availability, Chennai, Kandaleru-Ooondi (KP) Canal)

H2). CAPITAL FACES WATER CRISIS:

The Capital is facing a serious water crisis. The production of drinking water has been reduced by half because of a sharp deterioration in the quality of raw water

in the Yamuna.

The quantum of production at the water treatment plants was reduced today after an abnormally high percentage of chemicals was detected in the raw water flowing in from Haryana through Drain No.8 at Jagatpur near the Wazirabad Water Treatment Plant.

The areas worst affected by the crisis are the entire South Delhi, City and Sadar Paharganj zones, the New Delhi, City and Sadar Paharganj zones, the New Delhi Municipal Council area, Karol Bagh and Delhi Cantonment. These areas received no water at all or at very low pressure on Thursday evening.

(The Hindu, 20, Feb., 98.)

(Water crisis, Delhi, Yamuna)

H3). NGOs TO HELP GOVT. ON WATER DEVELOPMENT:

The Ministry of Water Resources has set up a Non-Government Organisation group for creating public opinion amongst people to convince basin States for agreeing to the linking of peninsular rivers and the transfer of water from surplus to deficit areas.

Giving this information at the 14th annual general meeting of the National Water Development Agency Society here today, the Secretary Water Resources, Mr. Mata Prasad, said public support was vital for translating the vision of linking rivers from mere theory to actual ground level reality.

He said the resource requirements of the next millennium could only be met with the optimal utilisation and sustainable development of the given resource base. The need of the hour was to plan the given requirements of water at regional levels and balance it with the national level requirements.

The secretary said the cooperation of States was vital for advance planning to meet the requirements of food and fibre, poverty alleviation and rural employment generation. The establishment of the National Commission for Integrated Water Resources Development Plan was a step in this direction.

(The Hindu, 20, Feb., 98.)

(Water Management, - , Peninsular River)

H4). RS. 17.58 CR. GRANT FOR TWO ENVIRONMENT PROJECTS:

The India-Canada Environment Facility (ICEF), a joint initiative of the Canadian Government and the Government of India, has approved grants of Rs. 17.58 crores for two projects on environmental protection and sustainable development and water resources management in India.

The second grant of Rs. 14.38 crores has been approved for Loktak Development Authority, Government of Manipur and Wetlands International - South Asia, for implementation of sustainable Development and Water Resources Management of Loktak Lake Project, Manipur and catchment area.

The purpose is to build capacity within the Loktak Development Authority, other concerned institutions and the local communities. The ultimate purpose, however, is to provide livelihood security to the local communities while ensuring conservation of the lake.

The India-Canada Environment Facility is a joint venture of the Indian and Canadian Governments to promote the capacity of Indian institutions to enhance and deliver sustainable development programmes addressing the environment. The priority areas are energy, water, land resources, conservation and development.

(The Hindu, 11, Feb.,98.)

(Environmental Hydrology, India -)

H5). WATER AVAILABILITY AS A SOCIAL RIGHT:

A Study of Visakhapatnam: Annapragada Subba Rao; Chugh Publications, 8, Strachey Road, Civil Lines, Allahabad-211001.

Efficiency of a vital utility service like water supply depends on how it is rendered and here comes the need for water management. Though water management is an all-embracing activity, the author has limited his investigation to urban drinking water supply.

Likewise, The study pertains to Visakhapatnam, one of the fastest growing cities in Asia, but its findings can be applied to any Indian city in view of the similarity of the problem of managing the service.

With a mere nine to 10 gallons per capita a day, against the national standard of 40 GPCD, the situation in Vizag is indeed alarming, considering the rapid

urbanisation the city is undergoing. Out of the 50 wards in the corporation, only 40 have assured protected water supply, the rest, being mostly slums, have to fend for themselves with other sources of supply with no guarantee of safety.

Tracing the growth of the city water supply system from the start of this century vis-a-vis the exponential increase in the population of one million is expected to treble, further straining the already strained supply mechanism.

With the projected industrial expansion, the requirement would be around 320 million gallons a day, including 120 mgd for domestic purposes. As the existing five major sources of supply relate to non-perennial rivers or streamlets, the city's thirst could be quenched only by diverting water from the Godavari by executing the Polavaram project.

Water supply, being the most capital-intensive and constantly changing public utility service, requires to be tackled with a multi-disciplinary approach and with multilateral financial involvement including that of global funding agencies.

The author has done well in presenting this indepth analysis of the problem with a future perspective, and it should serve as a guide to civic authorities everywhere.

(The Hindu, 27, Jan.,98)

(Water availability/ Water Management, India)

H6). FRESHWATER CRISIS IN THE OFFING:

"A mammoth freshwater crisis awaits future generations of Indian children and their natural environment". a report released by the World Wide Fund for nature (WWF) and the United Nations Children's Fund (UNICEF), has warned.

The report, "Freshwater for Children and Nature", officially launched at the beginning of a two-day international conference yesterday points to increased pollution of both surface and groundwater, improper water resource management, and the shortcomings in the design and implementation of legislation as the major factors precipitating the freshwater crisis in the country.

The report suggests that there is an urgent need for legislative changes combined with technological and market interventions. Without such comprehensive measures India may face a severe water scarcity and the degradation of freshwater

ecosystems by the turn of the century.

The crisis, however, is not due to the lack of fresh but the availability of adequate quality water at the right places and required times to meet the basic needs, says the report.

Nearly 44 million people are affected by water quality problems either due to pollution or the presence of fluoride and iron deposits or due to ingress of salt water and arsenic.

"We have taken up pollution control measures in 14 states where major rivers have been heavily polluted. The work envisages interception, diversion and treatment of all waste water. Polluting industries have been pressurised to set up effluent treatment plants and a national network of 480 water quality monitoring stations has been established to analyse the variations in the quality of water in our rivers", the Minister for Environment and Forests, Prof. Saifuddin Soz. said.

(The Hindu, 22, Jan.,98)

(Potable Water, India, -)

H7). EXPERTS TO MONITOR FLOW OF GANGA WATERS:

Experts will begin to observe and record daily flows in the Ganga waters from January 1 as per the Ganga water treaty, the Joint River Commission (JRC) sources said here today.

They said teams of experts from both countries will observe and record the flows at Farakka point in the feeder canal and at the bridge in Bangladesh during the five-month lean period till May 31.

India and Bangladesh signed a 30-year historic water treaty on December 12 last year removing a major irritant in the relationship between the two neighbours.

(The Hindu, 30 Dec. 1997.)

(Interbasin Water Transfer, India & Bangladesh, Farakka Dam)

H8). FEWER DROUGHTS IN INDIA PREDICTED:

"Frequent occurrence of droughts in India might have come to an end around 1990 which may be followed by rainy conditions for a decade or two", says Dr. H.N. Bhalme, a scientist from the Indian Institute of Tropical Meteorology (IITM) in Pune.

Dr. Bhalme and his colleagues at the IITM have based their conclusion on the analysis of anomalies in global Sea Surface Temperatures (SST) in the past, referred to as the SST Index.

The present trend of the SST Index is towards cooling which is good for India. "We can expect good days ahead with less frequent droughts". Dr. Bhalme told an international symposium on Asian monsoon here today.

The IITM scientists examined the SST of the northern and southern hemispheric oceans for a 120-year period from 1871 to 1990. They studied the SST for three crucial monsoon months - July, August and September.

They observed that the two periods which witnessed frequent droughts - from 1901 to 1920 and from 1965 to 1990 broadly corresponded with warm the SST Index.

The reverse trend of the SST Index cooling started from 1990 and was likely to continue for one or two decades, bringing in good rainfall for the country, Dr. Bhalme said.

This could be one reason why India recorded the 10th successive normal monsoon this year in spite of the worst El - Nino phenomenon in other regions, Dr. Bhalme said.

The SST Index is calculated by subtracting the sea surface temperature of the southern hemisphere from that of the northern hemisphere.

During the earlier warm SST Index periods from 1901 to 1920, and 1965 to 1987, droughts occurred as frequently as every two or three years.

In the last spell, India recorded droughts in 1965, 1966, 1968, 1972, 1974, 1979, 1982 and 1987.

(The Hindu, 4 Dec., 1997.)

(Drought Management, India)

H9). BOOK ON ENVIRONMENT AND FOREST LAWS PUBLISHED:

For the first time, an extremely useful and enlightening book on environment, forest and wildlife protection laws in India has been published in the Doon Valley with the technical and financial support of the Wildlife Protection Society of India (WPSI).

Handbook of Environment, Forest and Wildlife protection laws in India gives all the crucial background information vital for the understanding and use of the legal

system by non-professionals.

(The Hindu, 28 Nov. 1997.)

(Environmental Hydrology/ Forest Hydrology, India)

H10). DELHI GROUNDWATER HEAVILY CONTAMINATED:

The groundwater in Delhi is contaminated with harmful fluorides and nitrates, far beyond the maximum permissible limits in some pockets, warn scientists.

The heavy contamination is due to leaching of these chemicals along with irrigation water and surface run-off from surrounding areas, says the study by scientists at the Nuclear Research Laboratory at the Indian Agricultural Research Institute here.

The contaminants, concentrated mostly in West Delhi blocks, are moving towards central urban area along specific flow pathways due to hydraulic gradient, and are polluting freshwater sources too.

Almost half of Delhi's groundwater is laced with fluorides and one-third with nitrates, an IARI team, headed by Dr. P.S. Datta, has found. They recently published a comprehensive report on their findings.

Almost 70 per cent of Delhi's population directly or indirectly depends on groundwater resources.

Dr. Datta and colleagues estimated the fluoride and nitrate levels using the stable isotope techniques. Their study indicated that almost half of Delhi was affected by fluoride contamination beyond permissible limits. Very high levels were found near brick kilns in western part of the Ridge area, covering Nangloi, Najafgarh and Alipur block.

The fluoride levels varied from 0.1 to 16.53 milligrams per litre, with maximum permissible limit being 1.5 mg.

Dr. Datta's team found high sulphate levels, near the western and northern boundary. They say sulphate contamination of groundwater has mostly taken place due to leaching of pollutants present in stagnant water pools, puddles and surface run-off collected in low lying areas.

(The Hindu, 24 Nov. 1997.)

(G.W.H., Delhi)

H11). OOTY, KODAI LAKES CHOSEN FOR ECO-RESTORATION:

The Udhagamandalam and Kodaikanal lakes have been chosen for eco-restoration as part of the National Lake Conservation Programme (NLCP).

An outlay of Rs. 40 crores has been approved by the Centre, and of this, nearly Rs. 25 crores will be earmarked for the Udhagamandalam lake.

The programme, to be implemented as a Centrally-sponsored scheme during the Ninth Plan, covers 10 lakes in the country including the Dal Lake in Jammu & Kashmir and the Hussainsagar Lake in Andhra Pradesh, official sources say.

