Chapter–1:

Introduction

- *"Those who harness water, harness rewards for themselves; and those who fail cannot endure."*
(Translation of a poem from Sangam Age, 2000-2500 years old)

- *"We must spare no effort to free all of humanity, and above all our children and grandchildren, from the threat of living on a planet irredeemably spoilt by human activities, and whose resources would no longer be sufficient for their needs."*
(United Nations Millennium Declaration)

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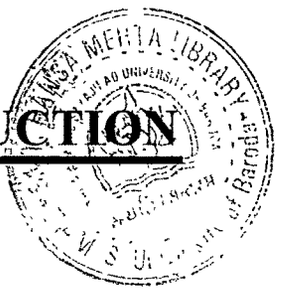

INTRODUCTION

1 PROBLEM OF THE STUDY

Nature has bestowed India with huge (but not unlimited) amount of water resources; yet the country continues to be plagued by the drought-flood-drought syndrome. The genesis of the problem lies in factors of limited availability of water, and the extreme unevenness of available water over space and time due to natural factors[1] such as India's physical features, geological structure, climatic conditions, etc., collectively constituting the 'fixed parameters[2]' of the problem. The problem is further complicated by the unabated growth of population[3], causing supply and demand mismatch. Unfortunately, the population growth is not likely to change the direction of progression in a foreseeable and meaningful time frame, though its rate of growth may slow down. Hence, with its practically irreversible impact on the water resource problem, the factor of population growth may be termed as the 'uncontrollable parameter' of the water resource problem domain.

Besides, there are other parameters that impact the water resource problem perceptibly, but are more amenable; and hence can be termed as 'controllable parameters'. Controllable parameters essentially relate to (i) the diverse characteristics (in terms of water needs) of Indian population because of regional, social, economic and sectoral segmentations; (ii) the economic conditions of the states affecting water resource development at macro level, and the resource allocations and usage pattern at micro levels; (iii) the level of technological developments in various sectors that affect or are affected by water; and (iv) adequacies of structural reforms at constitutional, institutional, and organizational levels, in dealing with complex and diverse issues.

All three types of parameters taken together constitute the dynamic water resource problem domain; but only controllable parameters can be manoeuvred to contain the extent of the problem. However, a deeper probe leads to greater perplexities of the problem, and also points to the polarisation of views on the reasons for its situation and ways of surmounting it, as discussed hereunder:

- There are two schools of thoughts on the water resource development issue. On one hand, there are people who consider inadequacy of water-supply development as the cause of the problem, and hence advocate enhanced exploitation of rivers by building more and bigger dams. On the other hand, there are people who consider damming of rivers - especially by large dams - as the root cause of the problem, and they argue for annulment of river valley schemes for a variety of reasons including environment and ecology. Actually, the water supplies by harnessing of rivers can only be a fraction of the total utilizable water of India and the balance is mostly required to be met from the groundwater. However, there is an intricate link between rivers and groundwater and hence the debate on water is largely centred about river valley projects with heightened attention[4]. The people adhering to either of school of thoughts are polarized in their viewpoints, and often emotionally charged[5] too. The perplexity of confining the issue of water resource development between two pillars of project supporters and opponents, and the resulting perpetual dilemma of 'building-or-not-building dams[6]', has become the central conflict in India's paradigm of water resource development, calling for an appropriate framework for resolution.

- The water resource projects, with their intrinsic and manmade inadequacies for meeting all conceivable demands of populace, is also a continuous source of regional and sectoral conflicts. Cascading downwards, these conflicts create intense disharmony amongst different beneficiaries of a project; and cascading upward, they cause dissonance among beneficiaries of different projects on the same river. The river sharing conflicts have strong political shades, and are being increasingly encountered because of such reasons as: (a) constitutional interpretation of the 'river' as a "state subject matter"; (b) delimiting of the optimisation of river potentials within the boundaries of one state or basin states; and (c) win-lose perspective with which disputes are created, and approached for resolutions. Because of the now gaining notion of networking the rivers and the forlorn hope of transporting river-water from one corner to another corner of the nation, the debate on the sharing of river waters and the pros and cons of river-interlinking projects has become much more intense and widespread. While the unending debate continues, the consequences of indecisiveness is deepening, compelling the nation to face fire-fighting situations almost every where, besides causing immense time and cost overruns and putting unbearable pressure on the precious national resources. This situation also calls for development of an appropriate framework for the correct understanding of the issues, and for their meaningful resolution with the holistic perspective.

