STAKEHOLDERS' PARADIGM FOR MANAGEMENT

A Study of Sardar Sarovar Project

A SUMMARY OF THE THESIS SUBMITTED
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
MANAGEMENT STUDIES

BY
B. RAVI KUMAR PILLAI
M.Tech (I.I.T. Delhi), M.B.A. (M.S.University of Baroda)

UNDER THE SUPERVISION OF
PROF. (DR.) G. C. MAHESHWARI

AUGUST 2004

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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 such as India's physical features, geological structure, climatic conditions, etc., collectively constituting the 'fixed parameters' of the problem. The problem is further complicated by the unabated growth of population, 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. The people adhering to either of school of thoughts are polarized in their viewpoints, and often emotionally charged 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', 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.

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 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.

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.

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).

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, International Union for Conservation of Nature, 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.

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.

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.

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.

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.

SUMMARY OF THE FINDINGS

The Stakeholder Management Concept

In India, water resource projects are reckoned as falling in the domain of social economics; on the other hand the stakeholder concept has been applied on the management areas of mainly mainstream economics, rather than of social economics.

However, the application of stakeholder concept in water resource management can be appreciated on the ground that many of the ailments of water resource projects have been on account of their state-owned nature. But, shifting of water resources entirely to the private domain has much more sever consequences. Probably, the optimal solution lies in the company form of ownership wherein the stakeholder approach can be appropriately applied without affecting the public-domain status of the project.

Parallels can be drawn between business and water resource development in following ways:

i) As observed in history of business development, water resource development also suffers from innumerable instances of acute conflicts, which are essentially between individual interest and the overall societal interest.

ii) Water is becoming a scarce resource, causing an unwarranted competition amongst different users. This is akin to scarcity syndrome prevalent among stakeholders of business due to perceived deprivation. Scarcity mentality concerned with distribution of water and that of wealth (in business) are similar - "those without would go to any length to gain a share while those with would go to any length to protect and, as insurance, to increase their share."

iii) Similar to business, the competition for water may have two levels. The states / regions / user-sectors are players on the first level and may win or loose while increasing their share, but the nation is on the second level always winning. However, for want of a referee the interstate and interregional tussle for water are not fair, and hence most of the competitions turn into conflicts, where the nation looses irrespective of who wins the conflict.

iv) The development of water resources can take place only at certain social and environmental costs, which are often exacerbated by the protagonists of the projects. This tendency can be rightly compared with the tendency of business owners to espouse for growth of wealth in the name of economic development, even at the cost of immense human sufferings and environmental degradations.

v) Because of wide interactions with environment, the water resource development portrays the best case where 'whole' is more than the sum of its parts. As seen in business, the correct remedy lies in application of "Systems Approach", which studies the interactions of parts as well as that of parts with the macro environment with a view to develop a fit. It also encourages the study to move outward, fostering an interdisciplinary approach.

vi) Similar to business development, water resource development also suffers from the flaw of omission of human element; and the best course lies in maximizing assimilation of "human values" and internalising "social accountability" while viewing projects as *socio-technical* systems rather than merely *techno-economic* systems.

vii) With focus on short-term generation of wealth, business enterprises tend to overlook the rightful needs of its consumers. In the case of water resource projects, the short-term objectives - often political - lead to jeopardising of the interests of project beneficiaries. However, here - unlike in business - the empowerment of project beneficiaries are meekly attempted, or accomplished.

The management philosophy has evolved closely on the heels of business development. The stakeholder concept is the most acceptable management form today, which is sought to be applied to water resource projects as well. Despite stemming from revolutionary

developments in enterprises, the stakeholder concept was actually evolutionary; and its important phases of progression can be identified as: (i) origin of corporate social responsibility concept; (ii) shift from the concept of social responsibility to social responsiveness; and (iii) concept of business ethics, leading to the present-day form of stakeholder concept.