The NLCP broadly envisages pollution abatement of the two water bodies, besides improving them from the viewpoint of ecology and tourism. The project components are conservation, protection and restoration of forest cover, erosion control measures on agricultural and vacant land by permanent vegetative cover/engineering structures, desilting, and improvement of treatment system for sewage and solid waste, including vermi-compost disposal.

While the pollution in the Udhagamandalam lake is mainly due to the entry of domestic sewage, the situation in Kodaikanal is not as bad as in the former. "But, it is true that waste from a hotel in Kodal is also being let into the lake," a senior official in the Environment and Forest Department acknowledges.

Due to growing human activity in the hilly regions and associated functions, such as intensive agriculture, animal husbandry and opening of commercial establishments, the two lakes have come under enormous pressure, leading to increasing siltation and eutrophication. Besides, the lakes catchment areas have been degraded. Over the years, the size of the Udhagamandalam lake has shrunk by more than 50 per cent.

Meanwhile, the Union Environment and Forests Ministry has chosen Bishop Heber College, Tiruchi, for ascertaining the impact of pollution control measures on the quality of the Cauvery water in five stretches in the State. The pollution abatement work in the stretches Komarapalayam, Bhavani, Erode, Pallipalayam and Tiruchi - along the Cauvery is being implemented under the National River Action Plan (NRAP).

(The Hindu, Nov. 23, 1997.)

(Lake Hydrology/ Lake Pollution, Karnataka, Kodaikanal lake)

H12). WATER-TESTING KIT ON DISPLAY:

The Central Pollution Control Board has displayed its recently developed water-testing kit at the ongoing India International Trade Fair at Pragati maidan.

The handy water-testing kit help measure various parameters of water pollution. The kit, priced at Rs.2,000, was a total sell-out when it was launched a few months ago, at a 50 per cent promotional price.

Among other instruments on display are: handy sampler for collecting gaseous samples and high volume sampler for collection of suspended particulate matter.

The ambient air quality data of the four metros, river water quality data of major rivers are displayed by the CPCB's computer network. The zoning atlas, covering various districts, that has been prepared by the Board is also on display.

Another major attraction for students is the 'zebra fishes' used to test toxicity in water. There are also several audio-visual programmes, information booklets, leaflets and newsletters being given free of cost of visitors.

(The Hindu, Nov. 23, 1997.)

(Water Quality, India, -)

H13). NOTICE TO GUJARAT CHIEF SECY. OVER FLUORIDE POISONING:

The National Human Rights Commission (NHRC) has issued notices to the Chief Secretary of the Government of Gujarat and the Secretary, Department of Health in a public interest litigation drawing attention to "one of India's greatest ecological disasters shaping up in Panoli village of Morbi district, Saurashtra and allied villages due to fluoride poisoning".

The NHRC has also issued notices to the Chairman, Central Water Commission (CWC) and the Secretary, Ministry of Environment and Forests as also the Secretary, Ministry of Health and Family Welfare in this regard. Lakhs of people are getting disabled due to fluorosis and are dying drinking water from wells/tubes which are contaminated in the absence of any other alternate source having not been provided by the Government, the petitioner, Mr. S.K. Sharma, a human rights advocate, has contended.

The saline and flouride contents in water are a high 4.4 mg in this area against the acceptable levels of 0.6 and 1.2 mgm per litre. The entire population of

2400 of Prempur village is affected by salinity.

The situation existing in many villages of Gujarat state is against the spirit contained in the Universal Declaration of Human Rights, particularly against the Articles 25 and 32, which secures the life and liberty of each person and also ensures a standard of living of adequate health for each and every citizen, Mr. Sharma submitted.

(The Hindu, 25 Oct., 97.)

(Water Quality, Gujarat, -)

H14). GLOBAL WARMING, BIGGEST THREAT TO COASTAL AREAS;

Global warming, which according to scientists has already set in, will bring devastating flooding, drought, serious respiratory disease and reduced food output, in almost all regions of the world.

This grim warning, is sounded by a report of an inter-governmental panel. The report comes on the eve of the eighth and final session of an international body known as the Ad Hoc Group on Climate Change being held in Bonn, Germany.

"The average rate of warming would probably be greater than any seen in the last 10,000 years", notes the report.

In Asia, the coastal areas are particularly vulnerable to climate change. India is one such country with a long coastline. The low-lying coastal plains and deltas are densely-inhabited and are intensively used. Areas depending solely on rainfall for food cultivation will be subject to severe hardship if global warming rises.

(The Hindu, 23 Oct., 1997.)

(Climatology, India , -)

H15). GLOBAL WARMING NOT A DISTANT THREAT:

The catastrophic fires currently raging in Indonesia with a crippling effect on people's health not only in the country but the region as a whole, is a result of such climatic patterns suggesting that global warming is not a distant threat.

The United Nations Intergovernmental Panel on Climate Change (IPCC) - a group of 2,000 of the world's leading scientists - had concluded in 1995 that a global warming was real, serious and accelerating. They determined that the most likely

cause was primarily from humans burning coal, oil and petrol and increasing the amount of carbon dioxide and other greenhouse gases trapped in the Earth's atmosphere.

According to the report, sea levels are rising and ocean temperatures increasing. On an average, sea levels are between 10 to 25 cms higher than a century ago. About 80 per cent of the world's beaches are eroding, often at the rate of several metres per year. Rising tides threaten the survival of many low-lying coral island nations like the Marshall Islands, Anguilla, Tokelau and the Maldives.

The WWF report states that five years ago, industrialised nations agreed to stabilise their carbon dioxide emissions at 1990 and 1996, emissions among the Organisation of Economic Cooperation and Development (OECD) nations actually rose by 7.8 per cent.

(The Hindu, 8 Oct., 1997.)

(Climatology, India , -)

H16). WORST DROUGHT IN FOUR DECADES:

Andhra Pradesh is reeling under severe drought conditions, described as the worst in the last four decades, due to failure of the North-East Monsoon (June-Sept.) which brought only 275 mm rainfall till August end this year as against the normal 442 mm.

It has found that the drought situation is grave in 250 of the total 1,200 mandals in the State. The drought has reached alarming proportions in Prakiasam and Mahaboobnagar districts.

Ironically, the Godavari, which would normally be in floods during August, is facing water shortage this year due to total failure of monsoon in the upper catchment areas of Vidarbha and Marathwada. It has the poorest inflows in the last 50 years. Paddy crop transplanted on thousands of acres under the Sriamsagar project is withering away, bringing misery to the farmers. Groundnut, which is a major crop after paddy, is also suffering badly. Cotton faces the same plight.

(The Hindu, 15, Sept. 1997.)

(Drought Management, Andhra Pradesh, Godavari)

H17). THE OTHER SIDE OF GREEN REVOLUTION:

The recent flooding of vast areas in the Muktsar district of Punjab caused by unchecked waterlogging over the years, has raised many questions. It is being debated whether the problem has been caused due to oversight on the part of those in power or as a fall-out of the phenomenon of the late Sixties or the early Seventies, which is popularly known as the "Green Revolution".

Following unprecedented rainfall in the last week of July more than 225 villages and the township of Malout in the south-western region of the State were hit and hundreds of families rendered homeless. Crops in 1.50 lakh acres have perished in water which has been standing in the fields from one to five feet deep at various places. The major crop of the area, cotton, worth Rs.1,000 crore has been lost.

The change in the cropping pattern all over the state was also accompanied by aggressive irrigation. Places such as Ludhiana, where groundwater was used for irrigation, have become water scarce, while those such as the south-western region, where canal water was used, are reeling under the impact of waterlogging which is called "sem" in local parlance. According to estimates by the State Flood Control Board, about three lakh acres of agricultural land which receives canal irrigation has either been hit by waterlogging or faces a grave situation.

Due to fears of salinity and the cost factors the farmers of the region have preferred canal irrigation to tubewell irrigation. This has resulted in the unchecked charging of the groundwater table with literally no withdrawals at all. Experts claim that up to 90 percent of the saline water can be used for irrigation in conjunction with the canal water, which can go a long way in treating the problem of brackish water also. They want detailed studies of the region to be conducted and the State Electricity Board directed to give out maximum tubewell connections in the region.

(The Hindu, Sept. 15, 1997.)

(Waterlogging, Punjab, -)

H18). THE REVENGE OF NATURE:

Floods caused large-scale destruction in the Rewa area of Madhya Pradesh between August 31 and September 2 this year. The situation was unprecedented in the sense that floods at this scale were never seen or felt for decades.

Owing to the lack of porosity of the earth, especially in the catchment areas water very soon finds its way at an unprecedented speed into the water channels (rivers or rivulets) that are already choked by silt and all that such water brings from its path.

The monsoon rains are also associated traditionally with areas now termed as waterlogged, low-lying areas which get most affected by the floods.

(The Hindu, 15 Sept. 1998.)

(Flood Hydrology, Madhya Pradesh, -)

H19). SEVERE CRISIS IN BHOPAL WATER SUPPLY:

In the summer months, because of the low water level in the upper lake as well as the pressure for meeting the irrigation needs of the farmers through the Kolar reservoir, water supply in most residential colonies here is at a low pressure and that too only once a day.

Recently, people in several residential colonies in the new Bhopal area were shocked to receive contaminated rust coloured water through their taps. This had raised alarm bells particularly because people felt that the water was contaminated by leakage in the poorly maintained water and sewage lines.

The manganese content of Kolar water was found to be around 2.5 Mgl against the permissible limit of .01 Mgl. Official sources said that the manganese content in water had come down to 1.5 Mgl and it is being further neutralised by mixing potassium permagnate and lime before it is supplied to the people.

(The Hindu, 15 Sept. 1997.)

(Water availability, Bhopal, Kolar Reservoir)

H20). FLOOD FURY IN REWA: TOLL 14

The Rewa district of M.P. is currently reeling under the impact of floods caused by a record rainfall of 326 cm registered between August 30 and September 2 this year.

According to official estimates, 2.3 lakh people residing in 400 villages of the district and 21 localities of Rewa city, have been affected by the flood fury, which has so far claimed 14 lives and caused extensive destruction to livestock, property and

standing crops. The district administration has estimated the total loss around Rs. 105 crore.

(The Hindu, 10 Sept.,1998.)

(Flood Hydrology, Madhya Pradesh, -)

H21). WATERLOGGING DUE TO DELAYED ACTION:

The colossal losses caused by the waterlogging assuming flood like situation in 1.50 lakh acres of this south western district of Punjab could have been avoided had the concerned authorities acted well in advance after their attention was drawn to it by people.