- Yet another dimension to the problem - despite fairly good efforts to harness the water resources over a long period of time - is that somewhere we have lacked in proper management of projects during their conception, construction, or

operational stages, again owing to the conspicuous absence of a proper framework.

As a result, India is witnessing the water crisis. The situation also highlights the fact that the nation could wake-up to realise the gravity of the problem only after reaching a precarious state. Besides, such a situation is also fraught with the risk of future water resource development taking up a skewed path, where policy planners of the nation may tend to ignore the existence of less-vocal and non-vocal entities. The prevailing crisis is multidimensional since it encompasses in its fold social, political, economic, environmental, and human aspects, besides the technical issues connected with water resource development and management. Thus, issues such as groundwater depletion, chronic droughts, recurring floods, river sharing disputes, displacement of people by dam construction, problems of water conveyance and pilferage, excessive usage and water logging, sectoral and regional conflicts amongst project beneficiaries, project stagnations and the state of financial quandary, enormity of investments and meek financial returns, impact on ecology and environment, etc. fill up the canvas of water resource development problem; besides, being intricately interwoven, they make the problem more complex.

Water being in the public domain, political administrators too are not left aloof from the crisis. This has lead to different perspectives and approaches to resolution of water crisis. The public domain is dictated by the concept of "public welfare" while the individual user is compelled by the need for fulfilment of "self interest", leading to a question of public choice, of exercising the public good, for greater welfare *versus* the individual profit. This seems to be analogous to stakeholders' value maximization *versus* shareholders' wealth maximization. This makes the problem a managerial issue, demanding a solution from

stakeholders point of view where competing interests are sought to be balanced without sacrificing the public good.

2 RATIONALE OF THE STUDY

Despite India being one of the forerunners in the world in exploring its river water resources, 'water' has become the biggest crisis[7] facing India in terms of severity, geographical spread, and number of people affected by it. The water availability to a larger segment of Indian population is diminishing; their needs of comforts, livelihood, and at times even survival, have been increasingly left to the vagaries of rain. India's disparity in water resource development, and its actual efficacy in terms of mitigating water related hardships, portrays the paradigm of water resource management.

Hitherto, the issue of managing water resources has primarily been viewed from technical, social, environmental, economic, political, and even emotive (e.g. national / state pride, or religious fervour) standpoints creating different perspectives; hence the manner in which they are approached further compound the original issues rather than leading to their solutions. When viewed from the technical angle, the issues tend to congregate around vast networks of rivers traversing the country, and impounding of rivers at viable locations (and conveyance of its water through long distances) becomes the core advocated solution; while the same is opposed from social and environmental angles, defeating the centralised developmental approach. To obviate this, the suggested approach for decentralized and smaller-scale development, is not rated as efficient, technically sound, and financially viable. When seen from the economic angle, even large-scale projects, inefficiently run by government organizations, are termed as

compounding the crisis; and hence recommended for functional divisions with greater private participation.

Seemingly, the problem continues to be unabated owing to the piece-meal approach instead of a holistic approach for water resource management from national perspective encompassing the needs of competing and conflicting stakeholders. This calls for a deeper probe for better identification of the issues, and development of an alternate managerial approach that would not only help in resolving the issues but also arresting the time and cost overruns in the implementation of mega river projects, leading to saving of scarce national resources besides ensuring social harmony. Hence, the present study has been undertaken with the purpose of resolving the issues of water resource development in India with an approach that is radically different from the prevailing approach. While seeking a holistic perspective of the problem, an interdisciplinary approach is attempted which not only aims to dismantle the barriers between the fields of engineering, social sciences, environmental sciences, etc.; but also seeks a paradigm shifts in the policies and approach of the highest regulatory level, functioning of the intermediary institutional and organizational levels, and the lowest levels of community and individual behaviours, so as to enlist all the stakeholders.

