

FRAMEWORK FOR ACTION (FFA) FOR INDIA WATER VISION - 2025



INDIA WATER PARTNERSHIP

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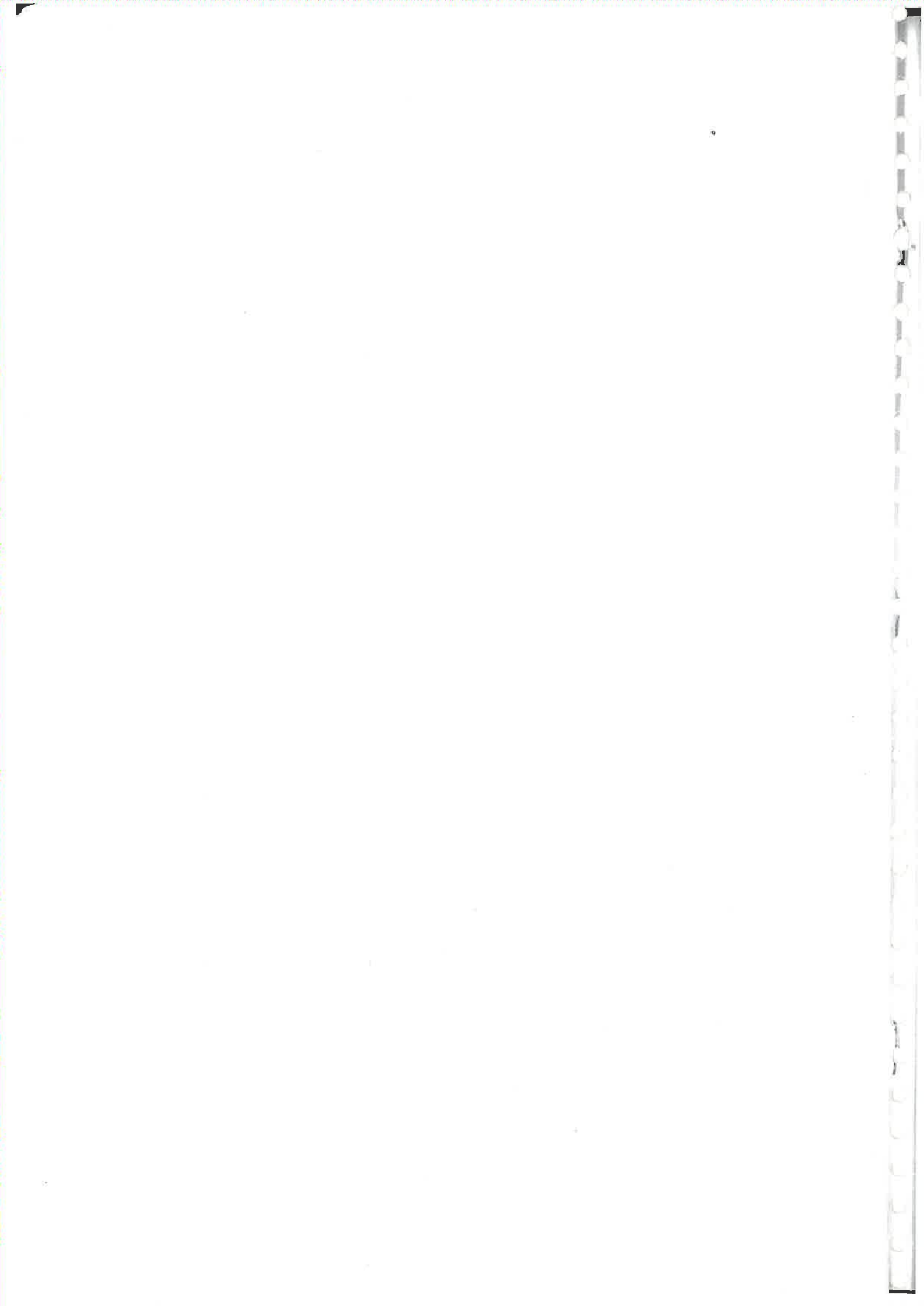
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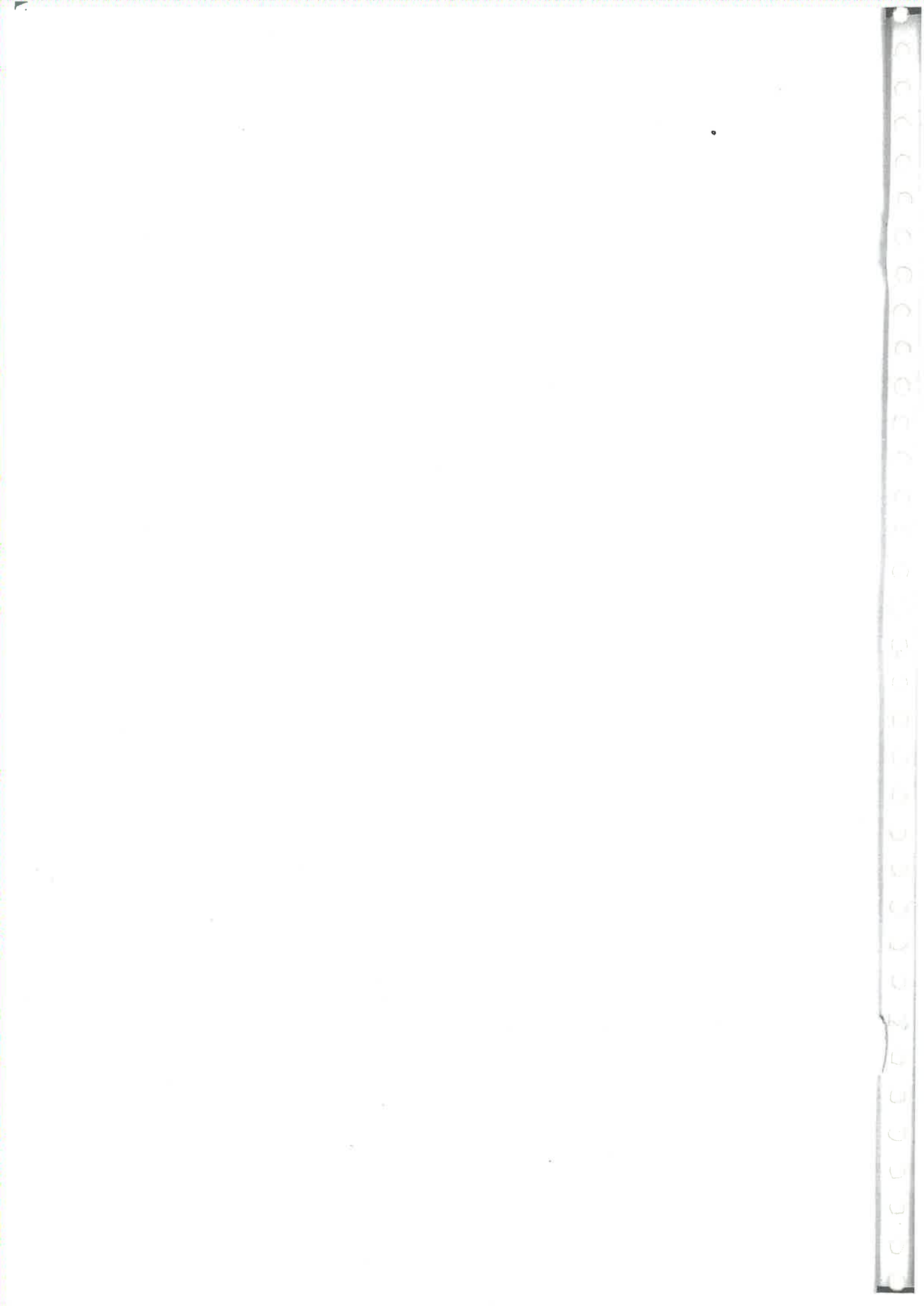
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C O N T E N T S

