

## **Hydraulic Mission to IWRM:**

### **Paradigm Shifts within water sector development**

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The aim of the session is to develop an analytical framework to understand the developments within the water sector and place issues of equity central in it. The learning objectives are:

1. To clarify the evolution of concepts like Development and Sustainable Development.
2. To trace the evolution of different paradigms within the developments in Water Sector and clarify the concept of Integrated Water Resource Management (IWRM).
3. Tracing the parallels between Sustainable Development and IWRM, understanding the analytical importance of these concepts and placing issues of equity within these debates.

#### A Note on the Reading Material of this Session

The reading material is divided into two parts covering the three learning objectives. The first part traces the different meanings ascribed to development and thus depicts the different strands of development thinking. This is an over simplified version of a long and complex debate on development in the last five decades. It only opens a window to certain important vantage points from which development was defined. It is basically taken from the lecture notes of a full Development Theory Course.

The second section is compiled from Briscoe and Malik (2007), Mollinga (2006) and Allan (2006).

Anybody interested in learning more about a particular theory in the first section or issues discussed in the second section may contact [ncn@saciwaters.org](mailto:ncn@saciwaters.org) OR [ncnarayanan@gmail.com](mailto:ncnarayanan@gmail.com) for further references.

## **Introduction**

A sound water management strategy is an inherent part of development. Being a vital resource for human survival, water development has been closely linked to the historical development of every society. This session will be dealing with the developments in the water sector. However, before going into that, we have to understand the meaning(s) of development. Development has been ascribed different meanings and this is reflected in issues of water management too. Hence we take up the parallel evolution of two concepts, which have become buzz words in the debates on development as well as water management—sustainable development and Integrated Water Resources Management (IWRM). There are strong parallels between these concepts and it is essential to un-pack these for analytical clarity.

Section 1 will examine the evolution of the meanings of development over a period by briefly examining certain major theories that were proposed in the last sixty years. At the end, it will try to develop an analytical frame of sustainable development, which incorporates elements and concerns from all the previous theories. Section 2 will attempt the similar evolution of IWRM in the global debates and examine its scope, limitations and acceptance in the South Asian context.

## **Section 1** **Growth to Sustainable Development – Path Traversed**

Development is a commonly used term. However, the meaning of development has been fervently debated with sustainable development being the latest addition. It is difficult to cover every strand of this wide ranging debate. We are going to discuss how development is being debated in the post second world war period, which also marks the beginning of the post-colonial period. Seven important strands of development thinking that evolved in the period is discussed, not chronologically, but put forward by proponents who perceived development from certain vantage points that was either a criticism of existing theory or put forward to fill in certain gaps unaddressed by the earlier ones in the following order: modernisation, dependency, alternative development, neo-liberalism, human development, post-development and sustainable development.

According to Wolfgang Sachs, even the term ‘underdeveloped’ was coined to describe vast expanses of the world by the American President Truman in 1949 on his speech to assume office. European-American ideas of progress were extended to the erstwhile colonies when a battle loomed between the USA and USSR for the hearts and minds of rest of the world. Newly independent nation states started to on a path to achieve accelerated development. Models of development were prescribed and ready for delivery from two opposing view points—capitalism and socialism. The competition for ideological hegemony was thus between these first and second world leading nations who competed to influence the so-called third world nations with aid and technical assistance for development. In this period, scholars, planners and aid workers subscribed to a conception of development as modernisation and ‘growth’ was the mantra.

## Modernisation

Modernisation theorists held that developed societies were distinguished by their economic, social, cultural and political modernity which contrasted sharply with the traditional values of underdeveloped, developing, backward, third world or ‘late-comer’ societies and development as the transition from traditional to modern society, basically "catching up" by following on the footsteps of and emulating the West (US). The transition meant was from ascribed status, hierarchy and personalized social relations in traditional society to social mobility, equal opportunity, the rule of law and individual freedom in modern society. However, several cultural, psychological and social barriers to modernization were to be crossed to reach the destination to be modern (see Box 1).

Development was thus modernization of traditional societies.

**Box 1**

<b>Modernization Theory A Simple Dualistic Typology</b>	
<b>Traditional</b>	<b>Modern</b>
Underdeveloped	Developed
Simple undifferentiated	Complex/differentiated
Rural economy & society	Urban economy & society
Low productivity of Land	High productivity of Land
Traditional technology	Scientific technology
Subsistence production	Production for exchange
Family labour	Wage labour
Agricultural economy	Industrial economy
Poverty	Prosperity
Un & Under-employment.	Full employment
Inequality	Equality
Illiteracy	Literacy
Low political participation	High political participation.