The stakeholder management approach adopted in the study is expected to help in incorporating solution-focussed initiatives in re-examining some of the vexed issues, solutions of which have been elusive due to the problem-centred approach. It will hopefully provide the much-needed impetus to shift the current focus of the country from 'water resource development' to 'water resource management', facilitating a balance among supply-side and demand-side initiatives. It may not only lead to an in-depth

understanding of the issues of interstate river water sharing conflicts, but also help in evolving a more realistic, rational, and scientific way for resolution of conflicts. The tool of stakeholder management will also manifestly help in identifying and classifying all the stakeholders of a water resource project, which in turn may help in properly focussing the entire gamut of project related issues and problems. Besides, the tool may also provide an orderly mechanism for resolving formidable challenges put forth by numerous stakeholders impeding the completion and subsequent operation of projects. Further, this approach may also help in evolving and implementing the much-needed institutional and regulatory reforms for correcting the present approach to development.

3 OBJECTIVES OF THE STUDY

The study seeks to develop a holistic stakeholder model with the national perspective for managing the country's water resources. Specifically, the study seeks to:

(i) Expound the issues underlining the water crisis and water resource management.

(ii) Identify, classify, and understand needs of varied stakeholders of water resources, so as to understand the dimensions of the conflicts.

(iii) Delineate the stakeholder approach to water resource development and management from both problem and solution perspectives.

(iv) Develop and test the stakeholder model for water resource projects.

(v) Identify the information needs for managing the stakeholders of the water resource projects within the framework of stakeholder paradigm.

4 METHODOLOGY OF THE STUDY

Conceptualisation is the necessary precondition for the development of a framework that aims to provide a reference point for attaining the solution. The research problems are of three types: action, conceptual, and value. This study is directed towards identifying the specific actions related to the water crisis. Inductive reasoning, in which individual events are observed and interpreted, drives this study. Thus the research methodology falls in the domain of qualitative research without sacrificing requisite quantitative analysis wherever needed. The case-study tradition was chosen because this method is best suited in situations in which the goal of research is to gain understanding and meaning of a given situation as also to expand and generalize the theories (analytical generalization), and not to enumerate frequencies (statistical generalization) (Yin, 1989).

4.1 Data Sources

Data needed for the study have been ferreted out both from secondary as well as primary sources. The Report of the National Commission for Integrated Water Resources Development (1999) and various reports of the Central Water Commission and the Union Ministry of Water Resources have been used to obtain data relating to water resource development and policy issues. It has been supplemented with data obtained from various journals, newspapers, magazines, and websites of such agencies - as World Bank, World Health Organization, Pacific Institute, International Rivers Network, The Association of International Water and Forest Studies, Centre for Science and Environment, Tata Energy Research Institute, World Commission on Dams, etc.- which are engaged in the

dissemination of information regarding water scarcity, pollution, resource development, and related issues of governance.

Data relating to the Sardar Sarovar Project have been obtained from the Report of Narmada Water Disputes Tribunal's Final Award (1979) and numerous reports on the Sardar Sarovar Project by Government of Gujarat, Narmada Control Authority, and Sardar Sarovar Construction Advisory Committee. Data from several independent studies - sponsored by the Narmada Planning Group (Gandhinagar) –on the technical, economical, social, and environmental aspects of the Sardar Sarovar Project were also available from different reports of Government of Gujarat. Data relating to various stakeholder issues have been obtained from the World Bank's Report on Sardar Sarovar Project; petitions of different parties in the Supreme Court of India on the project related case filed by the Narmada Bachao Andolan (Civil Writ Petition No. 319 of 1994); and the interim and final decisions of the apex court. Interviews were also conducted with different executives and stakeholders to obtain necessary data wherever needed, but their anonymity is maintained due to the sensitiveness of the issues.