The main characteristics of today's stakeholder concept are as under:

i) Elements of environment are increasingly getting included as stakeholders. Thus, in comparison to 'stockholders', the 'stakeholders' represent a larger and more varied community who are affected directly or indirectly by an organisation's pursuit of its goals.

ii) Stakeholders directly influence an organisation; and so are elements of the direct-action environment. Indirect-action elements (e.g. technology, economy, and political groups) have the potential to become direct-action elements or stakeholders.

iii) The ability to understand and satisfy the expectations of multiple and diverse stakeholders has become an essential corporate competency factor.

iv) A concept of corporate social reporting has also come into practice in order to communicate corporate responses to various stakeholders; and possible areas of reporting are: Net Income Contribution, Human Resource Contribution, Public Contribution, Environmental Contribution, Product/ Service Contribution, and Knowledge Contribution.

v) The concept of corporate accountability however suffers for want of a basic unified theoretical framework for evaluating societal performances of business.

vi) Corporate performance is being linked with issues of sustainability; leading to a demand for assessing their performances against a 'triple bottom line' of economic development, environment quality, and social justice/equity.

vii) The stakeholder approach to management is now being globally emphasised, also bringing into perspective the concept of corporate governance.

viii) Three levels of corporate stakeholder relationships have been identified, and these are: Compliant, Responsive, and Engaged.

ix) The link between stakeholder relationship and the company's competitive advantage is manifested in areas of: Shareholder risk, Innovation, New markets and opportunities, and Reputation and Brand Value.

x) Stakeholders act as gatekeepers to the resources that a firm needs; and stakeholder relationship is an indicator of its capability in accessing the valuable resources.

xi) Proper measurement systems are the only way to understand and respond to shifts in stakeholder expectations. But, developments of measurement systems – broadly of 'impacts' and 'quality' type indicators - are in their infancy.

xii) Another approach for measurement of social relationship is the concept of 'social capital' formed by the organisation's reputation and trust with its stakeholders. But, it is fraught with attendant measurement issues.

Raison D'être for Water Crisis - The Stakeholder Perspective

With a limited and invariable share of the world's water resources, India's population is ever increasing, thus ever decreasing the per capita availability of water. Besides, the water usage pattern is changing resulting in the rise of per capita consumption. Since, most rivers criss-cross the boundaries of different states, the sharing of river water gives

rise to interstate water conflicts jeopardising many of the viable and important projects. Further, the complex impeding factors during construction immensely delay the ongoing projects, alter their scope, or immobilize them permanently. Finally, the pressure brought by beneficiaries interferes with operations of completed projects, disrupting judicious / equitable / efficient distribution of limited resource.

India's inability to bridge the demand and supply gap is the structural aspect of the water crisis; but impregnable tenor to the crisis is given by the non-structural aspects such as: (i) absence of a national water vision that is also reflected in absence of an effective population policy; (ii) inadequacy of water usage, water quality, and water regulation laws; (iii) archaic laws on river water rights, lack of centralised planning and absence of meaningful and effective central role on the interstate rivers; and (iv) intense and contradictory influence on the projects from too many players, and inability of the project to sense, pre-empt, or guard against such influences.

The ever-increasing imbalance in the demand and supply is the core cause of the water crisis, which can be managed by enhancing supply (supply-side solution), or by curtailing demand (demand-side solution), or by both. The domain of supply-side challenge is constituted of three components, viz., (i) creating new potentials for enhancing supply; (ii) achieving equitable distribution; and (iii) meeting the needs of sustainable development. An acceptable and sustainable solution has to be found encompassing all three challenges.

The domain of demand-side challenge is also constituted of three components, viz. (i) creating new technologies for reducing water demand; (ii) bringing change in the societal mindset about water usage; and (iii) initiating and enforcing water related structural

reforms. Success in each case, would independently add to overall success of the demand management. Till now, the option of demand-side solution has been grossly ignored. But since the challenges of supply-side solution are becoming increasingly difficult, the option of demand-side solution presents a viable option for containing the crisis.

