Chapter–4: Stakeholder Model for Water Resource Projects

- *"The test of our progress is not whether we add more to the abundance of those who have much; it is whether we provide enough for those who have little."*
(Franklin Delano Roosevelt)

- *"When the well is dry, we know the worth of water."*
(Benjamin Franklin)

STAKEHOLDER MODEL FOR WATER RESOURCE PROJECTS

While providing a managerial perspective of the water crisis, the previous chapter has covered crucial issues of conception, construction and operation of water resource projects in India; and an in-depth examination of such issues has indicated that 'stakeholder paradigm' is central to the overall managerial dilemma. With a view to portray this paradigm, the present chapter attempts to develop a conceptual framework to gauge the stakeholders of water resource projects. Needless to mention that stakeholder model is sufficiently well developed in the context of market economies, yet with the too evident "moral hazards" under prevailing imperfections of the market, it is incompatible for water resource projects. Besides defining and understanding the stakeholders of water resource projects, the chapter hence also highlights differences in the nature of such stakeholders vis-à-vis stakeholders of business enterprises. The chapter then identifies and classifies the varied stakeholders into appropriate stakeholder groups. Finally, the chapter evolves an apposite stakeholder model for the water resource projects, thereby providing the much needed framework for understanding and navigating complex stakeholder issues.

1 DEFINING THE WATER RESOURCE PROJECT STAKEHOLDERS

The stakeholders of water resource projects can be defined as individuals or group of entities, which may be affected by the water resource project during its conception, construction and operation; and who in turn may also influence the future course of the project. Human as well as non-human entities are called stakeholders of a water resource project if quality of their existence is affected by the construction, and/or operation of the

project. Even non-living entities, such as topographical or archaeological elements of an affected place, can become stakeholders of the project because of their silent capacity to arouse human action.

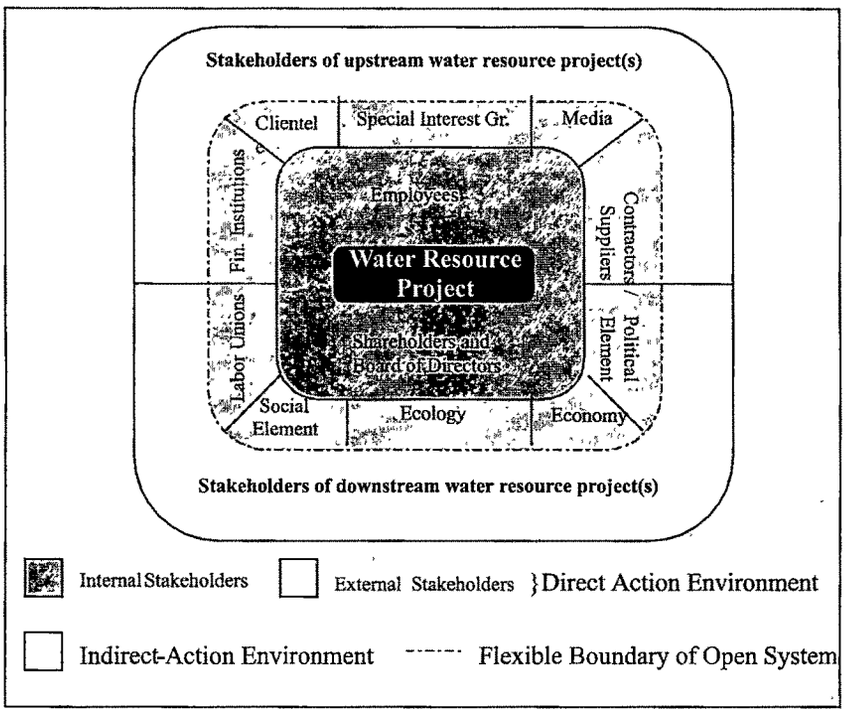
The effect of project on the quality of existence of stakeholders may be limited to the dimension of economic rejuvenation or regression; or may have other dimensions such as affecting stakeholders' natural habitat, or their social and cultural milieu; and in some cases may even jeopardise the very existence of entities. On some of the entities consequences may be visible during or immediately after the commencement of project construction, while on others, the effect may become visible only after considerably long time. The comparative measure of the stakes will also depend upon varying perceptions of different stakeholders. However, the degree of return influence may not be in proportion to the measure of stakes involved, owing to dissimilarity in stakeholders' capabilities in bringing a tangible or intangible influence on project activities.

Similar to the case of business enterprises, the stakeholders of water resource project encompass all internal constituents of the project organization (e.g. shareholders, board of directors, employees, etc.) besides incorporating selective elements of the external environment. Evidently, the external environment of the project consists of both direct-action and indirect-action elements, of which only the direct-action elements form the part of stakeholders group. Similar to the corporate case, the clienteles, contractors, suppliers, financers, labour unions, special interest groups, media, etc. constitute the direct-action elements of project's environment. Besides - and unlike the case of normal business organizations - the social, ecological, economical, and political elements are

almost always a part of the direct action environment, and hence stakeholders of water resource project.

The Figure 4.1 illustrates all such stakeholder elements that constitute the internal and external environment of the water resource project.

Figure 4.1: Internal and External Environment of Water Resource Project



As seen in case of business environment there are elements of indirect-action as well; which at times may resort to direct actions, and hence can be considered as project stakeholders. For example, stakeholders of another project situated upstream or downstream of the concerned project may constitute the indirect-action environment; but such elements have potential to bring direct action on the concerned project thus becoming stakeholders of the concerned project as well (Figure 4.1). The direct actions by stakeholders of a different project may come in two ways: (i) for reasons such as

interstate agreements, river dispute tribunal's award, or judicial directions, the planning and operational aspects of the upstream / downstream project may get amalgamated with those of concerned project; and (ii) the upstream / downstream project may create such conditions to which the concerned project will have to respond and adjust. In the first instance, the upstream / downstream project may even become a co-sharer of benefits and costs of the concerned project with representation in its management and control boards. In the second instance, an upstream project may bring influence on the concerned project by enforcing alterations in its downstream flows; while influences brought by a downstream project may acquire forms of political and legal overtones.

2 DIFFERENCES WITH BUSINESS ENTERPRISES

Mahabharata, the great Indian epic, defines water as gift of nature to all species of globe having four qualities, viz., having no smell (*gandhastatra na vidyate*); energy (*teja*); touch (*sparsa*) and beauty (*rupa*). (*Mahabharata*, 6.8.20). Looking solely from the human perspective, it is generally considered as 'social goods' having significant spillover benefits or costs (Gleick, 2002). Availability of clean and affordable water to one individual means its improved availability to all individuals, who share the water supply system (spillover benefits). Activities of collection, storage, treatment and distribution of water have spillover costs, as they often require common facilities that exhibit economies of scale due to lower average costs. Water is essential for life and health, and also has cultural and religious significance, especially in India where rivers are considered sacred.

2.1 Water Resource Projects are Not Profit-oriented Businesses

For economic growth India is largely dependent on agriculture, for which water is the most essential input, and the government bodies alone regulate the water resource projects. These projects are essentially constructed and operated with the intention of bringing economic and social developments in certain areas or to certain set of people, rather than imparting profits to the owners of the projects. Thus, construction or subsequent operation of water resource projects cannot be construed as profit oriented, rather it is for maximization of social welfare.