4.2 Time Span

The study has examined the course of independent India's water resource development and the conflicting issues encountered during the nine five-year-plan periods, starting from year 1951 (beginning of the first five-year-plan) and ending with year 2002 (end of the ninth five-year-plan).

The case study of Sardar Sarovar Project covers a time span of two decades, starting from December 1979 corresponding with the Final Award on sharing of Narmada water by the

Narmada Water Disputes Tribunal, and ending with March 31, 2004 corresponding with Narmada Control Authority's clearance of dam height for an intermediate level of 110.64m that would enable commencement of partial benefits of power, irrigation, and drinking water from the project.

4.3 Techniques of Analysis

The study adopted heuristic approach for developing the stakeholder model for water resource management and therefore largely theoretic-analytical technique was used. Since the study related to development of holistic model for water resource management in public domain, it was imperative to review all the methods used for water resource management and issues related to water crisis as well as demand and supply of water in the context of stakeholder approach to water resource project management. For this, analysis of the completed and the ongoing projects was carried out to identify the problems and issues as well as the interest of varied stakeholders by using the concepts of social welfare so as to design the stakeholder model, followed by the case study of the Sardar Sarovar Project to gauge the applicability of the model. Wherever needed, appropriate mathematical and statistical tools have been used to forecast the impact of water resource project on beneficiaries as well as adversely affected stakeholders. For proper implementation of this model, key information inputs have also been identified so as to sense, signal, strategise and effectively engage in resolution of competing claims so that projects are better managed; and to this end, the needs of management information system have also been included.

5 SCOPE OF THE STUDY

Demarking the development zone, the water resource sectors are often seen with regional spread confined to the boundaries of states. This approach to development has come into practice because of the interpretation of the Indian constitutional provisions, in which 'water' is treated as falling under the state-subject-matter. Since the major controllable source of supplying water is rivers, and since the river basins (which form the meaningful hydrological unit) are practically not confined to state boundaries, there has been demand for development of water resource sector focussing on river basins. But, even viewing the issues of water resource sectors as limited to the watershed lines of river basins may not be enough; naturally so, because of the wide disparity in the supply potentials of different river basins, and because of the fact that basin-wise demands are not in proportion to their supply potentials. Thus, for overall water resource development of the country the depiction of the real expanse of the water resource sector – for identification and resolution of all water related issues – needs to be done by trespassing the boundaries of the states and even that of the river basins. This expanded horizon of the water resource sector - stretched up to the geographical limits of the nation – is adopted; and defines the scope of the study.

Since what finally transpires in nature is not the outcome of human manipulations alone, even the national boundaries cannot confine the rivers, and river basins. In fact India is a co-sharer of its many important river basins (e.g. Indus basin, Ganga sub-basin, Brahmaputra sub-basin, Meghna sub-basin, etc.) with six of its neighbouring nation states (namely: China, Pakistan, Bangladesh, Mynmar, Nepal, and Bhutan). In a perceptible way, the development of water resource sector in India also influences and gets influenced by these six neighbouring countries, though the issues related to them are

entirely of a different character and class. Such issues of international dimensions are considered as falling beyond the scope of this study; and hence not included.

6 LITERATURE REVIEW

The concept of free enterprise has grown to a position of undisputed dominance, and close on its heels is the evolution of the management theory, with its foundation rooted on social issues of business development. This has been enumerated by Lucas Henry (1960), David Thomson (1962), and William Roth (2000). Lee E. Preston (1986), Alan Berkeley Thomas (1993), and Likert Rensis and Jane Gibson (1976) have also spelt out many such issues that have social dimensions which have been agitating the management philosophy. The stakeholder concept has evolved as part of the modern management theory mainly because of the social nature of business which has led to emergence of social responsibility of business enterprises. This evolutionary process of stakeholder management has been succinctly covered by William C. Frederick (1987), and R. Edward Freeman and Daniel Gilbert (1988). The stakeholder management has emerged from an indistinct concept in the nineteenth-century Briton, into a vital tool of management in the modern world of boisterous entrepreneurship. David Wheeler and Maria Sillanpaa (1997) described the growing legitimacy of stakeholders in large companies, and have shown that development of loyal and inclusive stakeholder relationship has become one of the most important determinants of the commercial viability and business success in the twenty-first century.