### The era of development economics

Development economists conceived that economic development would clearly revolve around industrialization and the transfer of an under-employed rural labour force to more productive occupations in the urban-industrial sector. Raguvar Nurske and Arthur Lewis were noted exponents of such arguments as development as structural transformation. In terms of the economics of growth, it was widely assumed in the 1950s and 1960s that market failure was the norm in developing countries. The state would have to mobilize domestic and foreign savings to create an investment pool from which it could finance a programme of directed industrial development. Direction usually came in the form of state development plans and by means of the controls that most development states exercise over scarce foreign exchange reserves. The state would also protect infant industries by means of tariff and quota policies (hence, import-substitution

industrialization), and would encourage investment in heavy industries like steel and engineering – the ‘commanding heights of the economy’ according to India’s Second and Third Five Year Plans (1956-66) – by running such industries themselves. The state alone was credited with the ability to think and act in the long-term interest of all its citizens. Markets would play a supporting role in most capitalist developing countries, and the state would embody all that was most modern.

It was also widely accepted that developing countries could and should learn from the development experiences of the already developed, or pioneer countries. (they could also learn from the experiences of the late-industrializing countries of Eastern Europe). Walt Whitman Rostow has perhaps been most closely associated with the view that there is a common pathway to development which has to be trod by all countries intent on becoming modern. Rostow's stages of development had proposed five unidirectional development stages for all societies like: traditional society, preconditions for take-off, take-off, the drive to maturity, high mass consumption. Latecomer societies have to ‘take-off’ into development (a suitably space-conquering metaphor for the late 1950s/1960s when the USA and the USSR were competing with each other above the Earth as well as on it) by mobilizing a critical mass of savings and investing it carefully in private and public programmes of industrialization. Happily, the fact that latecomer societies could draw on the experiences and resources of the pioneer countries meant that the transition from a state of tradition to a state of modernity could be accomplished quite rapidly. The only danger was that some countries would choose the deviant route of socialism-communism!!

### **Box2. Common Features of Mainstream Development Theories**

1. Development is identical to growth.
2. Capital accumulation is the key sector to growth.
3. Industrialization: key sector for achieving higher rates of growth.
4. State intervention is necessary due to market failures and it accelerates growth (development strategies & planning).
5. Eurocentric, Western – or Northern-Centric.
6. “single barrier” theories: (a) economic: key obstacle is low savings and lack of capital or (b) social: traditional values & culture.
7. Causes of underdevelopment: mainly internal.
8. Unequal distribution of income is justified: Growth will “trickle-down” thesis.
9. Developing Countries are largely seen as homogenous.
10. Optimism about development closing the gap and catching-up. Benign influence of Developed Countries.
11. Developed and Less Developed Countries have mutual interests: Aid and trade.

### **Dependency**

Dependency theory became popular in the 1960s and 1970s as a criticism of modernization theory that seemed to be failing due to the continued widespread poverty of large parts of the world. The term ‘centre-periphery’ was first used by Werner Sombart who, in his 1928 analysis of the history of European capitalism, wrote of a dominant

‘centre’ – Great Britain, supported by the United States – and an exploited and dominated ‘periphery’ consisting of Central, Eastern and Southern Europe. Thus the European economy was regarded as having a hierarchical structure. Dealing with the world economy, the same terminology was later used by Raul Prebisch to characterize the relations between the poor pre industrial countries of the world and the rich industrial countries. From then on ‘centre-periphery’ became a term to describe the dualism of the world economy between ‘North’ and ‘South’. Prebisch’s argument, in 1949, was that the LDCs, as exporters of primary products, had only relatively small benefits from international trade because of the (alleged) tendency for their barter terms of trade to deteriorate. Several writers in the broad dependencia tradition have advanced the neo-Marxist views propounded by Guntar Frank, Samir Amin, Paul Baran, Arghiri Emmanuel, Walter Rodney and Immanuel Wallerstein.

The hard-line position within the dependency camp was the ‘development of underdevelopment’ position. Frank argued that the industrial development in the core and underdevelopment in the periphery, are two sides of the same global capitalist coin. Metropolitan capitalism depends on the exploitation and active underdevelopment of an already capitalist periphery. According to Frank, old style colonialism has simply given way to neo-colonialism dominated by the IMF and the multinationals, and enforced by transfer pricing and unequal exchange in world trade. The choice for the Third World lies between the continuing barbarism of capitalism or the great promise of socialism.

### **Box3. Common Features of Critical Development Theory**

1. Critical of mainstream development theory.
2. Non-dualist view: some binary categories but interlinkages, one system.
3. Cause and continuance of underdevelopment: largely external.
4. Meaning of development: achieve equal exchange, economic & social articulation, self-sustaining & autonomous development, non-subordinate relations, self-reliance, etc.
5. Largely a Third World or Southern contribution to development theory.
6. Concerned with equity between & within countries.
7. Stress on State intervention and comprehensive planning.
8. Priority given to industrialization to develop a capital-goods sector (technology).
9. Policies: vary from reforming world capitalism to overthrowing it and start transition to world socialism.

### **Alternative Development**

By the early 1970s, the extent of poverty in large parts of the world became a major question mark and the optimism of development trickling down waned. Newer frameworks and urgent direct measures were sought to alleviate poverty. Many governments started programmes to directly address poverty (e.g. the slogan of ‘garibi hatao’ and the resultant twenty point programme of Prime Minister Indira Gandhi in India in the early 1970s). However, alternative development fits better and apt in the

community development programmes outside the state sector. Alternative development is a *redefinition of development* as:

Development is a process by which the members of a society increase their personal and institutional capacities to mobilize and manage resources to produce sustainable and justly distributed improvements in their quality of life consistent with their own aspirations (Korten, 1990).