An official of the district administration admitted that had drains been constructed about four years ago this acute problem could have been avoided and water would not have overflowed in the area which was formerly famous for its huge sand dunes. The absence of drains has hampered the de-watering process in many villages which remain cut off as the fields surrounding them have been turned into large lakes.

The area had some pockets where land had been waterlogged for a few years. At most of these places the 'sem' had assumed alarming proportions about four years ago. But in villages like Ratta Khara, Inna Khara and Baring the problem has persisted for more than a decade. "Even moderate rainfall makes our lives miserable" says a farmer who has not been able to reap a single crop for the last four years.

(The Hindu, Sept.8, 1998.)

(Waterlogging , Punjab, -)

H22). PUSHED TO THE WALL OVER CAUVERY:

Karnataka had been doing a tight-rope-walk ever since the interim order was passed six years ago. It had rejected the interim order with both Houses of the State Legislature passing a unanimous resolution for its outright rejection. The State Government's position; became difficult, especially after the interim order was gazetted by the Government of India and the Supreme Court held in Nov. 1991 that the Tribunal's order constituted a report and a decision within the meaning of the Inter-State Water Disputes Act.

Karnataka's attempt to block the interim order through an Ordinance - Karnataka Cauvery Basin Irrigation Ordinance, 1991-also received a setback with the apex court's rap that the "Ordinance is beyond legislative competence and ultra virus of Article 245 (1) of the Constitution".

The State continued its fight both on legal and political planes against the interim award which provided for releasing 205 tmc ft of water to Tamil Nadu every year from June to May. But it was known that the State Government's public posture that it would not release water as stipulated in the interim order was out of political compulsion. The reality was that, however unwilling, the State was complying with the order, of course to "the extent possible".

(The Hindu, 8 Sept., 1997.)

(Interbasin water transfer, Karnataka, Cauvery)

H23). CONSENSUS SOUGHT ON GROUNDWATER USE:

The Union Minister for Water Resources, Mr. Sis Ram Ola, today appealed to State Governments to speed up their response to the Model Bill to Regulate and Control the Development of Groundwater to bring about a consensus on the optimum use of groundwater resources.

Inaugurating a one-day meet of State Water Resources Ministers, the Minister said a strategy had to be evolved immediately to tackle the implications of depletion and contamination of groundwater resources. The Centre and State Governments had to shoulder the responsibility.

The Government has set up a Groundwater Authority to regulate the control the use of groundwater. While the Authority is responsible for framing guidelines and monitoring the implementation of the Model Bill, several States have yet to enact legislation, establish a State Groundwater Authority and devolve powers to panchayats/block/tehsils to regulate and monitor groundwater use.

Legislative measures for the protection of the quality of groundwater would include directives on any activity which interferes with water quality, including the production and use of chemical products, and disposal of urban, agricultural and industrial wastes. Provisions may comprise prohibition of storage handling of solids, liquids and gases which have the potential to endanger groundwater quality,

particularly those which are toxic, persistent and bio-accumulative.

(The Hindu, 31 Aug. 1997.)

(G.W.H./ Water bills, India, -)

H24). BHIMA IN SPATE; 16 VILLAGES UNDER WATER:

Several villages on the banks of the Bhima river in Gulbarga and Bijapur districts have been affected severely due to floods, and standing crops in thousands of acres have been lost.

Official sources said here today that the flood waters had entered 16 villages in Gulbarga and Bijapur districts. The worst-affected was Afsalpur in which the flood waters had entered 10 villages and people living in low-lying areas had to be shifted to higher reaches and housed in makeshift camps in schools and other open areas in tents.

The flood waters cut off road connections to Takli, Teggalli, Sonna, Bankalga and Shivur in Afzalpur taluk and many low-areas were submerged.

(The Hindu, 29 Aug., 1997.)

(Flood Hydrology, Maharashtra, Bhima river)

H25). MAHANADI, GODAVARI SURPLUS RIVERS: EXPERTS

The feasibility plan, prepared by the experts of the National Water Development Agency for linking up the east-flowing rivers of the south by a canal along the coast under the national water grid programme, has categorised the Mahanadi in Orissa and the Godavari in Andhra Pradesh as "surplus" rivers to the extent of 280 tmc ft and 530 tmc ft respectively, and the Krishna and the Pennar in AP, and the Cauvery and the Vaigai in Tamil Nadu as deficit rivers.

The NWG or national perspective planning contemplated for equitable distribution and optimal utilisation envisages transfer of water from surplus basins to deficit ones, and has two components - the first, Himalayan component, aiming at connecting the perennial Himalayan born rivers such as the Ganga, the Yamuna and the Brahmaputra for the benefit of the drought prone areas in the north and the second, peninsular component, for linking up the east-flowing and west-flowing rivers in the south by two separate canals. The programme was conceived based on an

assessment made by the Central Water Commission according to which the country would face a shortage of 160 cubic km of water by 2050 AD with the requirement by then being 1,300 cubic km as against the present availability of 1,140 cubic km. While an estimated 1,880 cubic km of water is flowing in the rivers in a year on an average, it is being utilised only to the extent of 690 cubic km.

(The Hindu, 28 Aug., 1997.)

(Interbasin water transfer, India,, -)

H26). SOLAPUR DISTRICT FLOODED:

In the biggest-ever floods in the last 40 years, nearly half of the pilgrimage city of Pandharpur in Solapur district of Maharashtra was submerged yesterday by the overflowing waters of river Bhima.

Around 20,000 people on the banks of the river were shifted to safer places even as 70 villages were affected by the floods, district officials said adding that Ankali, Kasur, Khanapur, Tamadardi, Anjansond and Puluwadi villages were totally engulfed by flood waters.

(The Hindu, 28 Aug., 1997.)

(Flood Hydrology, Maharashtra, Bhima River)

H27). KEELPING TABS ON WATER LEVELS OF RIVERS:

Every year floods kill 1500 people and render 33 million homeless submerging eight million hectares of fertile land causing damages close to a thousand crore rupees.

But for a unique flood forecasting network, that keeps round-the-clock tab on water levels of major rivers, the damage could be much more. Comprising 157 flood monitoring stations on 62 of the country's most flood-prone river basins, the predominantly manual system has proved to be the most reliable and cost-effective way of mitigating loss due to floods, says Mr. Baljit Singh Ahuja, chief engineer, river management, Central Water Commission (CWC).

The process involves monitoring water level and flows at select points along the river basins and collecting the data to predict an impending flood upto three days in advance to evacuate people and reduce the extent of loss.

The CWC, which has devised the network, based on previous flood cycles and the time taken for the water to travel between two given points, has set red marks and danger points for all stations. Today, CWC officials claim an efficiency of more than 96 per cent as against 82 per cent 20 years ago and much less when the country's first forecasting station was set up on Delhi's old railway Yamuna bridge in July 1958.

Most of the forecasting stations are situated in 12 Northern and North-Eastern States - 80 along the Ganga and 27 in the Brahmaputra basin. Twenty-five of the stations measure inflows into reservoirs, says Ahuja, Water levels at other places are noted manually and the information passed on to base stations through wireless sets. After requisite analysis, with the help of hydrometry experts, forecast bulletins are issued and passed on to local civic authorities, as also the press, for necessary action.

Tracking of Yamuna begins at Poanta in Garhwal area on the confluence of rivers Tons, Pawar and Giri. The next important site is at Tajewala followed by Kalanauri and Mawi before Delhi. It roughly takes about 60 hours for the water to reach Delhi from Tajewala, which enables them to issue warnings at least two days in advance, he says adding that danger levels are area specific and the issuance of warnings is prerogative of local authorities.

Regretting that modern towns have by and large ignored this basic pattern of development, Ahuja says the next practical thing is to take advantage of advance information and shift people to safer places.

A Delhi Government official in charge of Flood Management says about one lakh people live along river Yamuna and face immediate threat in case of heavy rainfall in any of the catchment areas. Thanks to advance warning, early this month a major crisis was averted when over 50,000 people were evacuated much before the swelling Yamuna threatened to swallow them early this month.

(The Hindu, 23 Aug., 1997.)

(Flood Hydrology/ Flood Forecasting, India, -)

H28). 135 FEARED DEAD IN HIMACHAL FLOODS:

Nearly 135 people were feared killed in flash floods triggered by cloudbursts in Shimla and Kinnaur districts of Himachal Pradesh last night.

The floods also hit the adjoining Ghusali village, Neogli and Manglad areas

in Shimla district and Wangtoo area in tribal Kinnaur district in the dead of night, damaging several government and private buildings, washing away bridges and long stretches of roads and triggering landslides.

A 7-km area between Wangtoo and Tapri, 200 km from here upstream of Sutlej, had been converted into a lake due to blockade of the river near Wangtoo and the entire area including the Hindustan-Tibet National Highway, stood submerged under water.

The Andra river in Chargaon changed its course and its gushing waters washed away half of the bazaar, a fishery farm, several government buildings, three bridges and a 1-km stretch of road snapping all communication with the tehsil headquarters at Rohroo.

The rain have caused colossal damage in other parts of the State and several areas have been cut off due to landslides and road breaches. The district headquarters town of Chamba was cut off due to massive hillslips on the Chamba-Pathankot highway.

(The Hindu, Aug. 13, 1997.)

(Flash flood, Himachal Pradesh, Andra river)

H29). POLLUTION STILL THREATENS SAFE DRINKING WATER:

The Government last week claimed that 95 per cent of the rural population now has access to safe drinking water. Of the 14.31 lakh piped water supply systems, only about 50,000 habitations were yet to be supplied potable drinking water.

However, the bacteriological and chemical pollution of protected drinking water sources posed a serious threat to public health. According to one estimate, over 43.5 million people face risk from arsenic, fluorosis and iron contaminants. A nation-wide habitation survey had shown that 1.42 lakh habitations faced problems of quality drinking water because of excessive flouride, arsenic, salinity and iron content. More instances of chemical and biological contamination were expected to come to light when a systematic water quality testing mechanism was introduced.

(The Hindu, 13 Aug., 1997.)

(Water Quality/ Potable water, India)

H30). SEMINAR ON WATER MANAGEMENT:

Pani Morcha, a Non-Governmental organisation, today made a presentation on water management at Raj Niwas.

The presentation highlighted projects like afforestation in the Ridge area and development of eco-parks for bio-chemical treatment of sewage. The Morcha suggested creation of reservoirs for harvesting flood and rain water so that availability of clean water could be improved.

It also mooted proposal for revival of village ponds and old quarry pits for storage of water and improving recharging of underground aquifer. Following the presentation, the Delhi Government decided to constitute a core group, under the Chief Secretary to formulate projects for afforestation and harvesting water.

(The Hindu, 8 Aug, 1997.)

(Water management, India, -)

H31). BIHAR FLASH FLOOD CLAIMS FOUR LIVES:

Large areas of Gaya district were inundated yesterday following flash floods caused by breach in the embankment of the Mahane river.