Inspiration for stakeholder inclusiveness has largely come from the visions of Robert Owen, William Morris, and Max Weber (1947); and the latter-day stakeholder advocates have incorporated the related concepts in their management theories. William Frederick

(1987), H.R.Bowen (1953), Keith Davis (1974), and Robert W. Ackerman (1973) have worked on the concepts of corporate social responsibilities. Susan B.Foote (1984) has looked at the scenario with respect to the changing legal environment. Archie B. Carroll (1979), Steven L.Wartick and Philip L. Cochran (1985), and Sandra L. Homes (1978) have worked in the area of development of conceptual model of corporate social performance. Lee Preston and James Post (1975) have detailed the principles of corporate responsibilities; while John R.Boatright (1988), Edward Freeman (1990, 1991), Mark Pastin (1984), Frederick B. Bird and James A. Waters (1989), and Ronald Berenbeim (1987) have elaborated upon the concept of ethics in business. John Kay (1995), John Kotter and James Heskett (1992), Manfred Davidmann (1982), Max Clarkson (1991), D. Cohen and L. Prusak (2000), and Klaus M. Leisinger (1994) have examined the role of business ethics in improving corporate performance. G.C.Maheshwari (1985) has covered the developmental needs of corporate social audit, while A.C.Svendsen, R.G.Boutilier, R.M. Abbott and D. Wheeler (2002), and R.L.Brummet (1973), have looked into aspects of measurement of corporate social response. Manuel Castells (2000) has examined the impact of networked stakeholder influences on businesses; and J.Plender (1997), Edward Freeman (1984), and Liam Fahey and Narayanan (1986), have further worked in the direction of stakeholder-oriented strategic solutions for business problems. D. Wheeler and J. Elkington (2000), and Mary O' Sullivan (1998) have enquired into the issues of business linked sustainable development, and the role of corporate governance.

The concept of stakeholder management -with aims rooted in social responsiveness - is well researched for the purpose of free business enterprises of mainstream economics; but sufficiency of research work is not so evident in its application in the management of public-domain ventures that relate to the theme of social economics. The Great Kautilya

(150 AD), who laid the foundation for a responsive public administration system, stated that "*In the happiness of his subjects lies the kings happiness; in their welfare his welfare. He shall not consider as good only that which pleases him but treat as beneficial to him whatever pleases his subjects.*" (1.19.34, K.A.). Despite this historical background, the public-domain ventures in India are in no way geared-up for stakeholder inclusiveness; and this is amply evident in the case of water resource project management.

It is not that the stakeholder issues are non-existent or not understood in case of water resource projects; rather the issues are extensively heightened, but often meted with a compartmentalised treatment wherein holistic management perspective is conspicuously missing. Since water resources essentially fall under the social domain world over, the diverse issues of its development have been extensively analysed and reported upon by several international forums in different context. For example, the water related global issues of demand, availability, and management, have been probed by the World Health Organization (Reports, 2000), Food and Agriculture Organization (Report, 1996), United Nations Development Programme (Report, 1990), Asian Development Bank (Workshop Proceedings, 1996), International Water Management Institute (Report, 1998), and World Bank (Report, 1992); while the issues of its sustainable development have been examined by the United Nations (Johannesburg Summit, 2002), International Conference on Water and Environment (1992), Second World Water Forum (2000), World Commission on Dams (2000), International Institute for Sustainable Development (Report, 1999), International Commission on Irrigation and Drainage (1993), and International Union for the Conservation of Nature (Strategy Report, 2000). The forums like Pacific Institute (2002), International Rivers Network (2001), and The Association of International Water

and Forest Studies (1996) have also focused on sustainability issues while opposing the large-scale development of water resources for commercial purposes. Work on the global issues of water resource development and management have also been carried out by several scholars. Peter H. Gleick (1996; 1998; 1999; 2000; 2002) has extensively dealt with the issues of extent of water requirement, human rights for water, sustainability issues of development, economic aspects of water, and risks of water privatisation. The economic and privatisation issues of water have also been covered by D. McNeill (1998), W. Bardelmeier (1995), J.A. Beecher (1997), Cowen Brook (1999), and P.Rogers and R.Bhatia (1997). R. Engelman and P.Leory (1993) have looked into the issue of population growth and water sustainability; while M.M.Cernea (1998) has examined the issue of resettlement of people affected by water resource projects.