Often, with a view to emphasise efficiency in use of water, economic tools and principles are applied on water, but with sub-optimal results. The International Conference on Water and Environment (1992) held at Dublin concluded that water has an economic value in all its competing uses and should be recognized as an economic good. The application of this concept of treating water as an economic good will mean that a given amount of water shall be allocated across competing uses, in such a way, that maximises the net value of water resource. But, this approach cannot be applied in mathematical sense because there are several benefits of water that would defy economic measurement. For example, the need of river flows for religious sanctity cannot be covered under this approach; nor can be covered the ecological requirement which is estimated to be 20 to 50 percent of the total water available worldwide (*Down to Earth*, October 31, 2003). Thus, despite the economic elements being present in water, it may not be fully definable as 'economic good'. Though, to a limited extent –as in the case of bottled mineral water, usually consumed by upper income group people - water may be treated as a commodity, and thus subjected to the market forces.

Water may have economic value, but it also has social, cultural and ecological values that cannot be entirely realised and taken care of by market forces. Even then, treating water somewhat as economic goods full or partial privatisation of water supply projects are possible; and are even being resorted to in some parts of the world. But, such efforts are fraught with heavy risks to both environment and humans because, besides ignoring the needs of ecosystem, the business-people may eventually tend to overlook water as basic needs of mankind, especially the poor. In India, the incidence of poverty[1] has declined from 51.5% in 1972-73 to 19% in 1993-94 (TERI, 1998); but it is still very high in comparison to worldly trends. The poor from a capitalistic viewpoint are typically seen as constituting the 'biotic pressure' and perceived as a threat to country's land, forest, and water resources. Evidently, the poverty drives vulnerable populations to short-term survival strategies that take a heavy toll on the country's stock of natural resources. On the other hand, it is the poor who suffer the impacts of environmental depletion the most. There is a higher dependence of poor on common pool resources, depletion of which hits their incomes very hard. And, even amongst the poor it is the women and children who are subjected to a greater water-related hardship.

Water resource projects in India are taken up with huge investments. Commencing from the first plan and up-till the end of eighth plan the country has incurred an expenditure of over Rs. 91,943 crore on various minor, medium, and major projects (Table 4.1); only to harness about 65% of the ultimate water resource potential, of which about 16% was available from the pre-plan period[2]. At constant prices of 1996-97 level, this stated expenditure translates into a mammoth sum of over Rs. 2,31,386 crore (Table 4.1). Considering such enormity of investment and the fact that natural constraints like topography, geology, hydrology etc. may not allow for splitting-up of a project into

smaller-investment components, the water resource projects are not suitable for private participation. Besides, water supply projects as hitherto envisaged and implemented in public domain are not always financially viable[3] and may not be attractive for private sector participation. Further, due to the social and political implications of such projects, the community level efforts are being resorted, to instead of privatisation.

Table 4.1: Investment (Rs. Crore) on Water Resource Projects

Plan	Major/ Medium Irrigation.	Minor Irrigation	Command Area Development	Flood control	Total
First (1951-56)	376.24 (7803.42)	65.62 (1360.99)	-	13.21 (273.98)	455.07 (9438.39)
Second (1956-61)	380 (6013.98)	161.58 (2557.21)	-	48.06 (760.61)	589.64 (9331.80)
Third (1961-66)	576 (6674.84)	443.10 (5134 76)	-	82.09 (551.28)	1101.19 (12760.88)
Annual (1966-69)	429.81 (3943.90)	560.93 (5147.06)	-	41.96 (585.02)	1032.70 (9475.98)
Fourth (1969-74)	1242.30 (7976.41)	1173.34 (7532.64)	-	162.04 (1040.40)	2577.48 (16549.18)
Fifth (1974-78)	2516.18 (12519.42)	1409.58 (7013.41)	-	298.61 (1485.75)	4224.36 (21018.59)
Annual (1978-80)	2078.58 (7949.67)	981.90 (1388.16)	362.96 (1388.16)	329.96 (1261.95)	3753.40 (14355.15)
Sixth (1980-85)	7368.83 (19625.50)	3416.82 (5100.06)	743.05 (1978.97)	786.85 (2095.63)	12315.55 (32800.16)
Seventh (1985-90)	11107.29 (21207.15)	6179.30 (11798.14)	1447.50 (2762.85)	941.58 (1797.76)	19675.67 (37566.77)
Annual (1990-92)	5459.15 (8125.60)	3030.07 (4510.07)	619.45 (922 01)	460.64 (685.63)	9569.31 (14243.32)
Eighth (1992-97)	2107.87 (31057.63)	11739.36 (17302.52)	2145.92 (3162.85)	1961.68 (2493.35)	36648.83 (54016.36)
Total up to end of 8th Plan	**52606.25 (132389.93)**	**29161.60 (73388.66)**	**5418.88 (13385.66)**	**4856.67 (12222.39)**	**91943.40 (231386.59)**

Note: Amount in parenthesis( ) are at constant prices of 1996-97 level.
(Source: NCIWRD, 1999. Table 4.1, P. 78)

2.2 Intense Effects of Water Resource Projects

Compared to a normal business organisation, water resource project brings about far more intense social, economical and environmental changes and political pay-offs. These changes, with negative (to some) as well as positive (to others) consequences, span over

much larger areas and affect much larger population of stakeholders. Since the project impacts are territorially linked - affects every individual within the project's command – the stakeholder size also continues to grow because of increasing population[4]. From human stakeholders' point-of-view, generally the number of beneficiary stakeholders surpasses the number of adversely affected stakeholders, yet such resemblance in assessment of beneficiary and adversely affected stakeholders may not hold good for non-human stakeholders, or for the total stakeholders' spectrum.

Compared to commercial organizations, changes brought about by water resource projects are prolonged, and remain dynamic. The duration of changes may range from few years to several decades affecting different sets of entities at different points of time, and may even affect the same entities differently at different time spans. For instance, in initial years of construction project may submerge several thousand hectares of land, affecting a large set of stakeholders (people, flora and fauna) adversely. Decades later, it may affect a larger but different set of stakeholders beneficially, by providing them the much needed water. Sometimes, with prolonged use of irrigation in excessive ways the beneficiary areas may get waterlogged, causing adverse affects. The scale of affect on the non-living entities - such as geology, topology, or atmosphere - may vary from small to large, and some of these effects may bring permanent and irrevocable environmental changes.

2.3 Passionate Stakeholders' Influence on Water Resource Projects

Water resource projects also differ in terms of passionate and strong influences brought on to it by stakeholders. The non-human entities - though severely and extensively affected - cannot speak for themselves, and their concerns are voiced by the environment-responsive human groups. Weak voice can also be the case of human beings, where

social-responsive groups step in. Besides, the activism of different sets of people varies considerably over the time. Project oustees who are hyperactive during construction stage of the project may cease to be active during its operational stage, while people at the tail end of command may not show any concern during construction or initial stages, but may become most vocal at operational stage. Because of the larger time span and possibilities for change in the scope of the project, people originally classified as affected may not actually get affected; while others, not originally in the spectrum of benefits or loss, may eventually get affected by the project. The time related attitudinal change is also possible for other reasons; for instance, the people adversely affected by submergence of their land may later get rehabilitated in command areas, thereby making them beneficiaries of the project.