Implying moral /legal claim on water, the three references for water rights relate to: (i) right of ownership (solely or jointly) on a source of water; (ii) right on a quantum of water for use from a specified source of water; and (iii) a citizen's (civil) right to a fair quantum of water. The first two references imply existence of an inherent condition that the water source lies within the limits of property owned by the collective entity. Absence of this inherent condition - in the context of states - makes both types of water rights irrelevant, thus calling for focus on the third reference.

Because of improper conceptualisation without taking into account the varied environmental and social aspects, the water resource projects suffer from time and cost overruns invariably putting severe strains on the project funding requirements. Projects' estimated cost multiply manifold because of the factor of price escalation linked with project's time-overrun. The magnitude of cost escalation, besides depending upon extents of delay, is also linked with the timings of the delay. Even definite factor of escalation - matching with planned activities - are ignored in original estimate, leading to gross underestimation of project costs. With an annual inflation of 12%, a project with 10year construction period and uniformly spread out expenditure would go through a cumulative escalation of about 75%. The amply evident flaw in estimation continues to exist for reasons such as: (i) the inflation rates in India have been highly dynamic, hence the unreliable factor of price escalation is ignored in the otherwise concrete exercise of

estimation; (ii) projects are only subjected to economic viability analysis on the lines of benefit-cost ratio studies, in which factor of inflation is deemed to become irrelevant; and (iii) project finances are planned to be met on year-to-year basis, hence reliable and exact knowledge of full project cost in the beginning is not taken into account.

There has been an inverse relationship between the extent of funding and the number of water resource projects undertaken. The fact that "cost of outstanding works of ongoing major projects would be nearly same, or more, than that encountered at beginning of Ninth Plan" exemplifies the vicious cost cycle.

Projects also suffer financially for reasons such as: (i) the financial requirements are increased due to recurring overheads on account of non-deployment of surplus capacities created at the investigation and design stages of the project; (ii) after lining-up of main contractors, machines procured for preliminary works are put to irrelevant and uneconomic uses, incurring further operational and maintenance costs; and (iii) the idle components (manpower, vehicles, office premises, guesthouses, transit-camps, office automation, communication equipment, heavy-duty machineries, etc) incur huge recurring costs that are subjected to inflation as well.

Budgetary allocations for operational and maintenance requirement of completed projects turn out to be grossly inadequate. The system forbids application of even basic financial wisdom for survival of any going-on concern, i.e. the concept of *breakeven-cost* for recovery of at least the *out-of-pocket* component. It also creates slack and consequently gap between revenue and expenditure, and in an indirect way widens the gap thereby inducing financial inefficiency and encouraging politically motivated low water-tariffs.

Beneficiaries of completed projects can be classified on the lines of "geographical and social segmentation", and "sectors of water allocation/uses". They have conflicting interests and bring extremely diverse influences, which become intense during scarcity conditions with political overtones that cause immense strains in project operations. The major conflict along geographical segmentation arises amongst the upper-reach and lower-reach groups of same canal system. The social segmentation is often created on caste lines that comes into play in rotational distribution of water. Collisions of sectoral interests are caused by allocation interdependencies and operational overlapping that are encountered between: (i) irrigation usage and drinking water usage (leading to rural vs. urban conflict); (ii) power generation and consumptive water usage; (iii) flood control function and other regular functions of project; and (iv) downstream releases and irrigation / drinking water releases.

Stakeholder Model for Water Resource Projects

Individuals or group of entities that may be affected during conception, construction and operation of a water resource project; and who in turn may bring influence on course of the project are treated as project stakeholders.

For stakeholder identification and classification, a three-tier approach based on Beneficiaries / Adversely-affected, Social / Non-social, and Primary / Secondary elements has been used. This has led to the eight-fold stakeholder classification, viz., (i) Primary Social Beneficiary (PSB) Stakeholders; (ii) Secondary Social Beneficiary (SSB) Stakeholders; (iii) Primary Non-social Beneficiary (PNB) stakeholders; (iv) Secondary Non-social Beneficiary (SNB) Stakeholders; (v) Primary Social Adversely-affected

(PSA) Stakeholders; (vi) Secondary Social Adversely-affected (SSA) Stakeholders; (vii) Primary Non-social Adversely-affected (PNA) Stakeholders; and (viii) Secondary Non-social Adversely-affected (SNA) Stakeholders.