In the Indian context, the stakeholder related issues of water resource development have been covered in an isolated manner by numerous authors, and governmental and non-governmental organizations. The issues of water availability, the demand, and the planning aspects of its development have been mostly covered by the Central Water Commission (1988; 1989; 1990; 1993a; 1997; 1998a), and the Union Ministry of Water Resources (1980; 1987; 1996a; 1997). The aspects of water availability and issues related to its demand have also been looked into by K.L.Rao (1975), M.S.Swaminathan (1991), Indian Water Resource Society (1999), and A.Agarwal, J.Kimondo, G.Moreno, and J.Tinker (1981). The Planning Commission (1983), Central Water Commission (1992a), and B.N. Navalawala (1999; 2001) have discussed the issues of financial conditions and viabilities of water resource projects. The issue of water pricing has been examined by R.Pandey (1997), Dinar and Subramanian (1997), and Central Water Commission (1993b). Issues of environmental impact have been covered by Central Water

Commission (1998b), Centre for Science and Environment (2002), Samar Singh (2002), Alvares, Glaude & Billorey Ramesh (1998), N.K.Sharma (1985), and M.C.Chaturvedi (1991). The issues related to conditions of project-affected people and requirements of their resettlement have been dealt by Medha Patkar (1990), Jai Sen (2000), Enakshi Ganguly Thukral (1992), Arundati Roy (1999), Anil Agrawal and Sunita Narain (1999a), B.G.Verghese (1994), S. Guggenheim (1990), and Central Water Commission (1992b). The Ministry of Water Resources (1995; 1996b; 1998), Centre for Science and Environment (1998), Chhatrapati Singh (1991), K.B.Kurup (1991), B.N. Navalawala (1998), A.Vaidyanathan (1999), and Anil Agrawal and Sunita Narain (1999b) have also discussed the issues of water rights, governance, and need for people's participation.

The most comprehensive and recent compilation on water resource development in India has been brought out by the National Commission For Integrated Water Resource Development (1999). However, in absence of a holistic stakeholder perspective, the views of Commission has largely remained in the ambit of mainstream thinking, without suggesting any implementable measures for overcoming the present crisis - a limitation which has been even recognized by Ramaswamy R.Iyer in his note to the report of the Commission[8].

7 PLAN OF THE STUDY

Besides the introductory first chapter, the study spans over six other chapters. The second chapter provides the backdrop to the concept of stakeholder paradigm in management. The third chapter provides a stakeholder management perspective for India's water crisis, challenges of meeting demand and supply gap, interstate water sharing conflicts, impediments in project construction, and finally dilemmas of project operation. The

fourth chapter identifies and classifies varied stakeholders of water resource projects with a view to develop stakeholder model as a conceptual framework for understanding stakeholder issues. In the fifth chapter, the stakeholder dilemma is implored by a case study of Sardar Sarovar Project, which covers overview of the managerial aspects of project formulation, implementation as well as future operations. This is followed by development of a stakeholder model for the Sardar Sarovar Project so as to understand its total stakeholder spectrum. The sixth chapter presents the stakeholder approach for the managerial solutions of the issues, and the application of '4S' functions (Sensing, Scanning, Signalling, and Strategizing) of stakeholder model in the continuum of problem set, along with the needs of effective Management Information System; besides highlighting the institutional and regulatory reforms needed for entailing the stakeholder approach. The seventh, and final, chapter presents the summary and recommendations of the research study, besides identifying the areas for further studies.