The best way to grapple with alternative development in practice is to equate it to the current development practices of NGOs/development organizations. These organizations work with the presumptions about the limitations of state-led development and works to democratize it by bringing concepts like people's participation and empowerment with a focus on the local context.

Alternative development – criticisms in practice

- Gap between theory and practice
- External ideas and methods inappropriate to local conditions
- Result: extension of state control through patron-client relations, conventional projects, run by local elite group
- Many projects too costly, difficult to monitor, too complex and poorly designed
- Limited scope; small isolated projects create an illusion of reform for a few people
- Ad hoc projects working at cross-purposes with macroeconomic policies not much institutional support in ministries
- Ignoring the role of intermediaries, animators, facilitator organizations

Alternative development – criticisms in theory

- No rigorous alternative analyses of Third World development; no adequate analysis of the structural causes of poverty
- Lack of analysis of the local: romanticization of local.
- Pays scant attention to power structures in societies/communities fragmented along class, gender, ethnic, and other fractional lines

### **Neo-Liberalism**

In the 1980s, some writers attacked what they see as the damaging consensus on development economics that took shape soon after World War II: a consensus which fail to see that most states are likely to be predatory, rent-seeking economic actors, and fails to recognize that state failures are at least as likely as market failures in the developing world, and far more damaging. They proclaimed 'trade not aid' and 'privatization not nationalization'.

The main points of neo-liberalism include<sup>1</sup>:

*Liberalisation:* Liberating private enterprise from any bonds imposed by the government, greater openness to international trade and investment, reduction in workers' rights, less price controls are some of the methods suggested to make the market work better. However, cutting public expenditure for social services like education and health care in the name of reducing government's role reduce the safety-net for the poor, and even maintenance of public infra structure like water supply.

*Deregulation:* Reduce government regulation of everything that could diminish profits, including protecting the environment and safety on the job.

*Privatization:* Sell (disinvest) state-owned enterprises, goods and services to private investors. This includes banks, key industries, infra structure and services. Although usually done in the name of greater efficiency, which is often needed, privatization has mainly had the effect of concentrating wealth even more in a few hands and making the public pay even more for its needs.

All these together works as “Structural Adjustment Programmes’ in countries mainly orchestrated by the international financial institutions. Neo liberalism in development theory and policy has also been attacked for its simplistic accounts of the nature of ‘real’ markets in many developing countries and for its one-dimensional accounts of what motivates apparently isolated economic actors. This is also a meta narrative (or jumbo theory) of development that attempts to squeeze a diverse social reality into the straitjacket of a singular way of seeing or way of thinking. However, this is the dominant paradigm that reigns the development world today with dominant international financial institutions like the World bank and IMF its mantle holders.

## **Human Development**

Human Development (HD) is another redefinition of development that surfaced in 1990 with the basic purpose of development to enlarge people’s choices.’ and argues that ‘development is not of expanding supplies of commodities, but of enhancing the capabilities of people.’. HD also developed tangible indices (beyond GDP etc) to measure development as given in Box. Thus the Human Development Index (HDI) is a comparative measure of life expectancy, literacy, education, and standard of living for countries worldwide. It is a standard means of measuring well-being and indicate whether a country is a developed, developing, or underdeveloped country as far as HD is concerned. It could indicate impact of economic policies on quality of life. The well-being or quality of life of a population is an important concern and is measured by many social and economic factors. A large part is standard of living, the amount of money and access to goods and services that a person has; these numbers are fairly easily measured. Others like freedom, happiness, art, environmental health, and innovation are less tangible and hence difficult to measure.

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<sup>1</sup> See Martinez and Garcia (2000) for details.

The index was developed in 1990 mainly by South Asian economists, the Indian born Amartya Sen and the Pakistani economist Mahbub ul Haq, with help from Gustav Ranis of Yale University and Lord Meghnad Desai of the London School of Economics and has been used since then by the United Nations Development Programme in its annual Human Development Reports and the major torch bearer of the paradigm. It has come out with global, national and sub national level human development reports, which could be used as a comparative scale to measure HD across different spaces (regions) and social divisions (disaggregated to caste, ethnicity, gender etc). ,

**Box 4: Human Development**

<p><b>HD INDEX</b></p> <ul style="list-style-type: none"> <li>• Longevity                                      life expectancy</li> <li>• Knowledge                                    literacy and mean years of schooling</li> <li>• Income    real GDP per capita in purchasing power parity</li> </ul>
<p><b>Differences between HDI and GDP</b></p> <p>The following distinctions clearly demarcate how HD is superior to conventional economic indices like GDP</p> <ul style="list-style-type: none"> <li>• Measures education and health and is thus multidimensional</li> <li>• Focuses attention of policy makers on ultimate objectives of development, not just the means</li> <li>• More meaningful as a national average because there are much greater extremes in income distribution than in distribution of life expectancy and literacy</li> <li>• Can be disaggregated by gender, ethnicity or region</li> </ul>
<p><b>Strengths of Human Development</b></p> <ul style="list-style-type: none"> <li>• is measurable</li> <li>• makes the difference between economic growth and HD measurable</li> <li>• rejects trickle-down and proposes trickle-up economics</li> <li>• combines the soft (social) and hard (economic) dimensions of development</li> </ul>
<p><b>Four ways to create desirable links between economic growth and HD:</b></p> <ul style="list-style-type: none"> <li>• investment in education, health and skills of people</li> <li>• more equitable distribution of income and assets</li> <li>• social expenditures by the government</li> <li>• empowerment – especially women</li> </ul>