The business enterprises are to a large extent padded from direct public, or political pressures. The roles such (external) stakeholders play are generally demanding in nature, while the management plays a reactive role after careful examination of stakeholders' demands vis-à-vis organisation's immediate objectives and long drawn mission. In contrast to this, the management of a water resource project is open to direct public influence - generally brought through a capricious political response for want of clientele effect - allowing for prejudicial dilution of project objectives and mission. Since many people are affected by even small-scale changes in the scope of projects, the political forces play very vital role in influencing such decisions. These decisions with larger political ramifications, apart from significant financial and economic outcomes, heighten the role played by politically active interest groups, exacerbated by media to a much larger proportion.

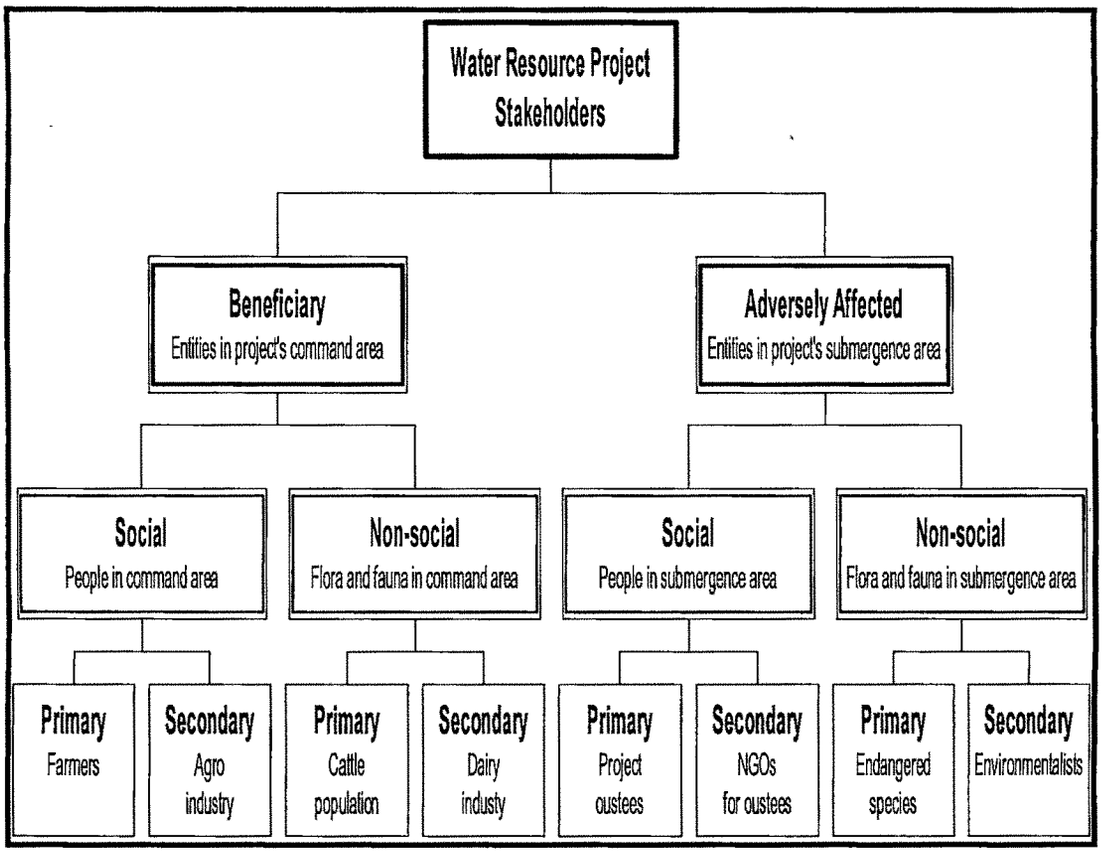
3 IDENTIFICATION AND CLASSIFICATION OF STAKEHOLDERS

The stakeholders of business concerns are identified under two broad categories, viz., internal and external, because of the highly competitive environment in which internal stakeholders present a monolith front to counter the challenges posed by numerous divergent external stakeholders. But, this approach is highly unsuitable for identifying stakeholders of water resource projects for the reason that the internal stakeholders are generally a part of the government (as policy makers, planners or project executors) and their existence is not critically linked with successes of the project. A plethora of departments and ministries may not present a monolith front (especially in case of multi-state projects) for reasons of well established principles of accountability, and thus the notion of internal stakeholders may not be as crucial as in case of business organisations. Moreover, identifying the large and influential segment of external environment as mere external-stakeholders may reduce the significance of some of the diverse, but consequential, stakeholder groups.

What are the other ways of identifying stakeholders of water resource projects? One of the approaches could be the biological and physical differentiation of stakeholders along the lines of living and non-living, human and non-human, urban and rural, etc. Identification approach can also be thought of in terms of project outcomes on the stakeholders with economic, social, cultural, or environmental dimensions. Yet another approach to identification is possible according to the timing of impact (i.e. immediate or later), extent of impact (severe vs. marginal), or stakeholders' capacity to voice response to changes caused by project. Apparently, no single approach for identifying stakeholders of water resource projects is capable of permitting full understanding of the issues and influences by and on project construction and operation; and hence a three-tier approach

is proposed. The Figure 4.2 illustrates the above mentioned three-tier identification approach.

Figure 4.2: Three-tier Stakeholder Identification Process



To begin with, stakeholders may be identified as beneficiaries and adversely affected groups. This division, though comprehensive in terms of nature of project's effect on stakeholders, is too broad and leaves out the inherent characteristics of stakeholders and their capacity to respond to the project effects. Hence the beneficiary and adversely affected stakeholder groups need further sub-classification as social and non-social groups, depending upon presence or absence of social relationship between stakeholders and the project. People affected by the project are social stakeholders because their interests are linked with the project through social intercourse; on the other hand, the affected natural elements, non-human species, and the future human generation - unable

to forge social relationship with project - are the examples of non-social stakeholders (Wheeler and Sillanpaa, 1997). Thus the second tier of identification process leads to classification of stakeholders as (i) social beneficiary group, (ii) non-social beneficiary group, (iii) social adversely affected group, and (iv) non-social adversely affected group.

So far, the identification has been confined to stakeholders who are directly affected by the project. Project effects on indirect stakeholders arise due to their proximity - resulting from social, environmental or economic ties - with the directly affected groups; and they also bring influences on the project. The directly and indirectly affected stakeholders are classified as primary and secondary sub-groups respectively. The third tier of identification process thus leads to an eight-fold classification of stakeholders in (i) primary social beneficiary group, (ii) secondary social beneficiary group, (iii) primary non-social beneficiary group, (iv) secondary non-social beneficiary group (v) primary social adversely affected group, (vi) secondary social adversely affected group, (vii) primary non-social adversely affected group, and (viii) secondary non-social adversely affected group.

Besides delineating unique properties of each group, the suggested approach also enables to generate class-specific information and design managerial strategy for a meaningful response. Thus identified stakeholder categories represent diverse interest groups, though in some cases the demarcation may not necessarily be watertight. Nevertheless, in majority of cases, the identified key-categories of stakeholders have distinct attributes, which are briefly discussed below.