	<i>Page No.</i>
<i>Foreword</i>	<i>i-ii</i>
Chapter – 1: Framework for Action – Key Elements	1
Chapter – 2: Objectives from Vision	5
Chapter – 3: Strategies	7
Chapter – 4: Framework for Action	9
Chapter – 5: Targets and Milestones	23
<i>Consultation Mapping</i>	<i>27</i>



FOREWORD

Water is a precious and sensitive resource. Although it is renewable, it is also a finite one. Increase in population and rapid industrialisation are putting this resource under stress. Unless this precious resource is properly developed and managed, we may face acute water crisis in the times to come. Keeping this in view the Global Water Partnership (GWP) and its regional Technical Advisory Committees initiated the process of developing a world vision for water and a framework for action to realise the vision. As part of this exercise at the country level, the India Water Partnership (IWP) prepared India Water Vision-2025 in July, 1999 (printed in September, 2000) and Framework for Action (FFA) in February, 2000. Both the Vision and FFA were presented at the 2nd World Water Forum at The Hague in March, 2000.

The Vision was intended to be a dream for a “desirable future” rather than a projection of things to come and was, therefore, not constrained by present realities. In the vision development exercise top priority was assigned to drivers like population growth, its pattern and migration, urbanisation and the impact of mega cities, economic growth, economic reforms, income distribution, structure of agriculture and industrial production, poverty alleviation and meeting basic needs, role of government, administrative decentralisation, user participation, empowerment of communities etc. Estimates of water requirement for various uses, employment generation etc. were based on publications and reports of various government agencies, non-governmental organisations, United Nations, World Bank, WHO, works of social scientists and economists, research papers etc. According to these estimates, the total water requirement for various uses in the year 2025 would be 1027 BCM against the present availability of around 520 BCM (1997).

The process of developing FFA involved identification of objectives from vision elements, evolving strategies to achieve the objectives and translating strategies into implementable actions. The Actions are in the nature of various programmes to be taken up/continued in the fields of water resources development, water supply and sanitation etc. in the short, medium and long term. The Actions also include measures for creating an enabling environment, social changes, capacity building, economic and financial reforms. In the FFA document, the total water requirement for various uses in the year 2025 has been projected as 843 BCM which is based on the estimates of the National Commission for Integrated Water Resources Development Plan (Sept. 1999). This is an improvement over the earlier estimate of 1027 BCM made in the vision document.

During the FFA exercise it was felt that the investment requirements for hydropower development (Rs.7325 Billion), industrial water supply and waste management (Rs.1678 Billion), watershed development (Rs.140 Billion), flood management (Rs.460 Billion) etc. should also be indicated which were not included in the vision document. Accordingly, the total investment requirement now works out to Rs.17100 Billion as against Rs.5000 Billion indicated in the vision document.

These estimates are intended to highlight the enormity of the challenges that the water and related sectors will have to face in the years to come, and not for projecting any investment plans. In fact FFA lays emphasis on certain economic, financial and other reforms that would be necessary to address the crucial problem of mobilising the requisite resources.

The **Framework For Action for India Water Vision :2025** is the outcome of a number of national and zonal consultation meetings with valuable inputs and support from WAPCOS as the host institution. These consultations were represented by various stakeholders including government and private sector representatives, NGOs, academicians, media etc. The institutions represented were Indian Water Works Association and S.N.D.T. university, Mumbai; Water & Land Management Institute, Lucknow; Anna University, Chennai; National Council of Applied Economic Research; Institute of Economic Growth; Agricultural Economics Research Centre; Centre for Policy Research, International Commission on Irrigation & Drainage; Rajiv Gandhi National Drinking Water Mission and Ford Foundation.

The FFA exercise is dynamic in nature since it requires consideration of many complex socio-political, economic and human issues in a scenario of diverse regional perceptions, aspirations and priorities. However, this is a good beginning and I do hope this will serve as an Action Guide for planners and water managers with scope for making necessary mid-course corrections as the FFA is carried forward.

Y. K. Alagh

(Y.K.ALAGH)
Chairman
India Water Partnership

CHAPTER – 1

EXECUTIVE SUMMARY

FRAMEWORK FOR ACTION - KEY ELEMENTS

In order to realise the vision within the next 25 years, a large number of programmes would need to be taken-up in the water and related sectors. For proper and timely implementation of these programmes and to ensure transparency and accountability, participation of the people from various sections of society e.g. stakeholders, institutions, technocrats, NGOs, economists, sociologists, media, women's organisations etc. would be necessary. Accordingly a bottom-up approach has been adopted in preparing Framework For Action from the Vision. Five Zonal consultations were held at Mumbai, Patna, Guwahati, Lucknow and Chennai. A special consultation involving women's organisations was also organised. The outputs of these consultations were discussed in the National Consultation held at Delhi from 16th –17th December, 1999 to finalise the key strategies and Framework For Action .

Integrated development and management of water resources of the country is the key to ensure security for food, livelihood, health and ecology as envisaged in the India Water Vision – 2025. In the water resources sector, special efforts would be required to complete the on-going schemes expeditiously, take-up and complete new schemes specially large storage schemes, optimal utilisation of the potential created, efficient use of water etc. together with environmental safeguards to ensure long term sustainability of the created facilities and services. Community based watershed development programmes with focus on rain water harvesting would need to be taken-up on a large scale with the active support and involvement of the stakeholders and NGOs.