## **Post-Development**

Post development (PD) is a radical critique on the hitherto understood concept and practice of development. Post or 'anti-development' scholars and activists condemn post-second world war efforts at development for imposing on non-western populations a peculiarly Western conception of industrial progress and economic growth that has proved difficult to promote in practice, and undesirable as an end-state. According to them, the West is a source of 'disease' which threatens to infect the more authentic and sustainable livelihood systems of 'less-developed' countries. These thinkers attempt to show how Western conceptions of development and development planning seek to normalize non-Western populations, or make the latter more like the former by command. This process of development/anti-development obviously works to the advantage of Western companies and enjoys the support of elite groups and the state in developing countries. According to Escobar, development planning is a form of technical knowledge that has lent legitimacy to this notion and that the state in the Third World is usually an instrument of neo-colonialism. For PD, knowledge is power and the state's knowledge is expressed in the form of development plans. By contrast, the voices of the 'victims of development', the peoples and communities whose lives are being re-made in its name, are denied a status equivalent to the 'scientific' edicts of the modern state (e.g. voices of indigenous people ousted by dams).

Ecological degradation, large scale displacements etc are projected as signs of decay of the edifice of development built over the last decades.

Some sources and currents of post-development: Gandhian thinking, ecological thinking (limits to growth) & deep ecology (anti-growth), ecofeminism, grassroots social movements, development failures.

Affirmative strands: Quality, not quantity. Gandhian simplicity. Community. Resistance, local struggles, local autonomy, indigenous knowledge.

The alternative suggestion is people determining their own future, for what they want to do and doing it for themselves, exercising agency, actively moving forward to create better lives and improve their well-being according to their own priorities and criteria as they have done for millennia. It is about reclaiming confidence in and reliance on local ways of thinking and indigenous knowledge about people actively struggling for liberation, trying to create space, to recapture their independence, often by the many small actions people undertake on a daily basis. Although the struggles in local contexts to reclaim control over resources remain valid, it remains a paradigm in the periphery without much takers to build a critical political constituency for it. The criticism against post development is that such "Dichotomous" thinking (for or against development) makes post development arguments simplistic. The major strands of development thinking are summarized in Table 1.

**Table 1: Major theories and definitions of development**

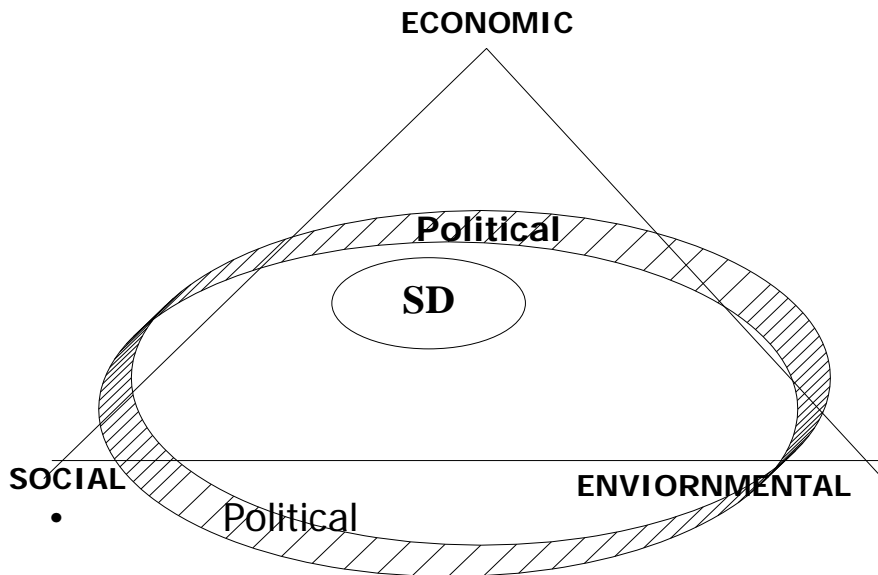
Perspectives	Definitions	Sources
<b>Modernization</b>	Development is <b>state-led</b> economic growth through modernization (i.e. industrialization, foreign aid, following western model, linear progress)	Arthur Lewis, Walt Rostow, Shils, Eisenstadt
<b>Dependencia</b>	Development is dependent and unequal and thus underdevelopment. It should be <b>state-led</b> autocentric development (by national bourgeoisie, i.e. 'dependent and associated development', or through delinking).	Prebisch, Furtado, dos Santos, Sunkel, Baran, Frank, Amin, Cardoso
<b>Alternative development</b>	Development is <b>society-led</b> transformation and should be equitable, sustainable, participatory. Themes: state & market failure, local and civic actors	Hettne, Friedmann, Korten, Max-Neef, Rahman, Carmen, Henderson, Brohman
<b>Neoclassical economics, neoliberalism</b>	Development is <b>market-led</b> economic growth. Policy: get prices right; curb state failure through structural reform (deregulation, liberalization, privatization)	Deepak Lal, Peter Bauer
<b>Human development</b>	Human capacitation is the means and end of development. Policy: human resource development. Tool: HDI	A Sen, Jolly, Griffin, ul Haq, Streeten, HD Reports
<b>Post-development</b>	Development is destructive, immiserizing, authoritarian, passé. Tools: Discourse analysis, critique of science, modernity and social engineering	Esteva, Escobar, Rahnema, Rist, Latouche, W Sachs