3.1 Primary Social Beneficiary (PSB) Stakeholders

The people who are directly benefited by the supplies of water form the project constitute this stakeholder group. With the command of the project extending over vast areas, millions of farmers become primary social beneficiaries of the project. In water scarce areas, the cost of water from alternative sources is often prohibitive for the poorer farmers, while the tariff for irrigation water from projects is kept low so that all segments of the society are benefited from it. Compared to the groundwater irrigation development of about 72% (of the ultimate potential), the surface water development through major / medium projects and minor projects have been 56% and 70% respectively (Table 4.2). Although the share of groundwater in net irrigated area has risen[5] from a third in 1965-66 to over half at present (Saleth, 1996), yet in places where groundwater has been in prolonged use the investment and recurring cost of pumping out water from the continuously depleting groundwater reserves is affecting the poorer farmers more. The water resource projects thus bring immense relief to the economically challenged farmers, besides helping every farmer of the command in increasing rotation of crops and also in getting more yields per rotation; thus bringing them economic prosperity.

Table 4.2: The Surface and Ground Water Irrigation Development in India

Particulars	Ultimate Potential (million hectare)	Irrigation developed at the end of 8th Plan (1996-97) (million hectare)	Developed Irrigation as Percentage of Ultimate Potential*
Major & Medium Irrigation	58 46	32.69	55.9%
Minor Surface-water Irrigation	17 38	12 25	70.5%
Ground water Irrigation	64.05	45 88	71.6%
Grand Total	139.89	90.82	64.9%

* Ultimate Potential: 139.89 Million hectares

(Source: NCIWRD, 1999. Table 4.5, P.88)

The drinking water situation in India has improved largely on account of the groundwater resource, which forms four-fifths of the domestic water supply in rural areas and around half that of urban and industrial uses (Shah, 1993), and balance is met from surface water

resources. However, the groundwater dependent areas have not been able to improve upon sanitation facilities[6], and such facilities continues to be non-existent for most parts of rural areas and more than half of urban areas (see Table 4.3). Thus rural areas for sanitation improvements and urban areas for both drinking water and sanitations depend upon surface water projects.

Table 4.3: Development of Drinking Water and Sanitation Facilities

Category	Percentage of Population		
	1985	1990	1996
Drinking water supply			
Rural	56.3%	73.9%	82.0%
Urban	72.9%	83.8%	85.0%
Sanitation facilities			
Rural	0.7%	2.4%	4.6%
Urban	28.4%	45.9%	50.0%

(Source: Economic Survey, 1996-97)

Yet another set of people, who are directly associated with construction, operation and maintenance of water resource projects - representing disciplines like engineering, revenue, geology, survey, public health, agriculture, quality control, accounts, vigilance, general administration etc., and forming a mix of technocrats and bureaucrats – also constitute the PSB stakeholders. The people in this group have significant stakes, such as: deriving job-satisfaction, status, career progression, and certain perks. Because of the large scope of construction and maintenance works, several contractors and supply agencies associated with the project are also part of the PSB stakeholders.

State governments, being owners of the water resource projects, are primary social beneficiary stakeholders. In case of multi-state projects, the governments of other beneficiary states also become part of PSB stakeholder group. The huge financial requirement brings in the central government, developmental agencies (IMF, World

Bank, UNDP etc.) and other financial institutions (ICICI, IDBI, Power Finance Corporation, etc.), which agree to provide or help raise funds. Because of their financial stakes, they also form a part of the PSB stakeholders' group.

3.2 Secondary Social Beneficiary (SSB) Stakeholders

Those people, who are indirectly concerned with the benefits of construction and operation of the water resource projects, belong to the SSB stakeholder class. Agricultural growth also spurs economic prosperity of farm-labourers, crafts men and traders, besides encouraging agro-product industries, within and outside the command areas of the project. Thus, Punjab today is a substantial importer of labour from the poorest states of India; and the benefits of the agricultural prosperity of Punjab are widespread apart form making the country self-sufficient in food production. Growth of cities in the command, and commercial activities like tourism also flourish with upcoming of water resource projects. Water resource projects usually come up in remote and economically backward regions; and give tremendous boost to the infrastructure development of that area, bringing large-scale economic development.

Being large-scale infrastructure projects involving heavy investment of money, such projects have huge capacities to generate demand for construction-material (cement, steel, chemicals etc.); equipment (excavators, bulldozers, hoists, cranes, concrete mixers, pavers, generators, pumps, drilling equipment etc.); fabricators; bankers; consultants; designers; and other support services. Because of project's potential to give employment to millions of people and opportunities to thousands of entrepreneurs, people affiliated to labour unions and political parties (with capacity to influence manpower recruitment and works/supply contracts) also get interested. Often technology and equipment are imported

from developed countries and the governments of such countries also show interests in these projects. All these entities constitute the group of SSB stakeholders.

Infrastructure projects undoubtedly affect a nation's economic growth, which is indicated by the quantitative economic change, usually measured as increase in per capita income or output. Investment in water resource projects is intended not only for present consumption, but also for production of other goods through agriculture (e.g. food and non-food crops, and several agro-products) and power (whole industrial sector); and hence is a factor of output growth. Since in developing countries, progress in the agricultural sector is a precondition for stimulating growth in the modern sector[7], the water resource projects play a very vital role in the economic development of India.

Thus, the central government; its numerous ministries, departments, and institutions; and Planning Commission, advocate the cause of water resource project. The NGOs working for upliftment of rural populace, social and cultural welfare societies, agricultural and dairy promotional agencies, public health departments, the national level industrial and trade bodies etc. also express interest in successful completion of the water resource projects. These advocates of water resource projects also form part of SSB stakeholders.

3.3 Primary Non-social Beneficiary (PNB) Stakeholders

The ecology of area that is fed with water from the projects gets immensely benefited. The irrigation water not only brings greenery to the farmers' fields but also enhances the vegetation cover over the whole terrain. As is seen from past experiences (e.g. Indira Gandhi Canal Project in Rajasthan), most of the time the project turns an otherwise barren land into a land full of crops, cattle fodder, and fruit-bearing and woody trees. Besides

flora, irrigation projects also benefit the fauna in command areas. Many kinds of insects, reptiles and birds, not only get the conducive environment, but also contribute towards development of food chain, which is basic for their natural existence. Cattle population, wild life, and bird sanctuaries are benefited by the newly augmented supply of water and fodder in command areas. All such entities of command area constitute the PNB stakeholder group. With the benefits accruing in command areas, the economic and social life styles of people may go through a sea change, bringing definite impact on their children. Thus, future generation of command areas are also a part of PNB stakeholders.

Since command areas extend from few thousand hectares to few million hectares, the increase in green cover of such vast areas improves the ambient conditions and localised rainfall pattern, besides contributing in reduction of the global warming. There are some positive effects on the river ecology also, such as reduction in frequency and intensity of floods leading to relief from recurring washout of fertile soil and vegetation cover of downstream flood planes. By tapping significant amounts of river silt, the projects also help in providing cleaner water to the downstream reaches of the project. The abundance of water for most part of the year may help growth of forest cover, which in turn may influence the rainfall pattern of the area and also improve groundwater penetration of the rainfall, thereby increasing the base flows of the river. The dense forest cover along reservoir fringes also provides protection against erosion, floods, and denudations, besides improving the wild life and also causing growth of aquatic lives in project reservoir. All such entities outside the command may also constitute the PNB stakeholder group.