In Jamshedpur, 20,000 people were affected as a flash flood in the Subarnarekha and Kharkai rivers inundated vast areas.

The District Administration alleged the flood was caused due to the release of water from the Chandil Dam in Singhbhum district with no prior intimation.

In Midnapore district, flash floods following torrential rains have claimed three lives and affected at least 1,00,000 people.

(The Hindu, 7 Aug. 1997.)

(Flash Flood, Bihar, Chandil dam)

H32). FLOODS, LANDSLIPS LEAVE 10 DEAD:

Flash floods and landslips sparked off by heavy rains left 10 persons dead and two others missing in three villages of Tehri Garhwal district on Sunday while many interior roads and property worth several crores have been damaged.

(The Hindu, 5 Aug. 1997.)

(Flash Flood , Uttar Pradesh)

H33). RAJASTHAN STEPS TO COMBAT WATERLOGGING, SALINITY:

The State Government has launched a new project - the agriculture underground water development research project - with foreign technology and assistance to solve the perennial problem of waterlogging and salinity in the Chambal command area of south-east Rajasthan.

An official announcement here today said that while formulating the project, the environment research programmes based upon international norms had been fully taken care of. Different aspects of environment in the project area had been studied and an action plan for protecting the environment prepared.

The project officials have found, on examination, that salinity in the water pumped out in this manner has not increased much and there has been no adverse impact on the ecological balance in the area. The water can be used normally for farming and the benefits of the project would occur to all sections of the farming community.

(The Hindu, 3 Aug., 1997.)

(Waterlogging/Soil salinity, Rajasthan, Chambal Command area)

H34). KRISHNA SWELLS, FLOOD THREAT IN BELGAUM DT.:

The Krishna, which flows for about 70 km. in Belgaum district, has been swelling, Round-the-clock monitoring of the situation in Athani, Raibag and Chikodi taluks, is being done by tahsildars. Ingali in Chikodi taluk and Diggewadi in Raibag taluk might be surrounded by water soon.

Apart from heavy rain, the release of 1.13 lakh cusec of water from the Koyna Dam in Maharashtra, and the swelling of the Varana, the Koneri and the Dhom rivers, which join the Krishna in Chikodi taluk, has caused the main river to rise. The tahsildars visited the flood-prone villages and made preparations to tackle floods.

Another river, which is causing concern is the Hiranyakeshi, a tributary to the Ghataprabha. The river water has entered the Shankarlinga Math and houses in Math Galli in Sankeshwar on Pune-Bangalore National Highway. It has submerged the Badakundri bridge, disrupting road traffic in parts of Hukkeri and Chikodi taluk. The 10 gates of the Hidkal Dam have been opened following an inflow of 50,000 cusec into the reservoir. The level in the reservoir stood at 2,172.20 ft. against its

capacity of 2,175 ft.

In Khanapur taluk, the halagi, the Mahadayi, the Mangotri and Pandhari and nalas and streams in the taluk are in spate. The taluk has received so far 1,325 mm rainfall, including 713 mm received in July.

Meanwhile, there was respite for the people of Belgaum from incessant rain, which lashed the city for four days since July 28. During this period the city received a record 165 mm rainfall.

Several houses in low-lying areas such as Shastri Nagar in Shahapur, Shivaji Colony and Gandhi Nagar in Belgaum and Maratha Colony were inundated with water. At least 20 houses collapsed.

(The Hindu, 3 Aug., 1997.)

(Flood Hydrology, Karnataka, Krishna river)

H35). CONSERVING RAIN WATER TO OVERCOME SCARCITY:

The age-old methods of saving water in brick tanks and mud ponds could help India overcome growing water shortage in towns and cities.

Indians consume all the 19-billion cu metres of available water every year even as about two thirds of 4,000 cu km. of annual rainfall flows down the drain.

Water saved is water gained, say experts, suggesting harvesting rain water to meet an estimated annual requirement of 1,050 cu km in 2025, double of that needed in 1985.

"It is time to rediscover old ways of water management - rain water harvesting being one of them", says Ms. Iqbal Malik, Director, Vatavaran, an NGO, adding this can be done through construction of mud dams, check dams ponds, wells and small lakes. The Central Ground Water Board, Chandigarh, has started a pilot project in Jawaharlal Nehru University here, to harvest rain water for artificial recharging of the ground water.

In the past two years, 45,000 cu m of water has flown into shallow and deep aquifer and 1,000 cu m was lost in evaporation, according to Dr. Jagdish Lal, Public Relations Officer, JNU.

Of the total quantity of water resource available, 98 per cent has recharged aquifer. This additional resource of ground water would be sufficient for 1,200 persons

over one year, taking 100 litres, per day, per capita, for domestic use, he says.

Rain being the main source of water, excess water was stored through construction of check dams (since 1994) as these over a period of time recharge underground water also, Dr. Lal says.

Increasing water tariff, making tanks for collecting rain water on top of new buildings and waste water treatment plants in every area can help manage available water and replenish the depleting sources, Ms. Malik says.

Delhi has India's highest per capita consumption of 257 litres of water, per day. Over 60 per cent of the water used is unaccounted for, 20 per cent is properly used and the remaining 20 percent is wasted.

(The Hindu, 1 Aug., 1997.)

(Water Harvesting, General)

H36). MULTI-CRORE WATER PROJECT FOR RAJASTHAN:

The Rajasthan Government will spend Rs. 147.5 crores on supply of potable water to urban areas in the desert State during 1997-98. The outlay for drinking water in the State in the Ninth Five Year Plan for urban and rural areas would be Rs. 775 crores and Rs. 964 crores respectively.

The Government also plans to spend Rs. 55 crores during the current financial year on a project for potable water sanctioned for Churu, Hanumangarh and Jhunjhunu districts with financial assistance from Germany. The project's total cost has been estimated at Rs. 253 crores.

Besides ensuring daily water supply in Ajmer, Beawar, Kishangarh, Kekri and Nasirabad, about 220 lakh gallon water was supplied daily to Jodhpur from the Jodhpur lift canal. A plan of action with an expenditure of Rs. 25 crores was proposed to solve the problem of saline water in Sriganganagar and Hanumangarh districts - benefitting at least 260 villages.

(The Hindu, 25th July, 1997.)

(Potable Water, Rajasthan, -)

H37). SHOW-CAUSE NOTICE OVER CANAL POLLUTION:

The Rajasthan State Pollution Control Board has issued a show-cause notice

to Chambal Fertiliser and Chemicals Limited, situated in Gadepan village near the industrial city of Kota, following reports that a huge quantity of untreated polluted water released by it had allegedly killed hundreds of fish and other aquatic animals in the nearby Rugdhi canal.

The Board's environmental engineers, who visited the site on Monday, have reportedly found that the ecological system of the 50 km long canal has been completely destroyed and the possibility of herds of cattle being affected by the polluted water in the coming days cannot be ruled out. The villagers have already reported the death of at least two cows which must have drunk the canal water.

(The Hindu, 24 July, 1997.)

(Water Pollution, Rajasthan, Rugdhi Canal)

H38). A 'FISHY' PROBLEM IN NAINITAL LAKE:

Fish have become the first casualty of pollution in the Nainital lake. A large number of fish died due to lack of oxygen and food in the lake over the week-end.

The authorities attribute the mass deaths to fog but experts of the G B Pant University of Agriculture and Technology who conducted a study over the past two days say the cause of deaths was lack of oxygen and lack of germs eaten by this species of fish. The germs population declined due to lack of oxygen, they said. The oxygen level in the lake waters was found to be as low as 2 parts per million (PPM) yesterday while it should be between 3 to 4 PPM.

The main reason behind the decrease in oxygen levels in the lake waters was the unchecked flow of sewage water from the city and dumping of garbage by unscrupulous entrepreneurs living around it. The pollution in the lake had further increased because of continued construction of unauthorised buildings around it despite the Supreme Court ban.

(The Hindu, 22 July, 1997.)

(Lake Hydrology/ Lake Pollution, Uttar Pradesh, Nainital lake)

H39). PACT ON TEESTA WATERS ON ANVIL:

India and Bangladesh have agreed to work towards an agreement on sharing waters of river Teesta and to implement "every word" of the Ganga water treaty

signed in December last year. The unanimity was reached at the 32nd meeting of the India-Bangladesh Joint Rivers Commission which met here on July 19 and 20 after a lapse of seven years.

The Indian Water Resources Minister, Mr. Sis Ram Ola, who led the country's team in the meeting said on conclusion of the meeting that New Delhi would do everything for the implementation of the Ganga water sharing accord, signed last year. The Bangladesh team was led by its Water Resources Minister, Mr. Abdur Razzak. The 30-year Ganga water treaty ran into trouble in the first year after Bangladesh reported meagre flow from the upstream during the last dry season.

When a reporter drew his attention to the problem faced by Bangladesh during March in the implementation of the accord. Mr. Ola said it was due to "technical reasons" and added that a committee had been formed to look into the matter, "There will be no problem in future," he said.

(The Hindu, 21 July, 1997.)

(Interbasin water transfer, Indo-Bangladesh, Ganga & Teesta rivers)

H40). HOW DAMS WEAKEN THE OCEANS:

The large number of dams in operation around the world today could affect the cycling of materials in coastal seas. This is the finding of research conducted by scientists at the Hamburg University who studied the effect of Danube river dam on the Black sea ecosystem recently.

The research supports the fact that manmade barriers are trapping vital nutrients suspended in the river water and preventing them from reaching the oceans. Scientists warn that fishes will disappear and rising tides of toxic algae would float across ocean waters if what happened in the Black Sea is repeated in the other major oceans.

The river Danube, which contributes 70 per cent of the river inputs into the Black Sea, was dammed in 1970-72 approximately 1000 km upstream at the Yugoslavia/Romania border by the 'Iron Gates' causing significant changes in the Danube's discharge pattern.

The results published in Nature revealed that water and sediment storage in reservoirs behind the 'Iron Gates' have altered the bio-geo-chemistry not just of the

river and the adjacent coastal waters, but also of the entire Black Sea basin. The observed species shift towards carbonate producing coccolithophores in the coastal waters (most certainly caused by decrease in silicate) exerts significant control on seawater chemistry such as alkalinity and pH. Furthermore, the occurrence of potentially toxic flagellate blooms may become more frequent, as observed in other coastal areas. Similar effects may be expected for the central Black Sea where, in contrast to pre-dam conditions, silicate depletion appears not to be more frequent.

(The Hindu, 17 July, 1997.)