### **Sustainable Development – A Conceptual Exploration**

The increasing environmental degradation and also livelihood crisis became imminent and environmental concerns were suggested to be put in development thinking and practice. The World Conference on Environment and Development in Stockholm in 1972, and the Earth Summits of Rio in 1992 and Johannesburg 2002 re-emphasised this global concern. Sustainable development however, is not an uncontested term. It piles up all hitherto-discussed concerns in development. We will try to dis aggregate the concerns integrated in the concept of sustainable development.

Figure 1 illustrates the dimensions of development. The main concerns that immediately spring in a discussion on development from the use of natural resources are economic, environmental and social. Users are interested in the financial profitability looked at from their own personal point of view, i.e., to obtain maximum net returns per unit land, which

is translated into economic growth at a societal level. For this, thrust is given to devise ways of increasing physical productivity with the use of technology using external inputs. These aspects we club together as the 'economic' concerns. The green revolution strategies in agriculture can be an ideal example to demonstrate this thinking. These need particular technology and are always tried in 'endowed' areas (fertile regions) and thrust was to maximise productivity by supporting wealthy farmers who can best make use of the technology and subsidised inputs.



**SD: Field of Sustainable Development**

**Fig 1: Dimensions of Development**

However, the user/farm has to be placed within the social structure to examine the relationship with other users/farms, i.e institutions (by this we mean a broad definition including formal rules/regulations/informal norms and organisations) of development. Institutions like tenancy and organisational forms (individual/co-operative/collective/semi-collective) of production can have a significant influence on the magnitude and intensity of development. In situations with the presence of a large number of labour subsisting on their manual labour for livelihood, the amount of labour absorption in development becomes a major criterion and these are the questions of social equity or the distributive aspects of development. Hence, besides the earlier mentioned individual concern, a society has larger social concerns, like the equitable distribution of the returns accruing from the development across the different segments of the population, which then demand a differentiated analysis of the social structure. The institutional and social aspects of development, we term as the 'social' concerns of development. Social concerns put the distributive aspects of development as the primary element. Here, the institutional factors like land distribution and property rights become important to facilitate access to resources. Then there are other issues like the labour

wages, gender division of labour and intra-household bargaining power of women<sup>2</sup> that are important in judging the social equity aspects of an activity. The critics of green revolution strategies argue with social concerns that it was detrimental to social equity where poor farmers and non-endowed regions were neglected.

Environmental concerns are those 'nature-first' concerns which determine the sustainability of flows (non-declining) from the stock of the natural resource base which is *environmental sustainability* and is closely linked to the *livelihood sustainability* of those who are dependent on that. For the third world countries, environmental degradation means a direct cut into the livelihood systems, which the majority of the population is dependent on.

The fourth dimension is the issues of power which dominates all the above mentioned dimensions. This is the realm of the 'political' concerns, where the differentiated interests in development are politicised, which then decide the change/continuity of development. Questions of political participation and politicisation of competing interests like the landed interests and labour interests and choice of technology are a major element in these discussions. The State policies also have influence on the process and hence the academic realm which generates knowledge, the policy-making realm which feeds on policy suggestions based on specific knowledge and the decision-taking realm of government are all important.

In Figure 1 the central ellipse represents sustainable development, which is the normative field that balances the three dimensions. However, the position of that field is determined by the power relations in the society. The multiple dimensions reduce the analytical sharpness of the concept. However, it will be useful as a normative concept through which development problems could be analysed, mainly to understand what is being addressed and what is ignored in programmes and policies. This introduction is useful to understand the parallels and changes in the water sector development in the last decades and in particular to understand another normative concept of integrated water resources management (hereafter IWRM).

## **Section 2<sup>3</sup>**

### **Hydraulic Mission to IWRM: Water Sector Development Paradigms**

#### **Hydraulic Mission and Impending Crisis**

Over the past century, all countries in the world including in South Asia have made substantial investments in large-scale water infrastructure to bring water to previously water scarce areas. For the most part the results of this 'hydraulic infrastructure platform'

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<sup>2</sup> For instance, studies point that a shift to commercial cropping from a food crop and mixed system, will lead to a situation whereby the activity is totally monetised and men in the household will get the access and control over the returns pushing the women and children to a dependence on market for food which again needs money.