The above eight-fold classification of stakeholders is structured into a model (Octagonal Congregate) indicating the interactive influences of stakeholders on the project in the manner listed below:

i) The beneficiary and adversely-affected groups divide the sphere of stakeholders' influence in two halves, with cumulative influences acting in opposite directions.

ii) Segregation of social and non-social stakeholders into two halves exhibit the manner and intensity of influence brought about by stakeholders on the project.

Besides influencing the project, stakeholder groups also influence each other creating a web of influences on project in a networked fashion that may lead to resonant implications. Identification of pattern of collision or collusion in different categories of stakeholders provides pathways for enhanced and improved people oriented accountability in tune with the equitable and distributional goals. Failure to understand this route jeopardizes the goal rendering bureaucracy-client relationship weak, leading to entrenched political behaviour detrimental to both the project and society.

Case Study of Sardar Sarovar Project

Sardar Sarovar Project (SSP) was chosen as a case study for reason that it purports a supply-side solution underlying stakeholder conflicts, which were often heightened under aggressively emotive and political campaigns, judicial interventions, and extensive media coverage. Secondly, the project brings into sharp focus the restrictive nature of judicial

tribunal while seeking resolution of the interstate river-water sharing dispute. And, thirdly, it was an omnibus project encompassing myriad problems of project conception, construction, and operation. These reasons impeded the progress of project work giving rise to: (i) prolonged litigation in the Supreme Court; (ii) enduring agitation by anti-dam groups; (iii) shortcomings in execution of resettlement and rehabilitation programme; and finally (iv) conflicts amongst beneficiary states of the project, which heightened the other variables.

The critical effect of impeding variables has influenced the financials of the project leading to cost sharing dispute of major expenditure components which still continue to plague the interstate relations. The faulty initial cost estimates and cost escalations caused by rising prices - which did not form part of estimate process – and inability of the party states to timely pay their share dues, hinders the financial planning of the project. The delays in dam construction has increased the costs due to price escalation and enhanced scope of rehabilitation works, besides increasing the liabilities for debt servicing.

Besides increasing the cost of project and causing immense loss of accruable benefits, the other financial implications of delays in dam construction were: (i) problems of prolonged idle-condition maintenance of completed powerhouse; (ii) safety and maintenance of vast stretches of completed canal network; (iii) recurring damages to stilling basin of hydraulically unsuitable truncated dam; and (iv) contractual problems related to frequent and open-ended work extensions.

Constituents of internal environment of SSP are its stakeholders. All elements of direct-action external environment and a part of indirect-action external environment are also

stakeholders. The stakeholders of upstream Indira Sagar Project (in Madhya Pradesh) are stakeholders of SSP as well. The SSP stakeholders are distinct in many ways because of the large size, geographic and climatic conditions, and the multi-state nature of the project.

The stakeholder model brought out the following three characteristic features of the Sardar Sarovar Project: (i) form of project's affect on stakeholders (beneficial or adverse); (ii) nature of the stakeholders (social or non-social); and (iii) impact of affect on stakeholders (primary or secondary). The key stakeholders have been put to closer examination for fathoming their potential to influence the course of project, and for understanding the nature of issues.

Stakeholder Approach for Water Resource Management

Critical problems associated with water resource projects are essentially stakeholder related. There is a need to evolve an apt approach for seeking solutions in the continuum of problems' set; and tool of stakeholder approach is justifiable on following grounds:

i) All problems associated with projects pertain to the spectrum of stakeholders.

ii) Stakeholder approach provides the much-needed interdisciplinary perspective.

iii) The heterogeneous problems cannot be fathomed using same yardstick or solved in a unified manner; this can be appreciated by stakeholder approach.

iv) Neither stakeholder parameters nor their combined influences are static. The vibrant pulse of the problem can be deciphered judiciously by stakeholder approach.