(Dam Hydrology, Black Sea, Danube river dam)

H41). KELO RESERVOIR PROJECT STILL IN SURVEY STAGE:

More than 31 years after it was mooted, the Kelo Reservoir project in the tribal-dominated Raigarh district in Chhattisgarh region of Madhya Pradesh has not proceeded beyond the survey stage.

Officials here said that during these 31 years, the cost of the project has risen steeply from Rs. 18 crores to Rs. 110 crores but still there were no signs of it reaching an early completion.

Despite the inordinate delay, there is a view that the project would be useful since it would irrigate an area which is at present causing an annual loss of Rs. 25 crore.

The Kelo Reservoir is proposed to be located at a distance of eight kms from Raigarh and it would have a height of 43.35 metres and a length of 253.41 metres. The project on completion would irrigate 83,000 acres in Raigarh district and more than 3,000 acres in Bilaspur district.

(The Hindu, 14 July, 1997.)

(Irrigation, Madhya Pradesh, Kelo Reservoir Project)

H42). WATERSHED MANAGEMENT CAMPS IN DOON VALLEY:

These camps were organised at Dak Pathar, Rajpur and in Almora by HARC which is working in the field of natural resource management and human resources development in the Uttarakhand region. Watershed is a hydromorphic natural manageable unit of the drainage network of the river which is selected for

integrated area development of existing resources.

In this approach, development is not confined to the agricultural lands alone but covers the entire area, starting from the highest elevations and down to the outlet of the main drainage line.

The Central Soil and Water Conservation Research and Training Institute, based in the Doon Valley, has played a pioneering role in popularising the watershed approach through research, demonstrations and training courses over the past few years.

The Central Soil and Water Conservation Research and Training Institute and its regional centres had undertaken three operational research projects of watersheds at Fakot, Sukho Kajari and Chittal Durga.

Work involved in watershed management is making fibre and fruit plantations in the denuded land forms of the watersheds, construction of erosion control structures like checkdams, graded bunds, construction of small farm ponds, spring ponds, adoption of appropriate cropping systems and water resource management practices.

(The Hindu, 5 July, 1997.)

(Watershed Hydrology, Uttar Pradesh, -)

H43). GUJARAT FLOOD TOLL RISES TO 164:

With seven more deaths reported from five districts today, the toll in the current heavy rains and floods in Gujarat rose to 164 including 43 people still reported missing.

In Ahmedabad, the situation was still far from normal with both the eastern and western parts of the city remaining under water. The civic authorities were taking necessary steps to drain out the accumulated water but still about 50,000 people from the affected housing colonies were staying in make-shift shelters.

(The Hindu, 1 July, 1997.)

(Flood Hydrology, Gujarat, -)

H44). EXPERT COMMITTEE TO STUDY WULLAR, MANASBAL LAKES:

The Union Environment and Forests Ministry will depute an Expert Committee

to draw up a comprehensive plan for development of the famous Wullar and Manasbal lakes in the Kashmir Valley.

The Expert Committee will work in close collaboration with the State Government for the development of the Wullar lake, the biggest natural lake in Asia. He said a massive plantation programme was urgently required to revive the pristine glory of the areas around the Wullar lake, which had been destroyed during the last eight years of militancy.

(The Hindu, 1 July, 1997.)

(Lake Hydrology, Jammu and Kashmir, Wullar and Manasbal lake)

H45). RANCHI HEADING TOWARDS ENVIRONMENTAL CRISIS:

Ranchi, once known as the summer capital of Bihar for its salubrious climate, is gradually drifting towards a major environmental crisis due to the absence of a waste disposal management system for the city.

A study conducted by the environmental engineering department of Mecon, suggested that Ranchi had neither a sewage collection network nor sewage treatment system. Generally in most houses and buildings toilet wastes were connected to the open drains through septic tanks and all other waste waters from kitchens, bathrooms and wash basins were directly discharged into the open drains.

Out of the various methods mentioned, Ranchi city could have sanitary land filling and composting methods for solid waste disposal, the study said composting method was preferable because it could dispose of solid wastes and side by side generate fertilisers.

The Ranchi lake receives domestic sewage from the adjacent areas as also the catchment areas of Kanke dam.

Moreover, the study says, the municipal solid wastes and hospital wastes from Ranchi were being disposed of for filling low lying areas which is against the waste disposal norms.

(The Hindu, 27 June, 1997.)

(Environmental Hydrology, Bihar, Ranchi lake)

H46). RAIN WREAKS HAVOC IN GUJARAT:

The entire Mehsana town in north Gujarat and about 150 villages in various parts of the State remained surrounded by flood waters after three days of incessant heavy rainfall.

At least 75 villages in Sabarkantha district, also in north Gujarat, and about 45 villages in Surendranagar district in the Saurashtra region were also surrounded by accumulated rain waters and efforts were being made to air drop food packets to the affected people.

The Chief Minister said the problem created in Mehsana town was not because of any dam burst but because of unlimited new construction of houses blocking all escape routes of rain waters. The town, like most other major cities in the State, have no storm water drainage system as such heavy rains was usually unheard in this part of the country.

(The Hindu, 27 June, 1997.)

(Drainage Hydrology, Gujarat, -)

H47). RAINFALL INCREASING IN MANY CITIES:

A study by a group of weather experts of the India Meteorological Department (IMD) has confirmed that deforestation led to a decrease in rainfall over hilly regions, while urbanisation and industrialisation affected the local climate in the form of increased precipitation.

The study, which compared the rainfall in different parts of the country during 1931-60 and 1961-90, has found that even as the variations in annual and seasonal rainfall were not significant when the country as a whole was considered, some hill stations had a significant decline in rainfall, while several cities experienced increased rainfall. The hill stations, which had been found to have decreasing rainfall included Ootacamund, Kodaikanal, Mercara, Shimla, Darjeeling, Dharmasala, Dalhousie, Pachmari, Mukteswar, Mahabaleshwar, Abu and Aijal.

The cities faced with increasing rainfall included Delhi, Chennai, Mumbai, Calcutta, as also Bangalore, Hyderabad, Surat and Dhanbad.

(The Hindu, 24 June, 1997.)

(Forest Hydrology, India, -)

H48). THE AGENDA 21 FOR THE NEW MILLENNIUM:

Five years ago on June 5 in Rio de Janeiro, Brazil, a plan for a new earthly order, the Agenda 21, was prepared with the hope it would make the world sustainable sometime in the 21 century. Today, as the World Environment Day, is being celebrated, and the Rio-5 evaluation completed, the inexorable march of environmental destruction continues, unabated and, in the long run, it may even endanger the human existence, according to a press release from Dr. Rashmi Mayur, director, International Institute for Sustainable Future, Mumbai.

Even though five years are minuscule in the history of time, when crises are grave, reconstruction and new developments demand urgency. The story of the last five years in India is self-evident.

Now the task is to prepare for sustainability in the new millennium - hardly three and a half years away. The country's land is undergoing down transformation. If the Indians, as a civilized society, are to survive, there must be a vision of the kind of India required for its children, say by 2010 A.D. or 2025 A.D. National goals of sustainable development in all areas- economic, social and environmental must be set. Priorities must be based on the limited resources, must be set for dealing with such vast complex problems of poverty, hunger, pollution, slums, endangered species, deforestation, uncontrolled population growth, diseases, etc. The Agenda 21 for the New Millennium is what is needed - for the country, for every city and every community.

(The Hindu, 5 June, 1997.)

(Environmental Hydrology/ Water Management, India, -)

H49). FORESTS MINISTRY TO MONITOR DAL LAKE RESTORATION:

The world famous Dal lake has been taken into the Central sector and the Union Ministry for Forests and Environment would monitor the utilisation of funds to be allocated to the State to restore the dying lake.

Preservation of the Dal lake, Prof. Soz, said, was being funded equally by the State and the Centre but the paucity of funds in the State sector had halted the plans. That was why the Centre had agreed to bear the total cost for preserving the lake. The project expected to cost around Rs. 334 crores had already been submitted to

the Union Government and stands cleared by the Planning Commission, "but to make the project much better a team of Austrian experts will review and update the project".

The Wular lake, the biggest fresh water lake in Asia and the Ramsar site, would be taken up as special cases under this plan, he said. He added that lake preservation would not involve engineers alone.

(The Hindu, 4 June, 1997.)

(Forest / Environmental Hydrology, Jammu and Kashmir, , Dal Wular lake)

H50). MASTER PLAN TO PROTECT MAJULI:

The Brahmaputra Board has been asked to prepare a master plan to protect from erosion the world's biggest river island Majuli in upper Assam.

The board has initiated a pilot project worth Rs. 65 lakhs for the purpose, the Flood Control Minister, Mr. Promod Gogoi said here on Thursday.

(The Hindu, 31 May, 1997.)

(Soil Erosion, Assam, Majuli river Island)

H51). DROUGHT IN KALAHANDI MAN-MADE, SAYS OXFAM:

Only revival of traditional irrigation systems in Kalahandi, which was once surplus in foodgrains, can save the region and its people from recurring droughts, says OXFAM. and NGO working in the area through community based organisations. It says the drought in Kalahandi is "man made", more as the result of exploitation of the tribal population and neglect of traditional irrigation systems, than because of drop in rainfall this season.

(The Hindu, 30 May, 1997.)

(Drought Hydrology, Kalahandi, -)

H52). RAJASTHAN BID TO SAVE GROUNDWATER:

Alarmed at the heavy depletion of groundwater resources in this water-scarce State, the Rajasthan Government decided to enact a legislation to regulate use of groundwater and prevent its misuse. Titled the Rajasthan Groundwater (Regulation) Bill 1997, it envisages wide ranging powers to the Competent Authority - the District Collector or SDM-to order closure of wells and tanks both private as well public

sector. The Bill is expected to be introduced in the next session of the Assembly.

The proposed legislation would make it necessary for the registration of existing wells in the areas notified as "water scare" by the Collector.

A new well sunk in a notified area also has to be registered with the Competent Authority. Irrespective of the provisions laid down in the Rajasthan Tenancy Act, 1956, and the Rajasthan Tenancy Act 1955, the Competent Authority, if found necessary, through a notification can declare an area as "over exploited" and prohibit extraction and use of groundwater from existing wells or stop sinking of new wells in the area.

A spokesperson of the PHED, Rajasthan, said with the low recharge as against extraction of groundwater and gradual lowering of the water level every year, immediate remedial measures were called for. The over exploitation of groundwater resources, again would result in quality degradation, especially in the desert, or the areas affected by inland salinity hazards.

There is reason for concern as in 11 years the number of blocks in the State categorised as "dark zones" has gone up from 33 in 1984 to 109 in 1995. Area-wise the dark zones now cover over 92,285 sq km compared to 18,000 sq. km in 1984. As such there is no perennial river system in the State other than the Chambal and the Mahi. The climate is arid and semi-arid with scanty and unpredictable rainfall contributing to the slow groundwater recharge.