<sup>3</sup> This section is developed majorly from the Briscoe and Malik (2007), Mollinga (2006) and Allan (2006).

have been spectacular both nationally (through the production of food grains and electricity, for example) and regionally (where such projects have generated large direct and equally large indirect economic benefits). This ‘**hydraulic mission**’ was mostly designed and provided by the state. According to Briscoe and Malik (2007), the global experience shows that the returns to investments in water infrastructure and management follow the broad outlines shown in Figure 2. During the first development stage, the challenges were predominantly engineering in nature. In India Arthur Cotton and other pioneering engineers were worshipped as saints, and dams became ‘the temples of modern India’. The very success of this enterprise, as in other societies and for other issues, carried the seeds of its own downfall. As an infrastructure platform was built, the ‘Type 2’ and Type 3’ challenges of maintenance, operation, and management started to emerge. The uni-functional (‘build’) and unidisciplinary (‘engineering’) bureaucracy adopted the command-and-control philosophy of the early decades of independence, seeing users as subjects (and the state the provider) rather than partners or clients. The underlying tenets of modernization with State as the provider and designer of development are evident here. However, the challenges of the state water machinery to address the provision of public irrigation and water supply services are increasingly becoming evident. User charges are negligible, resulting in lack of accountability and insufficient generation of revenue even for operations and maintenance.

India’s Water Economy

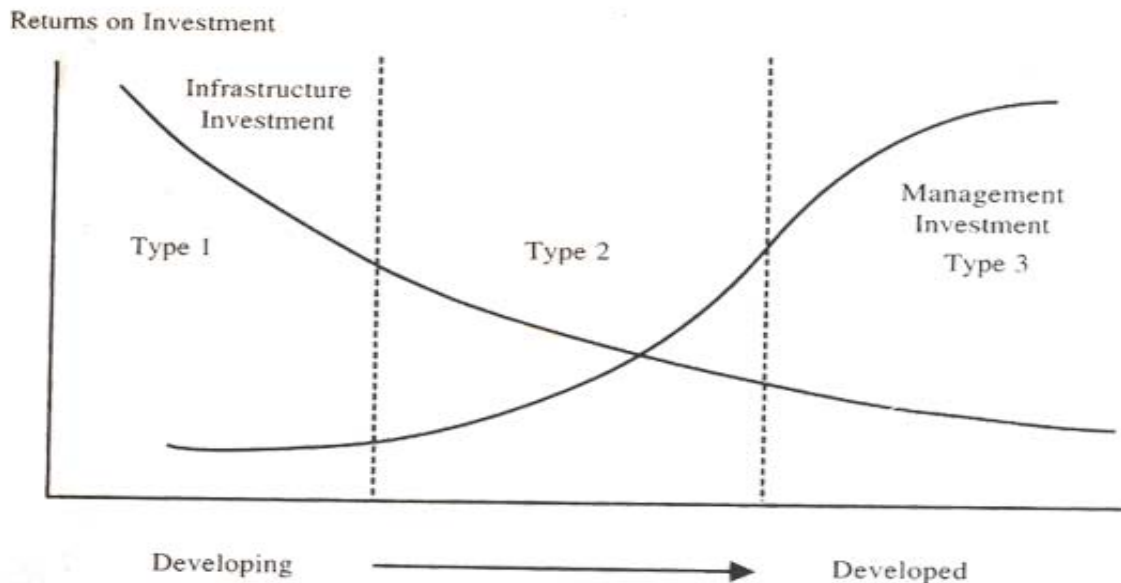


Figure 1.1: Rates of Return on Investment on Infrastructure and Management of Water Resources

Source: Briscoe, John and R.P.S. Malik (2006).

**Fig 2: Rates of Return on Investement on Infrastructure and Management of Water Resources**

Source: Briscoe and Malik (2007).

Some of the criticisms from the likes of international financial institutions is that the gap between tariff and value of irrigation and water supply services has fuelled corruption,

staffing levels are ten times international norms, and that most public funds are now spent feeding the administrative machinery, not maintaining the stock of infrastructure or providing services. The implicit philosophy has been described as “build-neglect-rebuild”. This means that public financing is not available for the vital tasks of providing new irrigation, water supply, and waste water infrastructure to serve growing populations and the un-served poor. The water sector is thus facing a major financing gap. These needs are amplified by the fact that large proportions of recurrent budgets are spent on personnel, not on real maintenance, and on electricity, irrigation, and water supply subsidies. On the ‘supply side’ there are ultimately only two sources of financing-tax revenues and user charges. The budgetary allocations to the water sector is falling, as a payment by users. This raises the second issue of social equity – access and control over water and water infrastructure.

This decline in the quality of public irrigation and water supply services would normally be expected to produce social unrest and political pressure. But to the (temporary) rescue of Indian society came a simple and remarkable transformational technology-the tube well. With large areas of India having substantial and easily-accessible aquifers, people were able to ignore the inconvenience of poorly functioning public systems and become self-reliant using groundwater. In many ways this ‘era of the individual coping strategies’ has been remarkably successful.