3.4 Secondary Non- social Beneficiary (SNB) Stakeholders

Because of improvement in the conditions of cattle population, the dairies and affiliated industries in command areas get immensely benefited, thereby making them SNB stakeholders. The forests in India constitute only 19.25% of the geographical area as against 33% aim enunciated under National Forest Policy[8] (NCIWRD, 1999). The water resource projects - with their targets of compensatory afforestation over an area three times (or more) than that of submerged forest areas – help in enhancing this low forest-cover-ratio. The organizations responsible for the compensatory afforestation programmes of the project, along with those associated with reserve forests, wild life sanctuaries, bird sanctuaries, etc. in the command areas, also constitute the SNB Stakeholder group.

Though the state government responsible for formulation of water resource projects generally takes into account the ecological and environmental benefits, yet many of the central government agencies, non-governmental organisations, and some times institutional financers, also exert influences to enhance project benefits to the non-social entities. All such entities also fall under the SNB stakeholder class.

3.5 Primary Social Adversely-affected (PSA) Stakeholders

Spread over vast geographical areas, the people displaced by project submergence are the main constituent of the primary social adversely affected stakeholders. Being affected at a very early stage of the project, they try their best to stall the project; and often succeed as well. Statistically, rural areas seem to be more prone, though instances of urban and semi-urban areas coming under reservoir submergence are also not uncommon.

Sometimes, full villages go in submergence leading to whole-scale displacement of people, generally to distant locations. In such a case the social fabric of villages may be recreated with careful planning and execution. In another case only part of the villages may get affected, but it may be possible to accommodate displaced people within the vicinity of such villages. However, the most common case is that of the partly affected villages, where affected people are resettled in far-off places due to non-availability of sufficient land; and in such situations the social balance of villages gets disturbed, threatening their sustainability.

From economic viewpoint, some of the project affected people may loose whole of their agricultural land and also their dwellings; some may loose only the land or part of it but not the house; some may loose only house but not the land. Those who are affected significantly have no option against displacement; but may retain or even surpass their earlier social and economic status, if properly compensated. Ironically, marginally affected people may not like to leave their native place; but may suffer long-term economic losses and fall in social status, despite reasonable cash compensation for lost lands. Sometimes people get affected adversely even without loosing land properties, as may happen in cases of land-less farm labourers, boat-men, traditional craftsmen, carpenters, blacksmiths, shoemakers, tailors etc, whose means of livelihood gets affected due to large-scale displacement of village population.

For large-scale resettlement of project oustees, the Government is often required to procure land from villages which are otherwise unaffected by project. This may create a secondary layer of displaced people who are also directly affected by the project. Some times a portion of forestland or other state owned land is utilised for resettlement of

project affected people, thereby adversely affecting another set of people who are dependent on the forest produce or have encroached the government land for cultivation. All of the above-discussed people constitute the PSA stakeholder group.

With commencement of project operations, fishermen along the downstream river stretch may get adversely affected due to reduction in stream flows. The farmers along the downstream riverbanks may also get affected due to shortage of irrigation waters, apart from loss of fertility of lands in absence of top-dressing (with sediments and nutrients) by the annual floods. The economy of religious and tourist places along the downstream riverbanks will also get affected as these places loose eminence due to degradation of the river. Industries in the vicinity of rivers too get affected due to reduction in stream flows; and if continued unabated, the increased concentration of pollution also affects the people along downstream river stretches. All such adversely affected people are also categorized as PSA stakeholders

3.6 Secondary Social Adversely-affected (SSA) Stakeholders

The secondary social adversely affected stakeholders are indirectly concerned with the adverse affect of project. This group may include people who are emotionally aggrieved by the displacement of near and dear ones, though they are not displaced. Similarly in case of partially affected villages, the people left out from displacement may suffer social, cultural and economic deprivations; and not being treated as project affected, they may not get compensated for the loss.

The SSA stakeholders also involve individuals or organisations who themselves are not affected, but voice concern for those subjected to large-scale displacement and hardships.

They unite the segmented group of oustees who are not only dispersed but belong to diverse social, cultural, and economic strata. They educate the oustees, who are mostly illiterate, about their own rights in the democratic set-up. They provide oustees with financial and material support for commencing and sustaining agitations against the projects. On behalf of seemingly failing oustees, they also file legal suits against the projects; and thus provide judicial opportunities to displaced people, while creating active canvass for themselves.

Many a times, such groups with high-tech resources like large databank, audio-video documentation, web-sites etc., not only awaken the media, political parties, and the general public, but also create significant hurdles in way of project funding by bringing influences on the funding foreign governments, and international financiers like World Bank, IMF etc. They often oppose water resource project in its entire dimensions, and fail to see any possible advantages from it. With this sole objective of opposing the project, they often refuse negotiated settlements, thereby sometimes jeopardising the best interests of the oustees. Remaining in the shadows of leading personalities of these (secondary) stakeholders, the directly affected people may sometimes find their real issues and voices muffled altogether.

There are also cases of SSA stakeholders' entities that work in collaboration with project authorities for resettlement and rehabilitation of project oustees. Since the project-displaced people are often not a part of mainstream society, they are left vulnerable when officials with little competency in handling their affairs try to mediate. In such cases, presence of secondary stakeholders (with knowledge of local dialect and familiarity of culture) considerably helps in mitigating the hardships of project oustees, provided that

public services competently engage them in community mobilization instead of purely using a top-down approach.

3.7 Primary Non-social Adversely-affected (PNA) Stakeholders

The flooding of large river valley areas by project reservoirs, along with the project construction activities involving laying of roads, power lines etc. lead to fragmentation and destruction of forests. The deforestation (especially of tropical forests) caused by the water resource projects is considered as one of the gravest environmental concern world over. Between 50 to 90 percent of all the earth's species are believed to be living in tropical rainforests, which covers less than six percent of the total land area.

It is estimated that project reservoirs have traditionally caused about 10% of total annual deforestation in the tropics, thereby posing a great threat to biological diversity with the possibility of total extinction of some of the genes, species and ecosystems (FIVAS, 1996). Though, it is difficult to predict the consequences of loss of such life forms, it is generally believed that the loss will prove a serious threat to our biosphere. Besides, forests control the earth's climate, and deforestation may change the global hydrological cycle, the distribution of heat and rainfall, and the chemical composition of the atmosphere. Thus the forest ecology affected by project construction constitutes the PNA stakeholder entity.

The nomadic tribes of hunters and gatherers - who are the indigenous people of forests with immense traditional knowledge of herbs, fruits, spices and medicinal plants, even unknown to modern science - often fail to establish any social relationship with the

outside world. This set of people, affected along with the flora and fauna of forest undergoing submergence, also fall in the PNA stakeholder group.

Many ancient monuments, religious places and archaeological sites may also go under submergence. Artificially created submergences are also known to induce seismicity[9] in and around reservoir areas. Numerous adverse ecological effects are also felt in the area downstream of project reservoir – due to changes in the channel and flow characteristics of the river - with major impact falling on aquatic lives[10]. Changes in the riverbed grade due to increased bed erosion are also possible owing to reduction in the river silt load. Sustained reduction in river flow may also cause salt intrusion in the estuarine and lower river basin areas.

If not compensated by extension of project command, the groundwater levels in areas downstream of the project may also fall noticeably. The changes brought about by reduction in flows may also affect the wildlife and wetland life along downstream riverbanks and impact the biological diversity. These entities, which are consequentially affected by the water resource projects, are also part of the PNA stakeholder group.