The pace of groundwater exploitation has been increasing over the past two decades whereas the area contributing to the recharge has been shrinking.

According to the Rajasthan Ground Water Department, Jodhpur, the depletion of water level has been noticed in 67 per cent area of the 2.13 lakh sq. km. land identified as groundwater worthy. Of this, in 39 per cent area, depletion of more than 3 metres has been recorded. Though a rise in water level was observed in mainly the command areas of the Indira Gandhi Nahar Project, despite normal monsoons a declining trend was noticed in all other zones.

Steep decline in water levels has been noticed near big cities and major towns with several fresh aquifers indicating a downfall ranging from 10 metres to 30 metres.

The trends over the past 12 years indicate that as many as 13 districts in the eastern and central part of the State such as Alwar, Bharatpur, Jhunjhunu, Jaipur,

Dausa, Ajmer, Sawai Modhopur, Sikar, Nagaur, Jodhpur, Chittorgarh, Rajasamand and Jalore come in the "danger category" in a classification of three. Several areas in these districts have problem of groundwater salinity and high concentration of hazardous constituents like flouride and nitrate.

(The Hindu, 24 May, 1997.)

(G.W.H., Rajasthan, -)

H53). RS. 9.80 CR. PLAN TO SAVE DAL LAKE:

A Rs. 9.80 crore plan to protect the Dal lake from increasing human encroachment and environmental pollution has been drawn up by the Jammu and Kashmir Government.

Environmentalists fear that the lake would disappear by the next century unless immediate steps for its protection are taken.

The water expanse of the lake has shrunk from 13 sq. km. to 11 sq. km.

The State Minister for Housing and Urban Development, Moulvi Iftikhar Hussain Ansari, said today the main task under the Dal development programme would be removal of encroachments, proper rehabilitation of Dal dwellers and desilting of the water body.

The Minister said foreign consultancy and expertise besides financial assistance would be sought to check the growth of dangerous algae bloom in the water.

Situated 1,580 metres above the sea level, east of Srinagar, the lake looks beautiful on the face of it but its water has turned into a cesspool of filth, due to release of contaminants over the years.

The crystal clear water have turned red due to the appearance of red algae believed to be the first sign of the lake drying up. Biologically known as Fuglena Rubra, the single celled organisms have turned the water toxic and it is no longer safe even for fish breeding.

Some experts attribute the change in colour to mechanical de-weeding while others believe that lack of circulation of water in the past few years is responsible.

The pollution in the lake has not only been caused by the Government's neglect but also by the lack of basic civic sense on the part of the people, experts say.

The first encroachment inside the lake took place in the sixties when "Nehru

Park", a tiny island, was constructed by the Government.

At present, there are more than 1,100 registered houseboats in the lake which until 1989 added to the refuse generated by more than 7,000 tourists during the Tourist season apart from that of 10,000 residents. Alarmed by the prospects of "death of Dal", a high powered Dal Development Board formulated a Rs. 800 crore project late seventies. But it never took off.

Again in the Eighties, the State Government formulated a Rs. 200 crore, four-phase, Dal development project which could not be implemented because of militancy.

When the lake turned red in August 1991, even the militants assured the authorities that they would not be hurdle in their efforts to protect the lake.

(The Hindu, 21 May, 1997)

(Lake Hydrology, Jammu and Kashmir, Dal lake)

H54). HC NOTICE TO HARYANA ON POLLUTION OF YAMUNA:

The Delhi High Court has expressed concern over the high pollution of the Yamuna water and today asked the Haryana Government to file a reply to an allegation that the industries on the banks of Yamuna in that State were the major cause.

Dr. Wadhera has alleged that large-scale use of pesticides and fertilisers by farmers in Haryana, as well as the discharge of untreated effluents into the Yamuna by the industries had rendered the water unfit for human consumption.

One of the documents placed before the court has said that a senior scientist in the Haryana Department of Environment, conceded that large quantities of pesticides and fertilisers had entered the river as it traversed through the state before entering Delhi. According to the document, the Haryana Government had made no study of the extent of pollution caused to the river within the state.

The CFCB said "there is an urgent need to alleviate pollution of water of Yamuna, otherwise the health of Delhi's residents is at risk". The pollution of the Yamuna river from domestic discharges from Delhi, Ghaziabad, Noida, Faridabad, Mathura and Agra has rendered the river unfit for any beneficial use. Until stringent measures are taken to alleviate these pollution loads, the raw water quality at Agra

cannot be improved and there is always a high risk of any epidemic in Agra." the CPCB said.

On the effluence discharged by distilleries in Haryana, the CPCB even after treatment it should not be allowed to be routed into the river as it contained high organic load.

"Therefore, all the five distilleries along the Yamuna - the Haryana distilleries along the Yamuna - the Haryana distilleries at Yamunanagar, the Panipat Cooperative Sugar and Distillery at Panipat Cooperative Sugar and Distillery at Panipat, the Haryana organics at Samalkha (Panipat), the Frost Alcon at Sonapat and the Ashoka Distilleries at Faridabad - should be immediately asked to stop their discharges in the drain or open field as being practised today". the CPCB suggested.

(The Hindu, 13 May, 1997.)

(Water Pollution, Haryana, Yamuna)

H55). GANGA ACTION PLAN: PROMISES UNFULFILLED:

Ten years after the cleansing of the Ganga began, the river waters still fall below the "bathing class standard", as the first phase of the Ganga Action Plan (GAP) ends reaching only fifty per cent of its target.

The project with its principal objective to improve the water quality of the Ganga had many achievements to its credit.

Water in major towns like Rishikesh, Kanpur, Varanasi, Patna, Allahabad which was recorded containing a high percentage of Bio-chemical Oxygen Demand (BOD) and Dissolved Oxygen (DO) rendering the water fall below "bathing class standard" improved in towns where works of interception and diversion works were taken.

For bathing class standard, the BOD and DO content of river water should be 3 mg/l (milligram per litre) maximum and 5 mg/l minimum respectively.

The level of BOD and DO which was 1.67 mg/l and 8.1 mg/l in 1986 in Rishikesh improved to 2.03 mg/l and 9.64mg/l in 1994. In Allahabad the BOD level which was 15.50 mg/l in 1986 came to 3.57 mg/l in 1994.

Sewage interception work showed some encouraging trend initially at Patna. BOD and DO percentage which was 2.20 and 8.1 mg/l in 1986 came to 1.55 and 7.18

mg/l in 1994.

In Kanpur the BOD content in 1986 was 15.50 mg/l which registered little improvement by remaining at 8.52 mg/l in 1994.

Numerous reasons were recorded for causing the spread of filth and dirt in the Ganga. Nearly three-fourth of the pollution of the Ganga water was on account of discharge of municipal waste water or sewage. The remaining one-fourth pollution was mostly from the discharge of industrial effluents from 68 gross polluting industries identified along the Ganga, a Ganga Project Directorate report says.

Tannery industries in Kanpur through discharge of its waste into the Ganga were widely reported to be causing immense pollution in the river.

The second phase of GAP, apart from carrying the left-out targets of first phase, has planned a more elaborate approach.

Important tributaries of the Ganga like the Yamuna, Gomti and Damodar which directly discharge into it and are heavily polluted are taken up for pollution abatement programmes.

Work has begun in this direction and a pollution abatement programme on the Yamuna including Hindon and Gomti have been sanctioned by the Centre at a cost of Rs. 421 crore.

The Programme was launched at Delhi on June 5, 1993, and would cover seven towns of Haryana (Yamuna Nagar, Jagadhari, Kamal, Panipat, Sonapat, Gurgaon and Faridabad). eleven towns of Uttar Pradesh (Saharanpur, Muzaffarnagar, Ghaziabad, Noida, Mathura, Vrindaban, Agra, Etawah, Lucknow, Sultanpur and Jaunpur) and Delhi.

In addition to carrying technological recourse to achieve the target, officials are making efforts in educating people to maintain purity of the river.

(The Hindu, 10 May, 1997.)

(Water Quality, Uttar Pradesh, Ganga river)

H56). GROUNDWATER EXTRACTION SHOULD NOT EXCEED RECHARGE RATE:

Groundwater is a renewable resource, but it is not inexhaustible and the rate of extraction should not exceed the rate of recharge. This fact was driven home today by experts from various parts of the country at a workshop on the methodology and

functioning of the newly constituted Central Groundwater Authority, organised by the Union Ministry of Water Resources.

The actual regulation and control of groundwater is with the State Governments, but States have not responded with enthusiasm to the Ministry's 'model bill' for regulation and development of groundwater, the Secretary, Water Resources, Mr. Mata Prasad, indicated while inaugurating the workshop here. One of the objectives of the workshop with full participation from States was to elicit their views on the 'Model bill' on groundwater management.

The workshop was held in response to a Supreme Court directive to the Government to constitute the Central Groundwater Board as an authority which would regulate indiscriminate boring and withdrawal of groundwater. It would be empowered to invoke penalties for defaulters.

The Central Groundwater Authority was notified on January 14 for a year and in its meeting in February decided to organise a high-level workshop with participation from State Governments to draw a strategy to implement the Supreme Court order.

However, to bring about equity in distribution of the resource, the small and marginal farmers have been exempt from seeking prior permission for the construction of a well/tubewell provided the water is intended to be used exclusively for personal purposes excluding commercial use.

(The Hindu, 9 May, 1997.)

(G.W.H., India, -)

H57). CONCERN OVER MOVE TO DIVERT BRAHMAPUTRA:

A Rajya Sabha member today expressed serious concern over reports that some Chinese engineers had proposed diversion of the Brahmaputra in Assam with the help of nuclear devices.

Raising the issue during zero hour, Mr. Parag Chaliha (AGP) asked the Government to spell out measures to meet the situation.

The proposal would threaten the country's security and lead to shortage of water in both India and Bangladesh.

(The Hindu, 8 May, 1997.)

(Nuclear Hydrology, Assam, Brahmaputra)

H58). INTACH MOVE TO TACKLE WATER CRISIS:

With the fast depletion of ground water resources in the National Capital Region and the threat of an acute water crisis staring in the face of the people in Delhi and other adjoining areas, the Indian National Trust for Art and Cultural Heritage (INTACH) has come up with new ideas to harvest rain and flood water at the urban and regional levels and enhance ground water recharge and conservation.

Releasing the recommendations of the special task force that had been constituted following a seminar organised by INTACH and sponsored by the Central Ground Water Board, Central Water Commission and the Delhi Water Supply and Sewage Disposal on November 22-23, Mr. Asish Banerjee, INTACH Secretary, said that the surface water resources of the NCR were insufficient to meet the requirement of the various sectors.