- Irrigators have are relying on tube wells on a massive scale<sup>4</sup>
- The urban middle class have learned to make do with irregular, unpredictable, and often polluted public water services - include investments in household storage, purchase of bottled water, household water purification systems and private wells.
- Industry, too, has coped with very-high cost ‘captive’ alternatives (including reverse osmosis treatment of wastewater and desalination)
- The situation of the poor in urban areas is far worse. They are powerless and therefore at the end of the line when the inevitable rationing takes place and depend heavily on water vendors, supplied by groundwater, and provide water of very high costs.

The National Commission on Water of 1999 has shown that overall water balances are precarious, that crisis situations already exist in a number of basins, and that by 2050 India’s demands will exceed all available sources of supply. The above discussion brings the vital neglect of social dimension (exclusion of poor) and points to the impending (environmental) resource crisis.

The water sector thus provides a bleak scenario with hydraulic mission with the preoccupation of the economic dimension (with partly social dimension of food security) still in ascendance. In the 1990s, there were policy changes like the participatory

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<sup>4</sup>With 20 million tube wells in India, groundwater now accounts for over 50 per cent of irrigated area.

Irrigation Management (PIM), which squarely addressed social concerns taking on board issues of participation and accountability. There are a number of implementation issues with the hydraulic bureaucracy not ready to imbibe these values. Environmental concerns remain as policy rhetoric. An important manifestation of the breakdown of the current system is the growing incidence and severity of water conflicts-between industry and villagers, between farmers and the environment, and within irrigated areas. Confronted with this reality of limited supplies and growing and changing demands, the need is obviously for a management framework which stimulates efficiency and which facilitates voluntary transfer of water as societal needs change. Here is where the new paradigm of integrated water resources management or IWRM enters the scene. The next sections will examine the evolution, scope and constraints of the concept of IWRM.

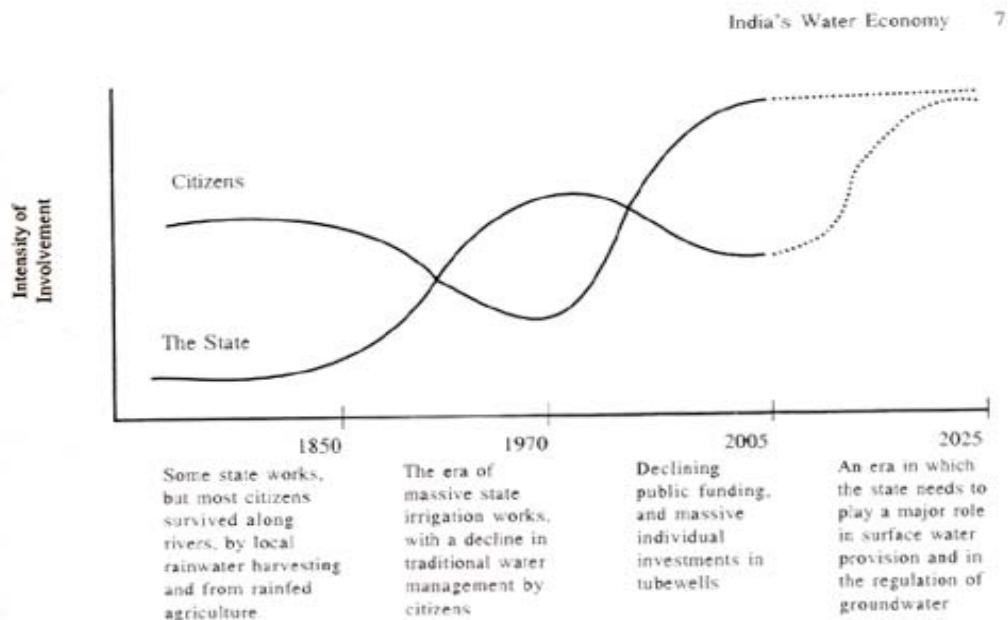


Figure 1.2: The Evolving Role of the Citizen and the State in Water Management  
Source: Same as Figure 1.1.

**Fig 3: Evolving Role of Citizen and State in Water Management**  
**Source: Briscoe and Malik (2007).**

Fig 3 provides a schematic sense of the necessary ‘next stage’ in the evolution of water management in South Asia.

**Emergence of IWRM**

IWRM has gained currency recently in the international discourses on water management. It is already been mainstreamed by international organizations and financial institutions as a way out to many of the global problems of water management. The subsequent discussions will critically engage with this concept.

The Global Water Partnership defines IWRM as follows:

IWRM is a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP 2000; 22).

Integrated water resources management has undoubtedly gained currency and prominence since the 1992 Dublin and Rio de Janeiro international conferences which covered the issues of water, environment and development. These conferences formulated the so-called Dublin-Rio principles, which are listed in Box 7.

**Box 7. The Dublin-Rio Principles**

The Dublin principles are:

1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
2. Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
3. Women play a central part in the provision, management and safeguarding of water.
4. Water has an economic value and should be recognized as an economic good.