Emphasis would be as much on improved water management as on creating new assets to meet the water requirements for various uses. Water management would be decentralised with participation of the water users at various levels ensuring equity in gender participation.

For proper implementation of various programmes it would be necessary to create an enabling environment through regulatory framework, policy, financial and economic reforms, improvement in infrastructure etc. besides technology upgradation and capacity building measures. Mass awareness and participation of the stakeholders especially that of women in the development process would be necessary.

The key elements in the short term(2005), medium term(2010) and long term(2025) are accordingly set-out below :

1.1 SHORT TERM FRAMEWORK

(A) Integrated Water Resources Development and Management

- i) Completing all ongoing water resources development projects and creating a shelf of project reports for modernisation and rehabilitation of existing projects.
- ii) Dissemination of best IWRM practices.

(B) Water Supply & Sanitation

- i) Preparing detailed plans for taking up micro-watershed development programmes including water harvesting through NGOs and peoples' participation.
- ii) Completing on-going programmes for providing safe drinking water to all.
- iii) Setting up mechanisms for participation of NGOs in providing sanitary services in rural areas.

(C) Enabling Environment

- (i) Review of National Water Policy and it's modification to address all water related issues.
- (ii) Evolving State water policies within the framework of National Water Policy.
- (iii) Setting-up legal instruments to enable setting-up of river basin organisations.
- (iv) Restructuring of water resources and related departments to eliminate multiplicity of functions and to ensure transparency and accountability.
- (v) Review and modification of irrigation Acts and rules there under.
- (vi) Review and modification of policies for accelerating hydropower and navigation development.

(D) Social Change Instruments

- (i) Setting up coordination mechanism between the NGOs and media to take-up advocacy campaign to sensitize political leadership and administration about water related issues.

- (ii) Encouraging public and user participation in the development of water resources projects.
- (iii) Empowerment of Residents' Welfare Associations in urban areas for local water management.

(E) Economic Instruments

- i) Setting-up task forces to evolve mechanism for pricing of water supply and sanitation services and recovery of charges.
- ii) Setting-up task forces to evolve mechanism for rationalising irrigation water charges and ways and means for their recovery.
- iii) Setting-up task force for rationalising power tariffs.

(F) Capacity Building

- i) Setting-up/strengthening dedicated units for centralised data collection, storage & retrieval, decision support systems like GIS, MIS etc., quality control and quality assurance, performance monitoring and evaluation.

(G) Investment & Finance

- i) Setting-up mechanism for increasing private sector participation in hydropower development.

1.2 MEDIUM TERM FRAMEWORK

(A) Water Resources Development

- i) Taking up and completing approved projects
- ii) Completing command area development under existing projects
- iii) Preparing detailed basin wise plans for integrated development of water resources

(B) Water Supply & Sanitation

- i) Taking up and completing water supply schemes to meet the enhanced drinking water requirements.

(C) Enabling Environment

- i) Decentralisation of water management by forming Water Users' Associations, village level water committees etc.

- ii) Enabling environment for transfer of water from surplus to water short regions.
- iii) Setting-up mechanism for cooperation with neighbouring countries and among states within the country for optimum utilisation of water resources.

(D) Technology & Infrastructure

- i) Strengthening R&D institutions in water and related sectors to meet the technology requirements in the areas of water supply & sanitation, irrigation, agriculture, hydropower, flood management, navigation, ground water recharge and watershed development and management.

(E) Social Change Instruments

- i) Setting-up local/village level committees to launch campaigns for mass awareness about various water related issues especially among women and youth.

(F) Capacity Building

- i) Strengthening training facilities for water professionals at various levels through IEC programmes.

(G) Investment & Finance

- i) Strengthening existing financial institutions and liberalisation of credit facilities.
- ii) Setting-up a Development Fund for Urban Infrastructure.
- iii) Facilitating private sector participation for capital investment and sustainable maintenance.

1.3 STRATEGIC LONG TERM FRAMEWORK

- i) Setting-up training facilities for water users and women.
- ii) Privatisation of water supply and sanitation & services, where appropriate and feasible.

CHAPTER – 2

OBJECTIVES FROM VISION

India Water Vision – 2025 has identified certain key vision elements emerging from the country’s concern for the welfare and well being of the people in the overall context of water resources development and management. Various vision elements and the corresponding objectives are set out below :

VISION ELEMENTS	OBJECTIVES
Welfare of the People and Equity	
<ul style="list-style-type: none"> • Safe Drinking water for all available near to their household and at an affordable price • Women and girls do not have to spend too much time on fetching water • Equity in use of drinking water • Availability of adequate food at affordable prices for the poorest • No famine no starvation • Mortality and morbidity due to water related diseases to be brought to the minimum 	<ul style="list-style-type: none"> • Increasing / augmenting water availability • Providing drinking water supply • Preventing pollution of surface and ground water sources • Maximising food production by increasing the area under agriculture & productivity • Transferring water from surplus regions to water short areas.
Decentralisation and People’s Participation	
<ul style="list-style-type: none"> • Increased role of women in decision making on water use • Decentralisation – political, administrative and fiscal 	<ul style="list-style-type: none"> • Gender mainstreaming and participatory water management • Participation of stakeholders

VISION ELEMENTS	OBJECTIVES
Sustainability and Harmony	
<ul style="list-style-type: none"> • Clean rivers, lakes, ponds and other water bodies. No water quality problems • Regional cooperation • No inter-state disputes and tribunals • Ensure minimum flows in rivers and other water bodies • Existing water bodies, specially tanks, in urban areas should be preserved and maintained 	<ul style="list-style-type: none"> • Environmental protection • Basinwise sustainable water resource development • Sustenance of quality and quantity of water resources through awareness programmes/education • User pays – polluter pays
Increasing the role of the Market	
<ul style="list-style-type: none"> • Treat water as an economic good (beyond the basic needs) 	<ul style="list-style-type: none"> • Socio-Economic viability with commensurate return on investments for capital investment and Sustenance of O&M expenses • Private sector participation in capital investments and Sustainable maintainance
Others	
<ul style="list-style-type: none"> • Generation of tourism related water sports activities 	

CHAPTER – 3

STRATEGIES

3.1 The strategies to achieve the objectives of the Vision – 2025 focus on harnessing the country's water resources in an integrated manner to substantially meet the requirements of food and livelihood security, health security and ecological security. There is an urgent need to create an enabling environment and to improve governance of the water sector together with decentralisation of the water management, technology upgradation, capacity building and creating mass awareness about water related issues. Some of the key strategies are listed below:-

- (i) Efficient use of water and minimise losses
- (ii) Augmenting availability of water
- (iii) Reducing and managing water demands including waste water management, and recycling after recovery of pollutants
- (iv) Preventing pollution of water sources
- (v) Maximising food production from available land
- (vi) Maximising net benefits from the available water through harmonious development of various sub-sectors viz. hydropower, industry, navigation etc.
- (vii) Providing protection against floods and improving flood management
- (viii) Protecting environment and ecology
- (ix) Creating an enabling environment and improving governance of water sector
- (x) Capacity building and mass awareness

- (xi) Participation of people especially women in all aspects of water resources development and management

CHAPTER – 4

FRAMEWORK FOR ACTION

India Water Vision 2025 envisages food and livelihood security, health security and ecological security for all as the key objectives of Water Resources Development. Flood and drought management, hydro-power development and navigation are equally important complementary adjuncts of the main objectives and have to be considered as such in order to exploit the full potential of water in realising these objectives.