3.8 Secondary Non-social Adversely-affected (SNA) Stakeholders

All individuals and organisations showing concern for the damages caused by water resource projects to ecosystem of the planet earth, fall under the category of SNA stakeholder group. This group constitutes a very literate segment of the global society with scientific background in specialised areas of atmosphere, hydrology, geology, ecology, etc. Anthropologists, historians, archaeologists and international media may also some time form constituents of the SNA group. International agencies like UN related

bodies, WWF etc. and financers like World Bank, IMF etc. also sometime voice their concern for the non-social adversely affected entities, and thus become SNA constituents.

The concern of people on the issues of environment, bio-diversity and animal rights etc., has increased world over with advent of information technology; and in this situation, the role of SNA stakeholder group has become vital in influencing the construction and operation of water resource projects. Many of this group are vehement opponents of water resource projects. The arguments and views of these people also often provide intellectual support to the social adversely affected groups.

At times, the secondary groups of social and non-social adversely affected stakeholders, pool up their resources and present a united front against the water resource projects. However, there are also SNA stakeholders that work to help the project authorities in identifying the adversely affected entities and measuring the project impacts on them (e.g. identification of threatened species in submergence area, identification of fault zones for possible reservoir induced seismicity, impact on fishes migrating upstream in search of spawning grounds, etc.). This knowledge sometimes helps project authorities in containing adverse effects by appropriate adaptation of technical measures.

4 STAKEHOLDER MODEL FOR WATER RESOURCE PROJECTS

As alluded above, the stakeholders of water resource projects are of vastly varying types, have complex characteristics, and bring intricate influences on the projects. This necessitates the development of a stakeholder model that will provide the framework for easier understanding of the whole spectrum of stakeholders, imparting efficacy to the management system.

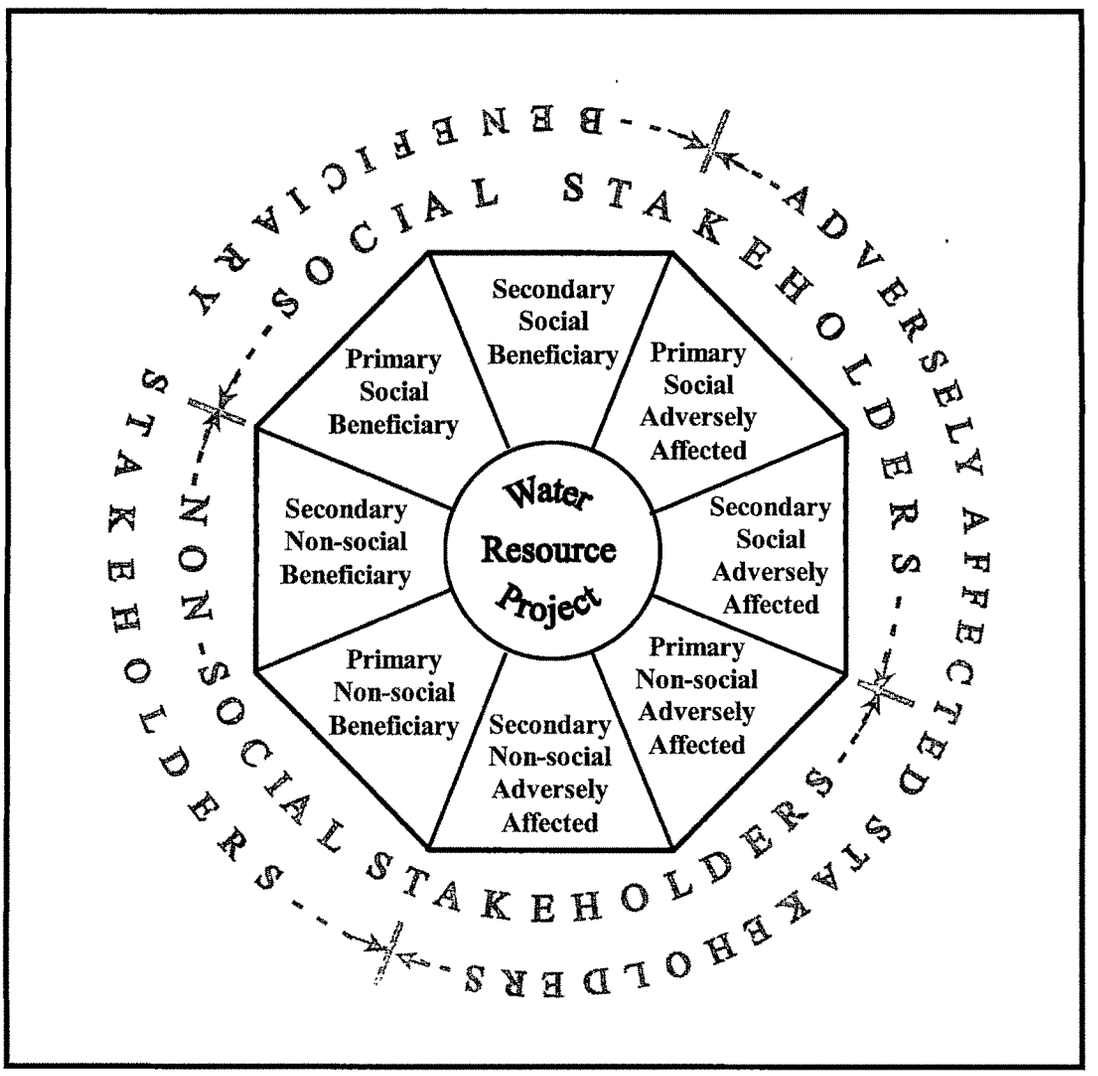
Though the stakeholder model is well developed in the context of market economies, yet the "moral hazards" of the market are too evident under the prevailing imperfections therein (Arrow, 1951). This situation essentially arises owing to the opportunistic tendencies of the human agents, though they may not be continually given to opportunism (Hart, 1961). Nevertheless, increasing regulation is the order of the day in free market economies to ensure welfare by curbing disparities. Perceptibly, the corporate stakeholder model with such inherent limitations of market economies may not provide a sound framework for understanding stakeholder issues of water resource projects coming under public domain. Hence taking resource to the 'contingency theory' – an approach to the study of management problem which assumes that the effects of any managerial practice will differ according to the circumstances in which it is implemented (Lawrence; and Lorsch, 1967) – the alternative stakeholder model contingent to the needs and conditions of water resource projects is proposed.

4.1 The Octagonal Stakeholders' Congregate

The earlier exemplified stakeholder groups can be structured into a model indicating their octagonal congregate of influences on water resource project, as illustrated in Figure 4.3. The model schematically demonstrates the two-way interaction between the project and the stakeholders. The four groups of beneficiary stakeholders (i.e. PNB, SNB, PSB & SSB,) and the four groups of adversely affected stakeholders (i.e. PSA, SSA, PNA & SNA) divide the sphere of stakeholders' influence into two halves, with the cumulative influence of each hemisphere applied in diametrically opposite directions. The adversely affected stakeholders generally react in a manner to negate the scope of the project and retard its progress. Often stirred in initial construction stages of the project, they mostly

react in unison, and become difficult to negotiate. On the other hand, beneficiary stakeholders bring influences to enhance the scope of the project and accelerate its progress. They get activated gradually and at intermittent time spans; but most of them remain aloof or passive during construction and initial stages of the project. Unlike the adversely affected stakeholders' unidirectional approach in opposing the project, the beneficiary stakeholders' interests often clash with each other, presenting a picture of a (large) disjointed interest group.