Considering the gravity of India's water crisis, there is unquestionably an urgent need for incorporating stakeholder approach in its entirety, in following manner:

i) Issue of demand and supply imbalance - Seeking a total supply-side solution is increasingly becoming unattainable. However, since a demand-side solution in itself cannot provide a whole solution, there is a strong case for attaining a balance in the supply-side and demand-side solutions.

ii) Issues of water rights and river sharing conflicts - The complex issue cannot be tackled through limited perspectives of Judicial Tribunals. Even solutions like networking of rivers may not be viable without addressing the root cause of the problem. Conflicts are not because of real deficiencies, but because of the notion of deficiency in availability of river water to a state owing to inaccurate measure of its requirements. The obvious solution hence lies in realistic assessment of water requirements at all domain levels, and establishment of such requirements as legally tenable water rights.

iii) Issues of project construction and operation - The complex issues can be addressed with stakeholders' perspective using stakeholder model. The model would help in (a) identifying and classifying the stakeholders, (b) understanding the extent to which project affects them, (c) gauging the intensity and directions of their influences, and (d) grasping the manner in which influences are brought. The model thus can provide a vital tool for (i) comprehending and resolving formidable challenges put forth by stakeholders, (ii) evaluating project's status of stakeholder-awareness and level of stakeholder-relationship, (iii) analysing past decisions that have gone wrong and effecting remedial measures.

In order to obviate the extremely conflicting stakes and with a view to resolve the legitimate concerns, the better recourse for the project is to create a win-win situation for all stakeholders so as to strike a balance in relationships with its diverse constituents as

also to optimise the realization of stakeholder value. The project's stakeholder model can be advantageously used to this end. A new stakeholder relationship model has also been suggested with four levels of managerial engagement: (i) Uninformed (Lowest level), where relationship is not acknowledged; (ii) Compliant, where relationship is under pressure; (iii) Responsive, where relationship is based on responsibility; and (iv) Engaged (Highest level), where relationship is due to responsiveness. Most of the projects fall in the 'Uninformed' level. Projects like Tehri (on Ganga) and Sardar Sarovar Project have graduated to the 'Compliant' level. But none of the projects have reached the 'Responsive' or 'Engaged' levels of stakeholder relationship.

Proper measurements of stakeholder values are the only way to understand and respond to shifts in stakeholder reactions and expectations. The proposed approach relates to measurement of 'comparative impact' of project's stakeholder-related decisions. It has the advantage of being discernible and forward-looking, while the element of perception is made irrelevant by taking a comparative measure on opposite groups of stakeholders.

Application of stakeholder model can help in following ways:

i) It strengthens the two-way interaction of project with stakeholders; and puts them in correct perspective right from the formative stages of the project.

ii) Because of much-needed financial prudence, project's stakeholder responsibilities are likely to be knowledgably ignored leading to stagnation of stakeholder relationships at 'compliant' level. With application of stakeholder model, projects can aim to attain the highest level of stakeholder relationship.

iii) Projects tend to develop bias in perceiving and reacting to stakeholder concerns. With the help of the comprehensive stakeholder model, this bias and

its consequent effect on stakeholder related decisions could be corrected. The tool can also be employed for checking the networked impact of activism of a few stakeholders.

iv) It helps in attaining an in-depth understanding of the total stakeholder spectrum; thus broadening the perspectives of water resource planners and policy makers for guiding the continuous process of national water resource reforms, targeting for balanced and sustainable development with minimum conflicts.

Apart from covering the total span of water resource development issues, the stakeholder approach also brings in dynamics to the process of managing such issues. Tool of stakeholder management in this respect serves in perpetuity the '4S' functions of:

i) **Sensing** the effects of project and project related decisions on stakeholders.

ii) **Scanning** the intensities and directions of stakeholders' return influences.

iii) **Signalling** the timing and manner of stakeholder reactions.

iv) **Strategizing** its response to the stakeholder influences in tune with stakeholder concerns.