The problem, Mr. Banerjee said, was acquiring alarming proportions with the death of the underground water storage system. With the level of underground water receding to alarmingly low levels, 80 per cent of the aquifers have been damaged beyond repair.

According to the report prepared by experts, water should be considered a national asset and strategies must be evolved to enable greater inter-state coordination. Taking the example of the Najafgarh Block where the ground water level has receded to alarming levels, the report says that a transfer of surplus flood waters to the western parts of the NCR would help to solve the acute water crisis in the area.

All wetlands should be identified and conserved as ground water sanctuaries, village ponds and other major depressants and quarries be identified and their catchment area be preserved.

The report also recommended that a protected area status be given to all flood plains and the channelisation of the Yamuna be avoided at all costs to maintain the recharge of all fresh water aquifers underlying the flood plains. Flood plain reservoirs should be created on or along the river at suitable locations to harvest excess discharge in the monsoon season.

Besides the report also suggest that water be brought under the Union List and till this is achieved a forum should be created to anticipate inter-state problems and

promote collaborative solutions for water deficient areas.

(The Hindu, 8 May, 1997.)

(Water Harvesting/Water crisis, Delhi, Yamuna)

H59). RANCHI FACING ACUTE WATER SHORTAGE:

Inhabitants of Bihar's summer capital are facing acute water crisis though the peak hot weather is yet to set in.

Mr. Nitish Priyadarshi, a geologist of Ranchi University who carried out a study of the water scarcity problems in South Bihar, said that extensive deforestation and industrialisation had led to uneven spread of rainfall, on which the water supply from three dams to the town and its neighbouring areas depended.

Sedimentation in these dams had affected the water table and reduced its storage capacity.

The uneven topography of the Ranchi plateau causes loss of rain water through surface run-off leading to lesser percolation.

The thinning of the soil layer due to physical weathering has resulted in its poor water retaining capacity, which had become a major reason behind the drying up of the hand pumps of the region, Mr. Priyadarshi said.

Widespread indiscriminate deep boring had also pushed down the water table as the metamorphic rocks of the plateau area are relatively impermeable and poor aquifers, allowing water level to barely exceed ten metres.

The geologist said that the big buildings in the recharge area of the town prevented the percolation of water in the soil. The situation was compounded by increasing pollution through discharge of wastes in the ponds and lakes, which made the water unfit for consumption.

Priority to identifying of the recharge areas and checking of construction on such areas, periodical cleansing of ponds, lakes and dams to enhance their water storage capacity and proper consultancy to determine suitable spots for deep boring and hand pumps, besides plantation and afforestation were the remedial measures, he has suggested.

(The Hindu, 6 May, 1997.)

(Water crisis, Bihar)

H60). M.P. FACING ACUTE GROUNDWATER PROBLEM:

Madhya Pradesh is confronted with the serious problem of a rapidly falling watertable and poor availability of groundwater despite the fact that it is drained by the Ganga, Narmada, Mahanadi, Godavari, Mahi and Tapti river basins.

The Chief Minister, Mr. Digvijay Singh, after touring almost every part of M.P. in the last week of April, informed newsmen that the groundwater problem had become so acute in M.P. that it could not be tackled merely through watershed management.

The Environmental Status Report-1996 prepared by the Environmental Planning and Coordination Organisation (EPCO) says that the gross groundwater recharge, in all the river basins of MP, is about 486 million ha m/year and the recoverable quantity of the groundwater is worked out at 243 million ha m/year.

The groundwater utilised in the State has been computed as 55 million ha m/year (1994) and the remaining 188 million ha m/year ground water is still available for exploitation. The report particularly highlights the fact that geological studies indicate that 91 per cent of the State is rocky and the remaining 9 per cent is covered with an alluvial formation, which is favourable for groundwater recharge.

For the purpose of exploiting the underground water, a Survey Board has been created in the State Water Resources department. Besides two Tubewell Boards, several tubewell divisions and sub divisions have also been created to explore the possibility of utilising underground water in the State and the panchayats have been given control of the tubewells. This initiative on the part of the State government for the exploitation of groundwater gets additional boost through the State Government's populist decision to provide free electricity to farmers possessing irrigation pumps up to 5 horse-power.

(The Hindu, 6 May, 1997.)

(G.W.H., Madhya Pradesh, -)

H61). DROP IN GROUNDWATER LEVEL IN CALCUTTA:

Indiscriminate use of groundwater has exposed large areas of Central Calcutta to subsidence - a phenomenon that plagued Jakarta, Bangkok, Yokohama and Sanghai in the recent past.

A recent study, conducted by the Central Ground Water Board (CGWB), found an alarming drop in the groundwater level by 10 metres in Park Street, and Lower Circular Road areas of the city during the past 27 years and the trend continued unchecked.

The CGWB's Eastern Regional Director, Dr. S.P.Sinha Ray, said the Board had already made its observations known to the Calcutta Municipal Corporation, as well as the State Government, and recommended immediate measures to put a stop to the illegal land use and indiscriminate sinking of tubewells.

"The trend is too alarming and this may lead to both massive subsidence and saline water intrusion into fresh water aquifer," Dr. Ray said.

Large-scale withdrawal of groundwater caused a drop in the underground water level by nearly 15 metres in some of the South-East Asian cities, prompting the civic authorities to take immediate steps to save the metropolises and avert further environmental hazards.

Dr. Ray said the CGWB had recommended augmentation of the groundwater supply in the identified areas by adoption of the "artificial recharge method" to combat the danger of subsidence.

(The Hindu - 3 May, 1997.)

(G.W.H., West Bengal, -)

H62). 'POISONED WATER' RINGS ALARM BELLS IN W. BENGAL:

According to experts, an estimated 45 lakh population in at least 61 blocks spread across Malda, Murshidabad, Nadia, North and South 24-Parganas, Burdwan, Hooghly and Howrah, are exposed to arsenic contamination.

The State Government has decided to ask institutions such as the All India Institute of Hygiene and Public Health, Jadavpur University and the Central Ground Water Board to continuously monitor water quality and work out an action plan to combat the menace.

(The Hindu, 25 April, 1997.)

(Water Quality, West Bengal, -)

H63). GUJARAT INDUSTRIES TO PAY MORE FOR WATER:

A steep hike in the water charges has been imposed in Gujarat on the industrial sector, both private and public, to create a corpus fund for drinking water projects in 'no-source' villages.

The decision to increase the charges by about 12 fold was taken at a meeting of the State Cabinet held here today under the chairmanship of the Chief Minister. Mr. Shankarsingh Waghela. The revised water charges will be levied from the current financial year.

The Cabinet decided the major and medium scale industries in the state receiving water from the State irrigation department's notified rivers and other water resources would now have to pay Rs. 6.50 per 1,000 litres of water instead of 85 paise earlier while the small scale industries located in the Gujarat Industrial Development Corporation's industrial estates would be required to pay Rs. 3.25. For other non-agricultural uses of water, the charges had been doubled from 25 paise to 50 paise for 1,000 litres.

(The Hindu, 24 April, 1997.)

(Water Management, Gujarat, -)

H64). NEW DUCKWEED-BASED WASTE WATER TREATMENT SYSTEM:

Sulabh International, a Non-Governmental Organisation, has evolved a "duckweed-based new waste water treatment system" for treating waste water.

The founder of the NGO, Mr. Bindeshwari Pathak, told reporters here today that Sulabh had taken up research-cum-demonstration projects on duckweed based low-cost waste water treatment in rural as well as urban areas with direct economic return from pisciculture and use of duckweed as nutritious feed for poultry and animals.

He claimed that Sulabh had taken up three demonstration-cum-study project in collaboration with the All-India Institute of Hygiene and Public Health, Calcutta.

The urban project located at Delhi and Halisahar in West Bengal was funded by the Central Pollution Control Board. The other two in rural areas were being funded by the Union Ministry of Rural Areas and Employment and the royal Danish Embassy, he said.

The urban study would be helpful in providing a low-cost technology which would not only treat waste water but also give economic return on investment. It would encourage small and medium towns to take up waste water treatment and improve the environment and health status of the people, Mr. Pathak added.

(The Hindu, 22 April, 1997.)

(Waste Water Treatment Plant, India , -)

H65). SSP WILL BE ECO-FRIENDLY, SAYS 'ISRO REPORT':

The Indian Space Research Organisation (ISRO), city-based Space Applications Centre, has indicated that the water of the Sardar Sarovar project will play a vital role in the drought-prone areas of Gujarat and lead to an enhanced ecological set-up. A spokesman of the Sardar Sarovar Narmada Nigam Ltd (SSNNL) told UNI that the ISRO was asked to carry out the satellite mapping of two areas in the advanced Kheda district in central Gujarat. These two areas were 14 km apart and otherwise similar. One area within the command area of the Mahi project was irrigated, while the other was unirrigated.

The satellite data showed that while the 1.29 per cent of unirrigated area was under trees, the irrigated area had 5.61 per cent under trees which meant that irrigated areas had four and a half times tree cover as compared to non-irrigated areas. The ISRO had estimated that the accuracy of the observation was 95 percent. It was also found that because of the greater tree cover and water availability, the population was much larger in the irrigated areas with the presence of more shrubs and ground vegetation.

(The Hindu, 18 April, 1997.)

(Remote Sensing Hydrology/ Drought Prone Area, Gujarat, -)

H66). INDO-CANADIAN PROJECT TO SAVE PUSHKAR FROM SILTATION:

The Pushkar lake in Rajasthan's Ajmer district, will be saved from siltation by shifting desert sands, thanks to a Rs. 4.25 crores Indo-Canadian environmental projection project.

A grant of Rs. 3.01 crores will go to the Rajasthan Government for implementing an integrated watershed management and water storage in the

Pushkar lake area, the second grant of Rs. 8.30 crores will be utilised by the Indian Institute of Technology, Kharagpur, Western Ontario, Canada, for drawing up afforestation and reforestation schemes augmented by soil remineralisation using waste materials.

Mr. S. Srinivas, director, Directorate of Watershed Development and Soil Conservation, (DWDC) of the Rajasthan Government said the Pushkar lake had already silted up to a depth of seven metres. The siltation had resulted in islands of sand and drastically reduced water-flow causing anger among the pilgrims.

Institutional outputs would include instilling a sense of responsibility among farmers and beneficiaries through user's committees for execution of the work.

Mr. Srinivas said women's involvement in decision-making would be enlarged as one-third of the members of the committees would be women.

(The Hindu, 16 April, 1997.)

(Lake Hydrology/ Lake Pollution, Rajasthan, Pushkar lake)

H67). OVER 34,000 HA. AFFORESTED UNDER ARAVALLI PROJECT:

Over 34,500 hectares of land have been afforested under Aravalli Hills Project in Haryana so far. Out of a total project cost of Rs. 112 crores, Rs. 83.71 crores has been spent so far. The cost of the project is being shared by the European Union and the Haryana Government in an 80:20 ratio.