4.1 FOOD AND LIVELIHOOD SECURITY

4.1.1 Food Security

The present population of the country is about 1 billion and is estimated to reach 1.33 billion by the year 2025. The present annual requirement of food grain at the present consumption level of 550 gm per capita per day is about 200 million tonnes (mt) which is almost equal to the current production. Assuming a moderate rise in consumption level to 625 gm per capita per day, the requirement of food grain in 2025 would be 315 mt. These demand projections do not take into account the implications of free trade in agriculture for following reasons:

- India is a major producer and consumer of most agricultural commodities and if it exports even a small percentage of some of its agricultural products it would augment world market supplies to a great extent thereby exerting downward pressure on prices.
- Indian agriculture is not internationally competitive because of high cost of production on one hand and inadequate technology, marketing and tax structure and high rate of inflation, on the other.
- Financing of food imports from earnings through export of non-food agricultural products is not economically viable due to the dominance of the cereal market by a few big multinational companies.

Since one third of the population is still below the poverty line, food security is an overriding objective. Special attention is required to be given to tribal, drought prone and hilly areas.

Need for Irrigation Expansion

The present productivity of irrigated land, on an average, is about 2.5 tonnes/ha and about 0.7 tonnes/ha for rainfed land. With the advancements in agricultural technology the productivity under the two cultivating conditions are likely to be of the order of 3.4 and 1.25 tonnes/ha respectively in the year 2025. With the present level of irrigation the food grain production in the year 2025 can be raised to only 280 mt leaving a wide gap of 35 mt between demand and supply.

The cultivable area in the country is estimated to be 186 million hectare (mha) of which cultivated area is about 142 mha. Assuming that 70 % of the irrigated and 66% of the rainfed area will be under food grain crops, it is estimated that the 98 mha of land will have to be brought under irrigation to meet the projected food requirement of 315 mt in 2025. Based on the average weighted value of irrigation "delta" of 0.73m for surface water and 0.51 m for ground water, total irrigation water requirement in 2025 will be 611 billion cubic meters (BCM).

4.1.2 Livelihood Security

Expansion of irrigation facilities involves huge investments. These will in turn provide huge direct and indirect employment opportunities in the development of surface and ground water and increased agricultural activities, mostly in rural areas and will benefit a projected rural population of 770 million in 2025. Besides, considerable employment opportunities will be provided on a continuing basis in the operation and maintenance of the irrigation works.

It is estimated that the construction of proposed irrigation works would provide an employment of 42 to 61 million man years by the year 2025 of which 13 to 18 million man years would be for skilled labour and the remaining 0.29 to 0.43 million man year for unskilled labour. Complementary land formation works, construction of water courses, field drains, access roads, land levelling etc. would provide employment of the order of 21 to 31 million man years by the year 2025. Lining of water courses is likely to provide 3.5 to 5.2 million man years of employment. Besides, Operation and Maintenance of irrigation systems would generate 0.24 to 0.33 million man years of employment on a continuing basis. Agricultural operation in additional irrigated areas would provide an annual employment of 5.8 to 8.5 million man years on a continuing basis.

Availability of irrigation water on such a large scale would offer opportunities for fresh water aquaculture in conjunction with irrigated agriculture. It is estimated that direct annual employment from pond operations would be 158 man days/ha. Since women perform a large number of operations in aquaculture process considerable employment opportunities would be created for women.

Impact on Poverty

Studies carried out by various researchers indicate that there is an inverse relationship between availability of irrigation and incidence of poverty. This relationship works through lowering of food prices, as a result of increased production, which has the effect of increasing real wages. Expansion of irrigation on such a massive scale is, therefore, likely to contribute significantly to reduction in incidence of poverty.

Based on the studies carried out for some of the irrigated areas, it is expected that though the farm income would increase in absolute terms, the rich farmers would become richer and poor farmers would become less poor. The relative inequities in standards of living of the two categories could, however, be addressed to some extent, through differential policies in favour of small farmers.

4.2 HEALTH SECURITY

About 200 million people in India do not have access to safe drinking water. Most of the water sources are polluted with untreated or partially treated wastes from industry, domestic sewage and fertilisers and pesticides run-off from agricultural fields.

As a result about 21 percent of all communicable diseases in India are water borne. Nearly 73 million man days are lost every year due to people suffering from these diseases. Diarrhoea is responsible for 25-30 percent of deaths in children below five years of age. Epidemics of infections, jaundice, typhoid and food poisoning are also common occurrence. In addition there are water-related vector-borne diseases, of which Malaria is the most prominent which accounts for more than 2 million cases and more than 1000 deaths every year. Besides, chemical pollution of water sources causes serious health problems. The most serious among these are arsenic and fluoride contamination of ground water in parts of West Bengal and Gujarat respectively.

In order to ensure health security it is absolutely necessary to provide safe and adequate water supply and a minimum level of sanitation to cover the entire population of the country. Discharge of municipal and industrial effluents into the water bodies also needs to be controlled and regulated by strict enforcement of relevant laws. Based on the norms of 220 lpcd for class I cities, 165 lpcd for other towns/cities and 70 lpcd for rural areas, 62 BCM of water would be required to cover the country's population in 2025.

4.3 ECOLOGICAL SECURITY

With its geographic, climatic and biological diversity, India has a unique environmental heritage. The land mass and water bodies of the country sustain a rich variety of plants and animals. The bio-diversity in India constitutes about 8 percent of the global bio-diversity. It is one of the twelve mega bio-diversity centres of the world and ranks tenth in the world in terms of plant varieties and mammalian species and eleventh in terms of endemic species of higher vertebrates.