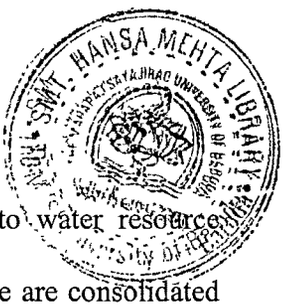
The cyclic approach of the tool is solution driven; and is expected to help in enhancing the stakeholder value besides enabling the management to attain the highest level of stakeholder relationship.

The present functioning of project organizations is characterised by fire-fighting tactics for overcoming situations evolving out of multiple stakeholder influences, rather than for a collaborative process that is essential for stakeholder management. Hence there is a need for orienting the overall functional framework of project organization towards stakeholder responsiveness; and this can be achieved by making appropriate enquiries

with respect to each division of the organizational structure, and for every aspect of the project functioning. Action points have been identified for gaining stakeholders' trust; however, 'stakeholder turned-off' conditions may also be encountered, which may call for timely analysis of such situations for affecting remedial measures.

The successful implementation of stakeholder model necessitates the need for appropriate Management Information System (MIS). The exact nature of the information needs will vary depending upon composition of project's stakeholder groups; and for a general understanding, broad information requirements in respect of Sardar Sarovar Project have been identified. Implementation of MIS will require: (i) a robust database, integrating the project and stakeholder related data / information; and (ii) a web based technique for generation of comprehensive information for all levels of decision-making and operations. A good database planning and good understanding of the requirements of MIS can help in creation of an effective, efficient, and long-lasting database structure, forming the 'stakeholder knowledge' tool.

Past approach to water resource development has accentuated the inequity in access to water resources instead of eliminating it. The situation can be corrected by recourse to the stakeholder management approach, for which reforms are entailed in: (i) policies, and the institutional and regulatory framework; (ii) people's participation for affecting higher level of decentralization; and (iii) constitutional set-up for strengthening the present weak role of the centre. After an in-depth examination of the present flaws, recommendations for restructuring have been made in all the three areas with the objective of improving the water resource project management system so as impart soundness to the system of governance.



RECOMMENDATIONS

In the course of attempting a paradigm shift in India's approach to water resource development, many propositions are made in the research-study. These are consolidated and presented here under:

1. Optimal results are possible through the corporate form of organization for water resource projects without affecting their public domain status and also enabling the application of stakeholder management tool.

2. The perpetual creation of new supplies for meeting growing demand is contrary to the principle of sustainable development. Hence demand should be curtailed through:
    a) Creating new technologies in diverse fields, viz., (i) development of crop varieties of high-yield, varieties that require lesser application of water, varieties with resistance towards low to moderate salinity, pest and insect resistant varieties; (ii) advancements in the field of soil moisture retention, enhancement of productivity by crop rotation, conjunctive use of water, recycling of animal manure; (iii) improvements in irrigation methodology to increase conveyance and application efficiencies; (iv) advancements in cost-effective treatment and recycling of domestic and industrial wastewater, and desalination technology.
    b) Changing the mindset of society towards: (i) traditional views about watering of fields so as to conserve water as well as check soil salinization through farmer education; (ii) fragmentation of farmland holdings and

need for cooperative / corporate farming; (iii) recycling of wastewater, especially for domestic use.

c) Bringing structural reforms by: (i) checking of groundwater abuse to control the capacity and power of privately owned pumps, creating proper environment for groundwater marketing facilitating sharing of groundwater sources, applying an 'area approach' for control, empowering of local level bodies; (ii) controlling the pollution of surface and ground water bodies by empowerment of local bodies and regulating agencies; (iii) checking distortion in cropping pattern caused by farm input and output pricing and export-import regulations; (iv) correcting water pricing – for creation of a deterrent level against overuse/misuse of water - by levying charges on volumetric basis and raising prices to a level where its impact becomes comparable with other farm inputs; (v) curtailing subsidies on energy charges of groundwater pumping; (vi) limited privatisation for improving distribution of domestic and industrial water.