Figure 4.3: Stakeholder Model Indicating Octagonal Congregate of Stakeholders



The four groups of social stakeholders (i.e. PSB, SSB, PSA & SSA) and four groups of non-social stakeholders (i.e. PNA, SNA, PNB & SNB) also demarcate the sphere of stakeholders' influence into two halves. The directions of influence brought about by social and non-social stakeholder groups need not be having opposite bearings, as this factor will be mainly governed by their perceived beneficiary or adversely affected status. However, the social and non-social stakeholder groups may differ extensively in the manner and intensity of influences brought about by them on the project. Unlike the case of social stakeholders - where primary stakeholders bring major influence - only the secondary stakeholders interact and influence the project in case of non-social stakeholders. Apparently the social segment of the stakeholders has an edge over the non-social stakeholders, in negotiating with the project for their cause. Nonetheless, the importance of non-social stakeholders is being increasingly recognised; and very often the case of the non-social stakeholders are defended by the elite and literate segments of the society, the politically active special interest groups, the judiciary, the media, and many international bodies.

Evidently, the direction of secondary stakeholders' influence is in line with that of its primary counterpart. Importance of secondary non-social stakeholders is understandable; though, in case of water resource projects, secondary social stakeholders also play a very vital role, especially in cases where primary stakeholders are socially and economically backward, and adversely affected by the project. The submergence areas of water resource projects are mostly in hilly areas where population is highly dispersed and the people affected are generally tribal. Some of the more backward tribes among them may in fact be closer to the non-social category. The primary stakeholders from such regions, owing to deprivations suffered due to poverty, illiteracy, ethnicity and geographical diversities,

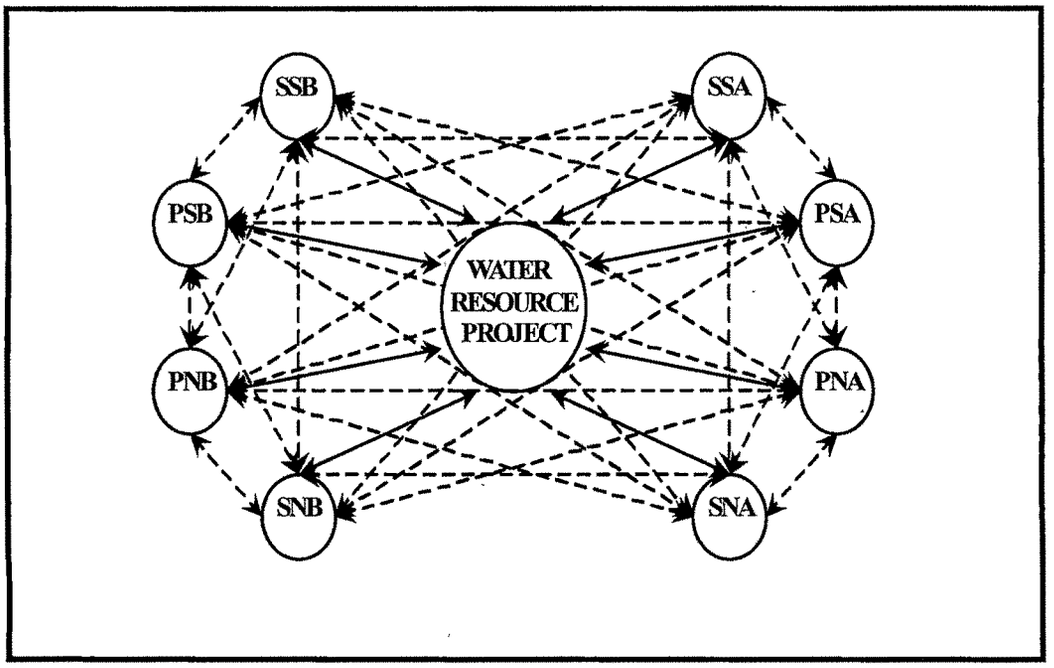
show limited willingness or ability for stakeholder initiatives. The secondary stakeholders representing the cause of such adversely affected people, often voicing concave and convex view of the issues, play considerable role in influencing the projects.

4.2 The Networked Effect of Stakeholders' Influence

The different stakeholder groups bring varying degrees of influence on the project in terms of direction, intensity and the manner of influence. Each of the stakeholder groups may influence other stakeholder groups as well, thereby triggering a change in their influence on the project. While the manner of stakeholders influence remains unchanged, the results of such triggers often lead to a change in intensity, and sometimes a change in direction, of the influence. For example - as in case of Silent Valley Project in Kerala, abandoned in seventies due to intense stakeholders activism - the possible cause of extinction of a particular species (Primary Non-social Adversely affected stakeholders) may influence not only the other adversely affected groups through a collaborative process to intensify opposition to the project, but also exert stress on the beneficiary stakeholders to withdraw support to the project.

The eight identified stakeholder groups of water resource projects thus not only bring influence on the project but also influence other stakeholder groups, creating a network of influences on the project as illustrated in Figure 4.4. The networked effect of stakeholders' influence may sometimes lead to a cascading effect brought by multiple groups of stakeholders, with resonant implications on the project; which if not carefully managed, may lead to reduction in scope of work in the best scenario, or abandonment of project itself in the worst scenario.

Figure 4.4: Network of Stakeholders' Influence



Legend:
SSB: Secondary Social Beneficiary;
PSB: Primary Social Beneficiary;
PNB: Primary Non-social Beneficiary;
SNB. Secondary Non-social Beneficiary;
SSA: Secondary Social Adversely Affected,
PSA: Primary Social Adversely Affected;
PNA. Primary Non-social Adversely Affected,
SNA: Secondary Non-social Adversely Affected

Identification of pattern of collision or collusion in different categories of stakeholders, through understanding of the networked effect, provides identification of pathways for enhanced and improved people oriented accountability for the reasons of ensuring equity and distributional goals. Failure to understand this route jeopardizes the welfare goal and makes bureaucracy and client relationship weak, leading to entrenched political behaviour detrimental to both project and the society.

Notes:

1. India's population below the poverty line has been decreasing over the years as brought out in Table 4.4.

Table 4.4: Indian Population Below Poverty line

Year	Population (in Million) below the poverty line			
	Rural	Urban	Total	As % of total population
1972-73	244.2	47.4	291.6	51.5%
1977-78	253.1	53.7	306.8	48.3%
1983-84	221.5	49.5	271.0	37.4%
1987-88	196.0	41.7	237.7	29.9%
1993-94	141.1	27.5	168.6	19.0%

(Source: TERI, 1998)

However, there is wide spread doubt about the definition and the measure of poverty incidence. For example Lakdawala Committee points out that the decline in poverty rate has been only marginal (from 39.3% to 39%) over the 1987-88 to 1993-94 period (as compared to 29.9% to 19%, shown in Table-1). Another study by ICRIER (Indian Council for Research in International Economic Relations) points out that actually the poverty has risen form 39% in 1991-92 to 41% in 1992-93. The Economic survey 1996-97, also mentions an increase in the incidence of poverty on account of the fall in real rural wages induced by the rise in prices of goods that constitute the rural consumption basket (TERI, 1998).