Out of the total geographical area of 329 million hectares, about 175 million hectares are considered degraded. About 141 million hectares are subject to water and wind erosion. Another 34 million hectares are degraded through special problems such as water logging and salinity. In India forest wealth has dwindled, over the last five decades, due to diversion of 4.5 million hectares of forests for non-forestry purposes. The present rate of diversion is about 16,000 hectares per year. This has had an adverse effect on flora and fauna. Lean season flows in many rivers have dwindled due to large scale diversion of waters for irrigation. In spite of strict laws and regulations, industrial and municipal

effluents are being discharged into rivers, lakes and other water bodies. As a result water quality in most of the rivers is deteriorating alarmingly.

With increased water withdrawals, large scale recycling of water would become inevitable. Estimates indicate that the natural recharge to ground water at 342 BCM would be augmented by another 232 BCM as return flows from agricultural and domestic uses. Similarly, 73 BCM of recycled waters would get added to surface bodies. The natural outflows would reduce annually by 564 BCM. A large programme of monitoring water quality of both aquifers and streams would have to be put in place, to provide early warnings for taking corrective action. .

It is estimated that 10 BCM of water would be required in 2025 for maintaining minimum flows in rivers for ecological purposes. Afforestation would be supported by available soil moisture and therefore, no separate provision is envisaged for this purpose.

4.4 FLOOD PROTECTION / MANAGEMENT

India experiences floods every year in some part of the country or the other. An area of 40 mha is prone to flood of which only about 14 mha has been provided with some degree of protection. On an average the total annual losses on account of damage to crops, public utilities, houses etc. are of the order of Rs. 10 billion. Loss of crops is of the order of Rs. 4.5 billion. Besides 250 million man days are lost every year. Stagnation of flood waters aggravate unhygienic conditions causing spread of water borne diseases. The floods, therefore, seriously threaten food, livelihood and health security. There is, therefore, an urgent need to protect both rural and urban areas from floods through structural and non-structural measures.

4.5 HYDROPOWER

Water requirements for hydropower are by and large non-consumptive. India has an economically exploitable hydropower potential of over 84,000 MW at 60% load factor corresponding to 1,48,700 MW of installed capacity. In addition there is a potential of 94,000 MW through pumped storage schemes and 1000 MW from small, mini and micro schemes. So far only about 15% of the hydro power potential has been harnessed. There is, therefore, an urgent need to substantially accelerate the pace of hydropower development. The main advantages of hydropower are that it is non-polluting, has low generation cost and is suitable for peaking purposes. Since most of the hydropower potential is in the upper reaches of the Himalayan rivers, cooperation with the neighbouring countries would be necessary.

4.6 NAVIGATION

The water requirements for navigation are non-consumptive but certain minimum depths of water are required to be maintained in rivers and streams. So far navigation has not received due importance not only in water resources planning and development but also in the National Water Policy. At present the total cargo moved by Inland Water

Transport (IWT) is only 16 million tonnes which is equivalent to just over 1 billion tonne-km out of the total inland cargo potential of about 900 billion tonne-km. It is estimated that a mere shift of 20 billion tonne-km to IWT would result in annual savings of Rs.500 crore in fuel costs. Saving in transportation costs would be Rs.9 billion. Special attention must, therefore, be paid to IWT in water resources development planning. A requirement of 10 BCM for navigation is envisaged.

4.7 OTHER WATER USES

The other uses of water are in industry and thermal power generation. The water requirements for these uses are as follows:

4.7.1 Water for Industry

The industries requiring considerable quantities of water can be broadly categorised as small scale industries, chemicals and petrochemicals, steel, paper, fertilisers, textiles, food processing, coal, building, non-ferrous metals, sugar, cement and automobile. The total requirement of water for industry in 2025 has been assessed as 67 BCM.

4.7.2 Water for Energy

The projected demand of power in the year 2025 is 5 million MW, bulk of which would have to come from thermal power plants and the peaking power from hydro schemes and pumped storage schemes. The total consumptive water requirement for power plants in 2025 is estimated as 33 BCM.

4.7.3 Provision for evaporation losses

The total live storage capacity of reservoirs in 2025 is expected to be of the order 340 BCM. Based on the average annual loss of 15% due to evaporation, a provision of 50 BCM would be required in planning water resources projects.

4.7.4 The overall requirement of water for various uses would be 843 BCM in the year 2025.

In order to meet these requirements water availability would need to be increased from the present 600 BCM to 843 BCM in 2025.

Even if the pace of development of water resources is increased considerably within the budgetary and physical limitations, many programmes in the water sector would be required to be continued well beyond the year 2025 to meet the future requirements.

4.8 INVESTMENT NEEDS

For making detailed estimates of investment needs in water sector, following aspects would need to be considered:

- i) Complementary and competing nature of demands for water for different sectors.
- ii) In the areas of ground water development and watershed development, fairly large investments have been made by farmers and communities themselves. Thus, while the investments in these areas may be large, funding requirements may be smaller.
- iii) Investment in drainage would be made an integral part of investment for irrigation development.
- iv) Inter-basin transfer of waters as may be feasible with-in the next 25 years i.e. upto 2025, would be considered.
- v) The cost of supplying drinking water from spot sources and by piped supply would be considered separately. As per the current trend, the ratio between spot sources and piped supply is likely to be 60:40 by the year 2025 but it would be desirable to consider a ratio of 20:80.
- vi) Pragmatic and reliable estimates of water losses that could be eliminated and reduction in water demand through various measures.

The total investment requirement for irrigation, domestic and industrial water supply, sanitation, hydropower, watershed development, flood management etc. is estimated as Rs.17100 Billion.

4.9 SOURCES OF FUNDING

At present, government is the dominant source of investment in water sector. The share of private sector and communities is relatively smaller. However, in future more balanced sources of investment would be necessary with emphasis on increased private sector participation. To attract private sector to invest in certain areas like water supply, policies regarding pricing, cost recovery etc. would require changes besides a regime of fiscal incentives and disincentives. This would require political will for appropriate legal and institutional changes, setting-up regulatory mechanism and enforcement of rules and regulations.

Multilateral and bilateral fundings will continue to play a key role in water sector though the magnitude of funding is likely to decline in future.

For utilisation of funds under Rural Infrastructure Development Fund (RIDF), provided by National Bank for Agriculture and Rural Development (NABARD), the existing mechanism in the States would need to be strengthened. Though there is limited scope for raising funds from the capital market, this source would need to be tapped.

While the government alone can make huge investments for development of new dams and other structures, their maintenance and collection of water charges could be handed over to private sector.

4.10 PROMOTING CHANGE

Actions must be taken by every body and at all levels, with households and the governments at the centre and in the states playing key roles. People must adopt water-friendly practices and the governments must evolve and implement water-related policies. These policies must be in accordance with philosophy of integrated water resources development and management (IWRDM).