3. For sustainable development, a balance should be achieved in demand-side and supply-side solutions. The supply-side initiatives should be corrected in following manner:

   a) Objective of water resources development should be to maximise water utilisation, which would mean planning for bare necessary new supplies after accounting for potential of demand management and supply-side improvements in existing supply capacities.

   b) Catchment Area Treatment measures should be enhanced in existing and new projects so as to reduce reservoir siltation, thus, leading to storage

salvation which would obviate the need for new creation without adverse social or environmental repercussions, besides enhancing the efficiency of the existing system.

c) Local sustainable supply potential should be estimated so as to govern the norms of domestic, agriculture, and industrial usages.

d) Adopting an incremental approach, meaningful phasing of large projects should be carried out so as to permit better time and cost controls; manageable number of oustees; sustainable impact on ecosystem; lesser potential-utilisation gap; and better planning of next phase with updated data and newer technologies.

e) Focus of construction should shift from merely cost controls to time controls with emphasis on opportunity cost of money and on time barred benefits of the project.

f) Development of whole command area should be taken up simultaneously so as to assure benefits of project - in terms of time, quality, and quantity – to all.

g) Wherever feasible the option of large-scale project (requiring larger dam) should be adopted, if found favourable from a total stakeholder perspective in a holistic manner.

4. There is urgent need for delimiting water requirements of individuals and collective communities and translating their rationally assessed requirements - including those of ecology and environment - into legally tenable water rights. This calls for the following:

a) Since broad sources of supply are surface and ground water, rights should be established on cumulative use from both sources. Water rights should mean an authorisation to use certain amount of water for specific beneficial purposes. Apart from domestic, farming, municipal and industrial uses, water rights of states should also reflect the needs of forests, other elements of flora and fauna, downstream riverine life, salinity balance etc.

b) For true empowerment at grassroots' level, the water rights of the state should be considered as a mere form of community right, which it has derived by integration of water rights from lower domain levels.

c) Correlation between consumption and availability should be taken into account while creating water rights, which can be done by suitable appropriation with adequate weights given to factors of historical usage and actual costs of supplies.

d) All options of demand-side solutions ought to be exhausted before exploiting new supply sources, and water rights should be suitably tailored to this end.

e) For usage of water over and above the allocated rights of an individual or collective entity, the trade-off should be affected with suitable compensations, which would call for development of appropriate water-right trading mechanism.

5. For meaningful translation of water rights, barriers of state boundaries needs to be dismantled for judicious, balanced and optimum use of water. This calls for the following:

a) Based on the centre's scientifically developed guidelines, each state government should workout their aggregate requirement - by integrating requirements of lower domains – and these should be construed as state's water rights.

b) After estimating the utilisable potentials, each state government should formulate a 'state water plan' indicating details of present and prospective demand patterns, and proposed supply schemes.

c) The scrutiny of 'state water plans' would enable central government to develop 'integrated water plans' for balancing the surplus and deficit situations amongst different states in the best technically and financially viable ways.

d) Any dispute on the 'integrated water plans' should be resolved within stakeholder framework by judicial tribunals, with broadened legal perspective, in a time bound manner, and without interference from courts; and tribunal's decisions should be made enforceable on all.

6. Though all major projects are subjected to environmental and social scrutiny at clearance stages, however the shortcoming lies in near absence of monitoring measures during construction and operational stages. This should be corrected for ensuring 'compliant' level for stakeholder relationship, for which instruments of societal audit should be enforced after evolving appropriate performance indicators / benchmarks. Needless to mention that the unit of measurement for different parameters may be varied until an acceptable unified measure is evolved for financial reporting purposes.