It was one of the most successful projects of its kind in the country under which hilly areas across 293 villages were being covered.

The main objective of the project is to develop village-level institutions that would take over the responsibility of managing the rehabilitated common land.

(The Hindu, 12 April, 97.)

(Forest Hydrology, Haryana, Aravalli Hills Project, -)

H68). AFFORESTATION DRIVE ON TO SAVE DAL LAKE:

Continued agricultural activities in the floating gardens and catchment areas, overgrazing of the catchments, land reclamation, encroachments and mushrooming of construction in and around the lake have also contributed to its degradation.

Situated at an altitude of 1,500 metres above the sea level, East of Srinagar,

the lake has shrunk from 48 sq.km. in 1947 to a mere 15 sq.km. and environmentalists feel that unless immediate steps are taken it would disappear by the next century.

On the surface, the lake may still look beautiful, but the waters have turned into a cesspool of filth and sewage.

The crystal clear waters have turned red due to the appearance of red algae, believed to be the first sign of drying up. Biologically known as euglena rubra, the single-celled organism have turned the water toxic and it is no longer safe even for fish breeding.

The change in colour has been attributed to mechanical de-weeding by some experts, but others believe that lack of circulation and sluggish movement of water in the past few years is responsible for it.

They say over the years, dirt and garbage from surrounding areas have virtually choked the lake.

(The Hindu, April 10, 1997.)

(Environmental Hydrology/Forest Hydrology, Jammu and Kashmir, Dal lake)

H69). CAUVERY AWARD: CENTRE'S SUBMISSION:

The Union of India (UOI) is agreeable "to frame a scheme" under Section 6 A of the Inter-State Water Disputes Act, 1956 for the effective implementation of the "interim award' of the Cauvery Water Disputes' Tribunal dated June 25, 1991, the Attorney-General (AG), Mr. Ashok Desai today submitted before the Supreme Court.

The 'suit' from the State of Tamil Nadu sought the Apex Court's suitable directions to Karnataka to implement the interim order dated June 25, 1991, of the Cauvery Water Disputes' Tribunal - directing Karnataka to release Cauvery water from its reservoirs so as to ensure that 205 tmc ft of water was available in Mettur reservoir in a year from June to May, in a specified manner.

Section 6 A of the 1956 Act deals with power of the UOI "to implement the decision of the Tribunal including the establishment of any "Authority" with necessary power including the right to hold, acquire and dispose of property etc.

A five-judge Bench of the Apex Court in its "advisory opinion" delivered on November 22, 1991, in the "Presidential reference" held that the June 25, 1991 interim

order of the Tribunal constituted a "report and decision" within the meaning of Section 5 (2) of 1956 Act, and therefore, was required to be published by the Central Government in the official gazette under Section 6 of the Act.

The Apex Court in this "advisory opinion" ruled that the Karnataka Cauvery Basin Irrigation (Protection) Ordinance, 1991 - which was subsequently converted into an Act - was unconstitutional because it affected the jurisdiction of the Tribunal appointed under the 1956 Act. (The purpose of the Karnataka Cauvery Basin Irrigation (Protection) Ordinance, 1991 and the subsequent Act was "to nullify the effect of the interim order of the Tribunal").

(The Hindu, April 10, 1997.)

(Interbasin Water Transfer, Tamil Nadu, Cauvery)

H70). LOW COST WATER QUALITY MONITORING:

The RRL has already taken up projects relating to development of irrigation potential and water management in selected semiculture farms of Bilaspur, Raigarh and Sarguja districts, rejuvenation of clogged borewells by employing non-toxic chemical hydrofracturing and ground water resource management through mathematical modelling in Tawa left bank Central Command area in Hoshangabad district. The RRL, they further informed, has done extensive work in the area of water quality monitoring and control of pollutants.

The RRL has established well-equipped laboratories to carry out waste quality monitoring and has also developed many internationally recognised analytical methods and techniques. The RRL scientists have claimed that their institution has all the necessary expertise required for water quality monitoring, including the estimation of pollutant concentrations at trace levels. Against this backdrop, there is a proposal at the RRL level that the water quality monitoring work proposed in the Madhya Pradesh Government's Hydrology project may be assigned to RRL, Bhopal.

For the M.P. Government's hydrology project, a sum of Rs. 761 crores has been earmarked.

The RRL authorities, when contacted said that by assigning the water quality monitoring work of RRL, the Government of M.P. can save over Rs.4 crores, which is about 60 per cent of the cost of setting up the level-I and level-II + laboratories.

The work of water quality monitoring has to be carried out by establishing three levels of laboratories Level-I, Level-II and Level-II+.

The Level-I lab is meant for collection of samples and monitoring on-site parameters such as pH, temperature and conductivity. Whereas the Level-II and Level-II+ labs are meant for monitoring chemical parameters such as concentrations of cations, anions, nutrients, pesticides, aromatic hydrocarbons, phenolic compounds and petroleum products.

(The Hindu, April 10, 1997.)

(Water Quality, Madhya Pradesh, -)

H71). TIE-UP FOR BHOPAL LAKE PROJECT:

The Environmental Planning and Coordination Organisation (EPCO), a Madhya Pradesh Government autonomous organisation, has engaged a Japanese firm in joint venture with an Indian company at a cost of Rs. 9.13 crores for providing consultancy services till March 31, 2000 for the ambitious "Lake Bhopal Conservation and Management Project" which is being executed through a loan agreement between the Government of India and the Overseas Economic Cooperation Fund of Japan (OECF).

The agreement regarding consultancy services for the Bhopal lake project-also known as the Bhoj Wetland project-was signed between EPCO and M/s Kyowa Engineering Consultants Co. Ltd. (KEC) of Japan in joint venture with M/s Consulting Engineering Services (India) Private Limited (CES), New Delhi on July 1, 1996 under the conditions laid down in the loan agreement between GOI and OECF.

(The Hindu, April 7, 1997.)

(Lake Hydrology, Madhya Pradesh, Bhopal lake Project)

H72). CALL FOR REVIVAL OF LOCAL WATER HARVESTING SYSTEM:

The 400 page report is full of examples, supported by pictures, of a variety of systems of water management in the country of the ' kuhlas' in Jammu 'kuls' in Himachal Pradesh' 'guls' in Uttrakhand, 'pats' in Maharashtra, 'zings' in Ladakh, 'zabo' in Nagaland, 'eris' in TamilNadu, 'keres' in Karnataka, 'surangams' in Kerala, 'tanksa', 'kundis', 'bawdis' and 'jhalaras' in Rajasthan and 'virdas' in Gujarat. It

describes how communities in different regions responded to the local geo-climatic situations and threw up systems of water harvesting.

(The Hindu, April 7, 1997.)

(Water Harvesting, India, -)

H73). NRSA POISED TO ENTER GLOBAL MARKET:

IRS data was gaining global acceptance as several ground stations had started to acquire it. At present the share of Indian in the global market was around 10 per cent with just a handful of stations.

Some of those using the data were the United States, Taiwan, Dubai, Germany and Thailand and soon Saudi Arabia, Japan, South Korea, Ecuador, Brazil or Argentina and Australia or South Africa too would benefit from the IRS data. In effect, the entire world would be covered by IRS programmes except China and Russia which were yet to provide permission to open ground stations.

Forestry, wasteland mapping, agricultural crop acreage and yield estimation drought monitoring and assessment flood monitoring and damage assessment, land use and land cover mapping water resources management, groundwater tapping, marine resources survey, urban planning, mineral targeting and environmental impact assessment were some of the fields in which work was progressing well.

(The Hindu, 18, March, 98.)

(Remote Sensing Hyd./ Data Collection, India, -)

H74). MASTER PLAN FOR DRAINAGE SYSTEM VITAL:

There is an urgent need to formulate a master plan for the drainage system network under each sub-region of the National Capital Region townships taking into account the present and future development and settlement pattern for the next 15 to 25 years. At the same time, unauthorised development in low-lying areas exposed to flooding by river or main drain were seriously hampering planning of functional drainage system and this needs to be controlled on a warfooting, according to a study conducted by the Water and Power Consultancy Services Limited, at the behest of the National Capital Region Planning Board (NCRPB). The study was conducted for Rajasthan, Haryana, U.P. and Delhi.

The study points out that a master plan has become all the more important because the previous plans were prepared in the seventies and have become redundant. Since then, a lot of developments have taken place and the existing master plan was not prepared on drainage basins/sub-basin wise, leading to chaos and confusion. As for the Capital, the study feels the Master Plan of Sahibinadi-Najafgarh nullah basin, prepared by the CWC should be implemented without delay. Similarly, the capacity of the Najafgarh supplementary drainage system of 25,000 cusecs is considered adequate for drainage discharge till 2001. At the same time, it is expected that urbanisation limit of Delhi (688 sq. m by 2001) will be restricted keeping in view the NCR plans and policy. However, in case of further expansion an additional drainage capacity will be necessary.

The study indicates there is need to examine critically each major drainage system under basins/sub-basins of NCR at the micro level. This is necessary to assess the deficiencies in planning, designed maintenance and to suggest remedial measures. Also, regular system of monitoring and evaluation of the performance of major surface drains should be enforced for taking suitable action.

For the future, it suggests that in the development of any new township, an integrated storm water drainage system should be planned in advance, keeping in mind the lay of ground, contours and natural drainage channel as well as other drainage network passing through or near the new development.

(The Hindu, 17 March, 1998.)

(Water Plan/ Drainage System, India, -)

Concluding Remarks

Though India is endowed with a vast water resources, the available reports indicate that India may come under the water-stressed zone in near future and could be a water scarcity country by 2050. On the contrary, one of the FAO study indicates that properly managed water resources in India could sustain about 2.6 billion population, i.e., almost three times the present population. The hydrologic events that occur round the year in the country essentially reflect and speak volume about the problems that India is facing in the water -sector. The problems are many and vary over space and time. As such, an attempt has been made herein to highlight some of the major hydrologic events in India to disseminate, propagate and to create an awareness about these problems among hydrologists, managers and planners of water resources so that they can reap benefit out of it to formulate scientifically-sound strategies to solve, mitigate or eliminate these problems for the society at large. Recurrence of flood and drought, soil erosion, receding ground water table, drainage-congestion reservoir sedimentation, pollution of water resources are observed to be some of the major problems of water sector in India. The fury and extent of these hydrologic problems can be lessened and mitigated, if not eliminated totally, by proper planning and management strategies based on appropriate hydrologic principles.

Director : S M SETH

Compiled by

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RAMA DEVI MEHTA

A. K. BHAR

Assisted By: Ms. Nisha Kichlu

Mr. Pradeep Kumar