Notes:

1. Bounded by the Himalayas in the North, India stretches southwards and tapers off into the Indian Ocean, with Bay of Bengal in the East, and Arabian Sea in the West. Lying between $8^0$4' and $37^0$6' North Latitudes, and $68^0$7' and $97^0$25' East Longitudes, the landmass forming sub-continent of India covers an area of about 329 million hectares. With a land frontier of 15,200 km and a coastline of 6,083 km, it is divided into seven physiographic regions: Northern Mountains, Great Plains, Central Highlands, Peninsular Plateaus, East Coast Belt, West Coast Belt, and Islands (CBIP, 1998). Besides the characteristic climatic conditions influencing rainfall, these regions have physical traits such as mountains, plateaus, plains, geology, forests, rivers etc, bearing on the assimilation of water in the form of rivers or other surface and subsurface reserves, and the utilization thereof. India's geographic regions are shown in Plate I; while variation in the average rainfall along its geographic regions is shown in Plate II, and the compounded effect in terms of water stressed and scarcity areas is shown in Plate III.

2. The parameters of physical features, geological structure, climatic conditions, etc are not exactly fixed in an absolute sense; instead show variability. For example, the Indian water resource problem is affected on a long-term basis by the constantly rising Himalayan Mountains; by the melting of glaciers; and by the global warming and its impact on

snowmelt and monsoon pattern. On a short-term basis, these parameters cause yearly variations, or cycles of variations, in the rainfall. However, these parameters are still termed as fixed because of their being governed by natural forces; and because of our inability to manoeuvre them, so as to alter the present problem, in any manner.

3. The factor of population growth is limiting in the sense that it negates our continuous developmental efforts for meeting country's water demand. Thus, country's demography, with unidirectional variation, constantly enlarges the extent of water resource problem. Further, with no possibilities in sight of reducing the population, its impact is practically irreversible.

4. The river valley projects draw heightened attention for two perceived reasons: one, if the large-scale supplies from water resource projects are not available, people eventually resort to over extraction of the groundwater, thereby leading to water crisis; and two, the water conservation and ground recharging measures at local levels get ignored, leading to depleting groundwater tables and eventually water crisis, due to the over emphasis being given to the water resource projects. However, the perceived linkages between river projects and the issue of overall water resource development are somewhat overstated. First of all, the water stress in the country is not merely because of insufficient supplies from water resource projects, but also for the reasons of whopping demands. Secondly, contradictory to the general notion, development of water resource projects and that of local conservation measures can easily go hand-in-hand.

5. The debate between the proponents and opponents of the dam often continues with one segment rallying with the flock of people gaining from the water resource project, while the other leading the pack of people suffering from it, eventually adding the cause of ecology and environment as well. Hardened in their views over the last two decades (the period that also coincides with the stagnation of further development, and also peaking-up of water crisis), the two groups of project proponents and opponents have distanced away from each other, despite the common objective of improving the water situation. Today, when the possibility of a discussion or a reasoned debate between the two diametrically opposite schools of thoughts has become nearer to impossibility, their collective dominance in all dialogues on the subject has also negated the emergence of a third view.

6. In all most all the controversies related to the water resource projects, the dam is considered synonym to the entire project. Though the dam is central to the issue, yet it is only one of the three major components of any multipurpose water resource project, namely the dam, canal network, and hydropower complex.

7. The UN World Water Development Report (2003) ranked India as low as 133rd amongst 180 countries in terms of water availability, and 120th amongst 122 in terms of water quality, despite India's vigorous efforts in harnessing water resources during the last five decades.

8. The National Commission For Integrated Water Resource Development was chaired by S.R.Hashim (Member of Planning Commission) and included 13 other members, viz. V.Ramachandran, V.S.Vyas, D.N.Tewari, S.Prakash, C.C.Patel, Bharat Singh, S.P.Caprihan, Ramaswamy R.Iyer, B.G.Verghese, P.Mohandas, A.D.Mohile,

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D.K.Chadha, R.K.Parashar. The view of Ramaswamy R.Iyer on the basic philosophy of water resource development was radically different from those of other members.

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