2. The development of irrigation potential (in Million hectares) under different five-year-plans are given in Table 4.5.

Table 4.5: Development of Irrigation Potential (Cumulative) During Plan Periods

Plan	Under Major / Medium Irrigation Schemes	Under Minor Irrigation Schemes	Total Irrigation Development	Development as % of the Ultimate Potential*
Pre - Plan	9.70	12.90	22.60	16.16%
First Plan (1951-56)	12.20	14.06	26.26	18.77%
Second Plan (1956-61)	14.33	14.75	29.08	20.79%
Third Plan (1961-66)	16.57	17.00	33.57	24.00%
Annual Plan (1966-69)	18 10	19.00	37.10	26.52%
Fourth Plan (1969-74)	20 70	23.50	44.20	31.60%
Fifth Plan (1974-78)	24.72	27.30	52.02	37.19%
Annual Plan (1978-80)	26.61	30.00	56.61	40.47%
Sixth Plan (1980-85)	27.70	37.52	65.22	46.62%
Seventh Plan (1985-90)	29.92	46 61	76.53	54 71%
Annual Plan (1990-92)	30.74	50.35	81.09	57 97%
Eighth Plan (1992-97)	32.69	58.13	90.82	64.92%

* Ultimate Potential: 139.89 Million hectares

(Source: NCIWRC, 1999. Table 4.2, P 79)

3. Since 1974-75, water resource projects in the country have been reporting losses (i.e. negative net revenue). At all India level during 1991-92, against the average working expense of Rs.1032 per hectare, the gross receipt was only Rs.82 (Navalawala, 2001).

4. India has not achieved any significant success in stabilizing the growth of its population despite 50 years of independence. Rising from 350 million in 1950-51, India has become a home of 1 billion and 27 million people by 2001 (TERI, 1998; and Census India, 2001).

5. In contrast to the traditional farming technology, modern methods based on high-yielding varieties and chemical fertilizers produce best results under a tight, time-bound, crop-management regime; and therefore, the farmers desire to have a high degree of control over irrigation. Though expensive, groundwater provides the greatest measure of security on all the three fronts sought by the farmers: timeliness, adequacy, and reliability. Studies have shown that even when farmers have access to both surface water and groundwater, they use surface water because it is cheap, and groundwater because they have greater control over it (Shah, 1993). The factors collectively explain the shift in favour of groundwater since the 1960s, which is evident from the increase in the groundwater structures as reflected in Table 4.6.

Table 4.6: India's Groundwater Resource Development

Year	Dug Wells (Millions)	Private shallow Tube-wells (Thousands)	Deep Tube-wells (Thousands)
1947	3.51	1	1.7
1950-51	3.86	3	2 4
1968-69	6.11	360	14.6
1973-74	6.94	1000	22.0
1978-79	7.69	1960	32.6
1984-85	8.74	3360	46.2
1993-94	10.20	5040	69.4
1997	10.92	6020	83.2

(Source: CGWB, 1989; and CWC, 1996)

6. Owing to the water related constraints, the toilet facilities are available only to a small proportion of the urban population. This lack of proper sanitation facilities is a serious intrusion on individual privacy, and is also believed to be cause of serious abdominal disorder amongst women.

7. A surplus of agricultural products from the rural sector is needed to feed the expanding urban population and sustain the growth of the industrial sector. Moreover, the growth in agricultural productivity releases rural workers to move to the urban areas as industrial labour. Agricultural productivity improvement raises rural income and living standards. Finally, agricultural products have export potential, earnings from which can be used to pay foreign debt and to import needed consumption and investment goods (Hess Peter and Ross Clark, 1997).

8. In the National Forest Policy of 1952, a high 60% cover for forests is stipulated for mountain areas, while owing to population pressure, the stipulation is only for 20% forest cover in the plains. Presently the forests are spread over an area of about 63.34 million hectares against India's total geographical area of 329 million hectares (NCIWRD, 1999). The most densely forested areas lie in the Andaman Islands (about 90%), followed by Jammu and Kashmir (about 61.4%), Madhya Pradesh (about 33.1%), Assam (about 29.9%), and Kerala (about 27.4%) (CBIP, 1998).

9. It is important to note that the situations caused by reservoir alone are not sufficient to cause failure in rock-mass to generate earthquakes. However, presence of a prestressed fault in the region may become a sufficient cause for triggering of the earthquakes. Since all the conditions are not met in most cases, the number of reservoir induced seismicity are negligible compared to total number of reservoirs in the world.

10. The aquatic life in the riverine, estuarine and even marine area is affected on account of reduction of river flows, because of blocking up of fish migration to upstream river reaches, loss of nutrients, and increase in turbidity and pollutant contents of water. The estuary - where fresh water meets the sea - has a rich ecosystem and is affected most by the reduced river flows.

References:

1. Arrow, Kenneth J. (1951). *Social Choice and Individual Values*. New York: Wiley.

2. CBIP (Central Board of Irrigation and Power) (1998). *Publication No. 272: Typical Dams in India*. New Delhi: Central Board of Irrigation and Power.

3. Census India (2001). *Census figures by Registrar General, India*. Download from http://www.censusindia.net on 21.12.2003.

4. CGWB (Central Ground Water Board) (1989). *Hydrogeological Map of India*. New Delhi: Government of India, Central Ground Water Board.

5. CWC (Central Water Commission) (1996). *Water and Related Statistics*. New Delhi: Government of India, Central Water Commission.

6. *Economic survey 1996-97*. New Delhi: Government of India, Ministry of Finance.

7. FIVAS (The Association for International Water and Forest Studies) (Jan. 1996). *Report: Power Conflicts*. Download from http://www.solidaritetshuset.org/fivas/pub/power_c, in March 2001.

8. Gleick Peter, H., Wolf Gary, Chalecki Elizabeth, L., Reyes Rachel (2002). *The New Economy of Water*. Pacific Institute, California. Downloaded from http://www.pacinst.org, in February 2002.

9. Hart, H.L.A. (1961). *The Concept of Law*. Oxford: Oxford University Press.

10. Hess Peter, Ross Clark (1997). *Economic Development – Theories, Evidence and Policies*. The Dryden Press.

11. International Conference on Water and Environment. *The Dublin Principles* (Jan.1992). Download from http://www.wmo.ch/web/homs/icwedece.html, in May 2002.

12. Lawrence, P.R.; and Lorsch, J.W. (1967). *Organization and Environment*. Cambridge, MA: Harward Business School.

13. Navalawala, B.N. (2001). "Water Resources Development In India – Shift in Policy Paradigm". 20th Sir Visvesvaraya Memorial Lecture, 24th November 2001. Chennai: Anna University.

14. NCIWRD (National Commission for Integrated Water Resource Development) (1999). *Volume-I of the Report titled "Integrated Water Resource Development Plan – A Plan for Action"*. New Delhi: Ministry of Water Resources, Government of India.

15. Saleth, R.M. (1996). *Water Institutions in India: Economies, Law and Policy*. New Delhi: Commonwealth Publishers.

16. Shah, T. (1993). *Groundwater Markets and Irrigation Development: Political Economy and Practical Policy*. Bombay: Oxford University Press.

17. TERI (1998). *Report: Looking back to think again – Green India 2047*. New Delhi.

18. Wheeler David, Sillanpaa Maria (1997). *The Stakeholder Corporation – a blue print for maximizing stakeholder value.* London: Pitman Publishing.

****