With the country's water resources being limited and the demand for various water uses growing, there is need to change conventional attitudes and beliefs to adopt a modern and holistic approach to water commensurate with cultural values. A change in political will to a new approach to water would be necessary so that necessary new initiatives and actions may be taken.

In order to prevent resistance to change, enlightenment of the leadership and participation of all stakeholders would be necessary. With active participation of all stakeholders, NGOs, government agencies, civil society, women's organisations, media etc, a "water movement" with focus on environmental safeguards would be necessary.

4.11 EFFECTIVE WATER SECTOR GOVERNANCE

In order to meet the challenges of meeting water requirements for various uses in the year 2025 with adequate environmental safeguards, the governance of the water sector at all levels would need to be improved. Good governance would require transparency, accountability, participatory mechanisms appropriate to local realities, needs and aspirations and respect for law, rules and regulations. In order to improve governance of the water sector, administrative, economic, financial and policy reforms would be necessary together with appropriate monitoring of performance.

4.12 MANAGEMENT TRANSFER TO WATER USERS

In irrigation projects the responsibility of water distribution and its over all management needs to be transferred to the Water Users' Associations (WUAs). Maintenance of certain components of the project should also be transferred to them.

4.13 MAINSTREAMING GENDER IN WATER SECTOR

In India women form bulk of the labour force in agriculture and fisheries besides being exclusively responsible for managing water at the household level. They may therefore be more responsive to concerns regarding long term safe and sustainable water use. They can play a significant role in economical use of water and preventing its pollution. The existing networks of women's associations, women's educational institutions,

women NGOs etc. need to be expanded to reach out to women in all parts of the country to bring them in the mainstream of water management at appropriate levels.

4.14 CAPACITY BUILDING

Training programmes for water resources engineers and managers need to be taken up to upgrade their skills based on state-of-the-art know how in all aspects of planning, design, construction, O&M and management of water resources projects. Special efforts would be required for training of women.

4.15 RESEARCH & DEVELOPMENT

In India, research and development efforts need to focus on low cost and clean technologies to increase efficiency in water and related sectors viz. increasing productivity of agricultural lands with the available water, fresh water eco-systems, sanitation, recycling and reuse of water from agriculture and industry etc.

4.16 THE MAIN THRUST AREAS

4.16.1 Integrated Water Resources Development & Management (IWRDM)

- i) Completion of all on-going projects.
- ii) Modernisation and/or rehabilitation of existing projects.
- iii) Taking up large, medium and small storage developments to meet increasing demands.
- iv) Development of navigation as part of integrated development of water resources of a basin.
- v) Finalising plans for water transfers to deficit areas, and taking up a few schemes for implementation.
- vi) Improving water management in existing projects.
- vii) Ensuring equity in gender participation in water management.

4.16.2 Hydropower

Development of Hydropower for peaking purposes

4.16.3 Agriculture

- i) Expanding irrigated area and gross cropped area, without expanding net sown area.

- ii) Development and promotion of high yielding varieties.
- iii) Consolidation of land holdings.
- iv) Efficient water use in agriculture.
- v) Protection of agricultural lands from floods and sea water ingress.
- vi) Prevention of waterlogging and salinity in agricultural lands.
- vii) Reclamation of waterlogged and saline lands for agriculture.

4.16.4 Water Supply & Sanitation

- i) Provision and Management of drinking water for all.
- ii) Minimising water loss and unaccounted for water.
- iii) Special efforts for providing increased and reliable water supply possibly through large storages for the fast growing urban population.
- iv) Provision of latrines in rural areas.
- v) Treatment of sewage for reuse and check on pollution of water bodies.

4.16.5 Forest & Environment

- i) Afforestation, conservation of forests and water resources.
- ii) Resettlement and rehabilitation of project affected people.
- iii) Protection of water bodies from pollution and maintaining minimum flows in rivers.

4.16.6 Other Sectors

- i) Consolidation of land holdings and land reforms.
- ii) Simplification of procedures for land acquisition.
- iii) Flood relief measures.
- iv) Innovative designs for reliability of drinking water supply during natural disasters.
- v) Encouraging reuse and recycling of industrial water through incentives and disincentives.

4.16.7 Mobilisation of People

- i) Empowerment of people, especially the women, to ensure their whole hearted participation in planning, development and various aspects of water management, protection and preservation of environment and ecology.
- ii) Promoting watershed development programmes with particular focus on rain water harvesting.
- iii) Encouraging and facilitating community participation for increasing ground water recharge and augmenting lean season flows in rivers and streams.

4.16.8 Institutional Development

- i) Developing and supporting NGOs, Village Level Water Committees, Water Users' Associations, People's Watch Groups, People's Task Forces etc. in water management and equity in gender participation.
- ii) Establishing linkages between these institutions and governmental agencies.
- iii) Restructuring of water resources and related departments to eliminate multiplicity of functions and ensure transparency and accountability.
- iv) Setting up dedicated Water Management Units with data banks, decision support systems like GIS, MIS and monitoring and evaluation cells in the water resources and related departments at the centre and in the states.

4.16.9 Involvement of Media

- i) Involving media in creating mass awareness about various water related issues and promoting people's participation in water sector.
- ii) Sensitising political leadership and administration at the centre and in the states about impending water crisis and the need for bold policy initiatives and determined time bound ameliorative action.

4.17 RESOURCE MOBILISATION

Over the years government funding in water resources sector has been declining. In order to achieve various targets in a time bound manner it would be necessary to substantially increase the budgetary allocations besides raising resources from financial institutions and donor agencies.

4.18 FRAMEWORK FOR ACTION

Following actions are required to be under taken in short term (ST) upto 2005, medium term (MT) upto 2010 and long term (LT) by 2025.