7. The pre-feasibility study of the project must incorporate the appropriate stakeholder model and attendant Management Information System. Further development of the model and MIS should go hand-in-hand with the development of Detailed Project Report so as to strengthen the governance system of project right from conception to operational stage. For this care should be taken in following respect:

    a) Identification of secondary stakeholder groups and generation of pertinent data concerning them should be consistent with the extant law.

    b) The MIS data should not be used or distorted with prejudice to any of the stakeholder entities so as not to vitiate the holistic perspective of the project.

    c) The MIS should be geared to improve project's stakeholder-related decisions in order to enhance stakeholder relationships. A system of reporting should be maintained so as to gain stakeholder confidence in a transparent manner.

8. There is urgent need for correcting the flaws in our policies, and the institutional and regulatory framework. This calls for restructuring measures in the following areas:

    a) The policy makers should realize that there are limits to finding more water; and their focus should shift to the needs of demand reduction by measures such as population control or efficient resource utilization.

    b) The tendency to misuse policies to cause serious distortions in agricultural economy –encouraging attraction for water intensive crops – should be curbed.

c) Prevailing subsidies to farmers in power (electricity, diesel, etc.) should be suitably phased out to check overexploitation of groundwater.

d) Groundwater regulation policies should be corrected to make them equitable, sustainable, and more effective.

e) The water resource planning should be done at river basin levels, and standard of project scrutiny should be strengthened overcoming all political inhibitions.

f) Keeping in view the poor state of repairs and maintenance of projects, the issue of water pricing should no more be pushed under the carpet.

g) Encouragement and incentives for water marketing, irrigation technology industries, rural venture capital funds etc. should be provided to enhance usage efficiency and to bring private investment for water resources development.

h) The financial inefficiency of irrigation projects should be corrected to reduce farm-water subsidies in real value terms.

9. The active participation of people in water resource sector has been declining, although there is an urgent need for achieving a level of decentralization that ensures both accountability and performance at local level besides enlisting the stakeholders participation. To this end, the Panchayati Raj Act should be suitably amended and enforced to confer upon people greater power to maintain and develop local resources. Care should also be taken in following respect:

   a) Right from the time of project conceptualisation, efforts should be made for creating and institutionalising formal common-interest groups, especially amongst adversely affected stakeholder segment.

b) Every project should obligatorily develop its stakeholder model, and use it to: evaluate stakeholder-oriented decisions, fathom intangible and indirect effects on adversely affected groups, and mitigate such effects at the earliest.

c) Water user groups should be encouraged to come forward to take some of the responsibilities of state machineries, especially in development, operation and maintenance of canal and distribution systems.

d) Implementation of inter-sectoral and regional allocation of water should be carried out judiciously and in a transparent manner so as to entail greater stakeholder participation, besides encouraging limited private participation.

e) The overall frame of project functioning should be attuned for stakeholder inclusiveness through a collaborative process so as to impart responsiveness and efficacy to its stakeholder interactions at each division of organizational structure and for every aspect of project functioning. Appropriate actions should be initiated for avoiding 'stakeholder turned-off' situations while enhancing stakeholders' trust.

10. In order to strengthen the central-role, water should be explicitly listed in the concurrent-list of the constitution. Besides, the roles of central government, state government, and project management should be restructured in the following manner:

    a) The central government should formulate and implement the 'integrated water plans'. It should also closely monitor the implementation of approved 'state water plans'.

b) Planning and construction of storages on all major inter-state rivers should be done by the central government. However, distribution of water below off-take points of such national projects should be the responsibility of the concerned state.

c) The water resources confined to boundaries of states should be developed and managed by state governments, but with greater involvement of local people.

d) To serve as technical and information base for updating future water allocations, a national registry of water users should be created to help monitor the implementation of evolved plans and to gauge its effectiveness.

e) The allocation of water to states should be regulated to penalise for their levels of pollution-additions to inter-state rivers.

f) For encouraging demand management by states and its regional / sectoral sub-domains, surpluses – over and above allocated share - should be made tradable.