4.18.1 Water Resources Development

- | | | |
|------|---|-------|
| i) | Completing all ongoing water resources development projects including hydropower projects. | ST |
| ii) | Preparing plans for modernisation and rehabilitation and for existing projects. | ST/MT |
| iii) | Taking up and completing approved projects. | MT |
| iv) | Completing command area development programmes under existing projects. | MT |
| v) | Preparing detailed basinwise plans for integrated water resources development taking into consideration water requirements for various uses viz., urban/rural water supply, irrigation, industry, hydropower, navigation etc. together with environmental safeguards. | MT |
| vi) | Preparing detailed plans for taking up micro watershed development programmes with focus on water harvesting and soil conservation through NGOs and people's participation. | ST |
| vii) | Dissemination of best IWRM practices | ST |

WATER SUPPLY AND SANITATION

- | | | |
|------|--|----|
| i) | Completing the ongoing programmes for providing safe drinking water to all. | ST |
| ii) | Taking up and completing water supply schemes to meet the enhanced drinking and industrial water requirements. | MT |
| iii) | Setting up Mechanism for participation of private sector and NGOs in providing sanitary services in rural areas. | ST |

ENABLING ENVIRONMENT

- | | | |
|----|--|----|
| i) | Review of National Water Policy and to carry out necessary modification to address all water related issues. | ST |
|----|--|----|

- | | | |
|-------|---|----|
| ii) | Evolving state water policies within the framework of National Water Policy. | ST |
| iii) | Creating necessary legal instruments to enable setting-up of river basin organisations. | ST |
| iv) | Creating necessary legal instruments to facilitate transfer of water from surplus regions/basins to deficit regions basins. | MT |
| v) | Establishing cooperation with neighbouring countries and among states within the country for optimum utilisation of water resources. | LT |
| vi) | Review of irrigation acts and carrying out modifications therein and framing rules there under. | ST |
| vii) | Creating National Water Code to bring about uniformity in dealing with environmental concerns, Rehabilitation & Resettlement (R&R) of Project Affected People (PAP), participatory management of water resources, pricing of water, water rights etc. | MT |
| viii) | Creating necessary legal instruments for fast redressal of R&R related issues of oustees and smooth R&R process. | MT |
| ix) | Installing a national water quality monitoring programme for surface and ground water, and publishing this information. | ST |
| x) | Decentralising water management by forming water users' associations, village level water committees etc. | MT |
| xi) | Strengthening the existing mechanism for enforcing various water pollution control measures. | ST |
| xii) | Review of policies and carrying out necessary modifications for accelerating hydropower and navigation development. | ST |

TECHNOLOGY AND INFRASTRUCTURE

- | | | |
|-------|---|----|
| xiii) | Strengthening R&D institutions in water and related sectors to meet the technology requirements in the areas of water supply & sanitation, irrigation, agriculture, hydropower, flood management, navigation, ground water recharge and watershed development and management. | MT |
|-------|---|----|

SOCIAL CHANGE INSTRUMENTS

- xiv) Strengthening existing mechanisms to support NGOs in water and related sectors. ST
- xv) Setting up local/village level committees to launch campaigns for mass awareness about various water related issues especially among women and youth. MT
- xvi) Setting up mechanism for user/public participation with equity in gender participation in planning, design, construction and O&M of the projects. ST
- xvii) Empowering Residents' Welfare Associations for local water management. ST
- xviii) Setting up mechanism for co-ordination with media and NGOs to take up advocacy campaign to sensitise political leadership and administration about water related issues. ST

ECONOMIC INSTRUMENTS

- xix) Setting up Task forces to evolve mechanism for pricing of water supply and sanitation services and recovery of charges. ST
- xx) Setting up Task forces to evolve mechanism for rationalising irrigation water charges and ways and means for their recovery. ST
- xxi) Empowering WUAs to recover irrigation water charges. ST
- xxii) Setting up Task forces for rationalising power tariffs. ST

CAPACITY BUILDING

- xxiii) Strengthening/setting up dedicated units for data collection, storage & retrieval, quality control and quality assurance, performance monitoring and evaluation. ST
- xxiv) Setting up training facilities for water users and women by NGOs, WUAs and village committees. LT
- xxv) Creating/strengthening training facilities for water professionals at various levels through IEC programmes. MT

INVESTMENT & FINANCE

- | | | |
|---------|---|----|
| xxvi) | Privatisation of Water supply and sanitation where appropriate and feasible. | LT |
| xxvii) | Strengthening existing financial institutions and liberalising credit facilities. | MT |
| xxviii) | Creating/strengthening Development Fund for Urban Infrastructure. | MT |
| xxix) | Improving / strengthening existing mechanism for increasing private sector participation in hydropower development. | ST |

CHAPTER – 5

TARGETS AND MILESTONES

Sl. No.	Action	Milestone (%)	Target
IWRDM			
i)	Complete ongoing schemes	100	2005
ii)	Complete modernisation/rehabilitation of existing projects	50	2005
iii)	Approved projects would be taken-up and completed	100	2010
iv)	Complete command area development schemes under existing projects	100	2010
v)	Carryout investigation/data collection for basinwise plans (including hydro power)	40	2008
		100	2012
vi)	Prepare feasibility report for additional storage based water development	40	2010
		100	2015
vii)	Prepare feasibility & detailed project reports for transfer of water from surplus to deficit areas	60	2010
viii)	Take-up implementation of a few critical water transfers	10	2010
ix)	Preparation of micro watershed development plans	100	2005
x)	Mechanism for public/user participation in water resource planning, design, construction and O&M	100	2005
WATER SUPPLY AND SANITATION			
i)	Develop drinking water sources @ 40 lpcd Enhanced rate @70 lpcd-rural @165 lpcd -urban	100	2005
		100	2015

Sl. No.	Action	Milestone (%)	Target
ii)	Provide latrines in rural areas	100	2020
iii)	Preparing master plan for growing water supply demands of large cities	100	2005
iv)	Taking-up critical storage based multi-purpose projects for improved reliable water supply to large cities	20	2010
HYDRO POWER			
i)	Complete ongoing hydro power schemes	100	2010
ii)	Preparing a phased programme for achieving a balance between hydro and thermal power	100	2005
iii)	Achieving a hydro thermal mix of desirable level	100	2025
ENABLING ENVIRONMENT			
i)	Adopt National Water Policy	100	2002
ii)	Adopt State Water Policy	100	2005
iii)	Set-up River basin organisations with legal backing	100	2005
iv)	Preparation and adoption of National Water Code & passing enabling acts for smoother & responsive R&R	100	2005
v)	Setting-up of a National Water Quality Monitoring Programme	100	2005
vi)	Strengthen Irrigation Acts	100	2003
vii)	Frame rules under Irrigation Acts	100	2005
viii)	Restructure Water Resources organisaions	100	2005

Sl. No.	Action	Milestone (%)	Target
ix)	Set-up dedicated Water Management Units	100	2008
x)	Provide decision support systems	100	2010
xi)	Set-up WUAs	50	2005
		100	2008
xii)	Adopt policies on hydropower & navigation	100	2010
xiii)	Cooperation with neighbouring countries and among the states	100	2025
TECHNOLOGY AND INFRASTRUCTURE			
i)	Strengthen R&D institutions in water and related sectors	100	2010
SOCIAL CHANGE INSTRUMENTS			
i)	Strengthen existing mechanisms to support NGOs in water and related sectors	100	2005
ii)	Set-up local/village level committees to launch campaigns for mass awareness about water	100	2010
iii)	Empower Residents' Welfare Associations for local water management	100	2005
iv)	Set-up coordination mechanism to sensitize political leadership and administration about water related issues	100	2005

ECONOMIC INSTRUMENTS			
i)	Set-up task force to evolve mechanism for pricing of water supply and sanitation services and recovery of charges	100	2005
ii)	Set-up task forces to evolve mechanism for rationalising irrigation water charges and ways and means for their recovery	100	2005
iii)	Empower WUAs to recover irrigation water charges	100	2005
iv)	Set-up task forces for rationalising power tariffs	100	2005
CAPACITY BUILDING			
i)	Set-up/strengthen units for data collection, storage & retrieval, quality control and quality assurance, performance monitoring and evaluation	100	2005
ii)	Set-up training facilities for water users and women	100	2020
iii)	Set-up / strengthen training facilities for IEC programmes in water sector	100	2020
INVESTMENT & FINANCE			
i)	Privatise water supply and sanitation	100	2020
ii)	Strengthen existing financial institutions and liberalise credit facilities	100	2010
iii)	Set-up Development Fund for Urban Infrastructure	100	2010

CONSULTATION MAPPING

Consultation process for preparation of Framework For Action for India Water Vision : 2025 consisted of two national and five zonal consultations held in September – December, 1999. The details of these consultations are given below :

1. First National Consultation

The first national consultation was held in New Delhi on September 20-21, 1999. This consultation was meant to set out the approach and methodology to be followed in identifying the strategies and action plan in the proposed zonal consultations to be held at Mumbai, Patna, Guwahati, Lucknow and Chennai. Prof. S.R.Hashim, Member, Planning Commission, Govt. of India was the Chief Guest. The consultation was attended by coordinators and resource persons of the proposed zonal consultations coming from various parts of the country, apart from a wide range of participants comprising representatives from govt., NGOs, international organisations, women's group, academic, training and research institutions. The consultation was attended by 64 participants.

2. West Zone Consultation

The West Zone consultation was held on November 4-5, 1999 at Mumbai. The consultation was attended by 42 participants from various disciplines like engineering, social science, finance, economics etc. The participants represented govt. and private institutions, NGOs, women's group etc.



Sh. V.N. Pendse, Director General, WALMI, Aurangabad addressing the participants during West Zone consultation held at Mumbai.

The consultation focused on the following issues :

- Water Supply and Utilities, Health and Sanitation
- Industry, Recycling and Reuse of Water, Water Pollution
- Investment in Water (Financial Flows)
- Bio-diversity, Environment and Ecology



Deliberations during the West Zone Consultation held at Mumbai

3. East Zone Consultation

Consultation for the East zone was held on November 11-12, 1999 at Patna. The consultation was attended by 49 participants from a wide spectrum of disciplines like engineering, sociology, social science, finance, economics etc. The participants represented govt. and private institutions, NGOs, women's group, media etc. Following issues were discussed in the consultation :

- Flood Management
- Navigation
- Groundwater Development and Management
- Problems of Drought Prone and Tribal Areas



Sh. B.S. Ahuja, Commissioner (PP), Ministry of Water Resources making a presentation in East Zone Consultation held at Patna

4. North East Zone Consultation

The North East Zone consultation was held at Guwahati on November 15-16, 1999. The consultation was attended by 44 participants from various disciplines like engineering, social science, finance, economics etc. Shri Biraj Kumar Sarma, Hon'ble Minister, Govt. of Assam was the Chief Guest. The participants represented govt. and private institutions, NGOs, women's group etc. The consultation focused on the following issues :

- Hydropower and Energy requirement of Water
- Agriculture and Water
- Fresh Water Supply and Utilities
- Flood Protection/ Management





Deliberations during the North East Consultation held at Guwahati

5. North Zone Consultation

Consultation for the North zone was held on November 26-27, 1999 at Lucknow. Shri Om Prakash Singh, Hon'ble Minister for Irrigation, Govt. of UP was the Chief Guest. The consultation was attended by 49 participants from a wide spectrum of disciplines like engineering, sociology, social science, economics etc. The participants represented govt. and private institutions, NGOs, women's group, media etc. Following issues were discussed in the consultation :

- Hydro Power Development
- Flood Management
- Capacity Building



Group Discussions

6. South Zone Consultation

Consultation for the South zone was held on December 13-14, 1999 at Chennai. The consultation was attended by 67 participants from a wide spectrum of disciplines like engineering, sociology, social science, economics etc. The participants represented govt. and private institutions, NGOs, women's group, media etc. Following issues were discussed in the consultation :

- Agriculture and Water
- Groundwater Development and Management
- Governance and Institutions



Deliberations during the South Zone Consultation held at Chennai

7. Second National Consultation

The second national consultation was held in New Delhi on December 16-17, 1999 to consolidate the efforts thus far made in various consultations and to finalise the framework for action. The recommendations of various zonal consultations were presented and discussed. Dr. C.P.Thakur, Hon'ble Minister of Water Resources, Govt. of India was the Chief Guest. Shri B.V.Patil, Hon'ble Minister of State for Finance, Govt. of India also graced the occasion.



Sh.. B.V. Patil, Hon'ble Minister of State for Finance, Govt. of India addressing the participants

The consultation was attended by 72 participants comprising representatives from govt. and private sector, NGOs, international organisations, women's group, academic, training and research institutions, media etc.

Representatives from Ministry of Water Resources, Central Water Commission, Planning Commission, Central Ground Water Board, DFID, National Council of Applied

Economic Research, Centre for Science & Environment, Institution of Economic Growth, Centre for Policy Research, International Commission on Irrigation and Drainage, Agriculture Economic Research Centre, Delhi University etc. participated in the consultation. Dr. (Mrs.) Neela Dabir, Principal, SWGH College, Mumbai, Ms. Malliha Hussain, Pakistan and Ms. Kusum, Sri Lanka also participated.



Galaxy of Participants

8. Meeting with NGOs

A separate meeting was held on 22nd December, 1999 in New Delhi for discussions with NGOs for their views on involvement of community and user groups in the proposed framework for action.

9. Consultation on Investment Needs and Financing Issues

Inadequate availability of funds for water sector is a key issue which came up for discussion in various Zonal and National Consultations. Given the criticality of the issue, a consultation meeting on “Investment Needs and Financing issues in Water Sector” was organised at Delhi on 28th January, 2000 under the auspices of SASTAC and Resources & Environment Group (REG) of the Global Water Partnership. The meeting was attended by experts from various financial institutions and research organisations, industry, banks, academic and professional institutes, government and private sector organisations, NGOs etc.