**Source: Mollinga (2006)**

IWRM may not be as universally supported as is sometimes claimed in the global water debate. It has been argued by different people that the so-called global consensus is a collection of several, and not necessarily internally consistent, ideas. Three of the main ones are.

1. Integrated Water Resource Management (IWRM), in association with River Basin Management (RBM) meaning from administrative to resource-based management;
2. Participation and stakeholder involvement meaning from centrally administered to user-based management institutions; and
3. Privatization/liberalization meaning from state to market-driven regulation

These three components are three sets of ideas, each with a different history and supporting coalition. They have been brought under a single roof by writing them into 'consensus' global water policy documents (like the piling of the often conflicting dimensions in sustainable development).

IWRM with the establishment of river basin organizations allows existing, technocratic water resources agencies to continue their dominance in the water sector by re-inventing themselves as basin level organizations on the dimensions of participation and inclusive governance. It tries to lift participation from a local phenomenon (in the village or the local water users' group), to a higher policy and regional level. The instruments are dialogues and multistakeholder platforms/institutions. Though the extension of



participatory management to participatory governance can be considered as a step forward, dialogue approaches can easily become naïve when ‘consensus’ is expected or projected, and dialogues are not seen as inherently political.

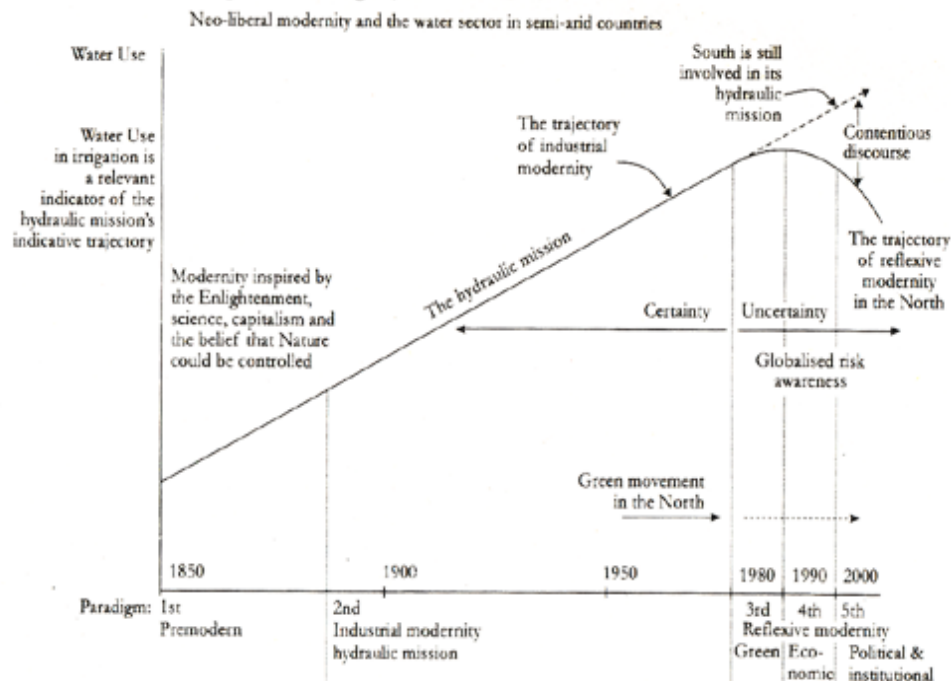
In South Asia the ecological concern is just beginning to be addressed in mainstream water resources policy, despite considerable lobbying by environmental groups. With such criticisms of conceptual clarity and scope, little is left of IWRM as a sharp and precise conceptual tool. IWRM can be better understood as a ‘boundary concept’ that allows different constituencies attaching different meanings or emphases to the concept to interact with each other and negotiate the operationalisation of these different meanings and their combinations. At the World Water Forum in the Hague, the political viewpoint advocating that water is an economic resource rather than a social resource was strongly contested. Water pricing instruments and privatization were also very loudly opposed from the first moments of the forum.

The next section describes the five global water management paradigms, which will illustrate the evolution of the concept of IWRM and clarifies it.

### **Five Paradigms of Water Management**

Five water management paradigms are identified by Allan (2006). The first paradigm is associated with *pre-modern communities* with limited technical or organizational capacity. The second paradigm is that of *industrial modernity*. In the water sector the ideas of the Enlightenment, engineering capacity, and the science and investment initiatives of the state and the private sector characterized industrial modernity. Industrial modernity was manifest as the hydraulic mission of the mid-20<sup>th</sup> century.

Figure 2.1: The Five Water Management Paradigms, 1850–2000



**Fig 5: The Five Water Management Paradigms, 1850-2000**

Source: Allan (2206)

This project seized both liberal western economies (especially the United States) as well as the centrally planned economies of the Soviet Union. The hydraulic mission proved to be readily exportable to the South in the second half of the 20<sup>th</sup> century.

According to social theory, the ideas underpinning industrial modernity were challenged during the 1960s and the 1970s. In the North in the water sector the reflexive response is evident in three water management paradigms. This phase witnessed a reduction of water use in agriculture in a number of semi-arid industrialized economies: Australia, California, Arizona and Israel. This reflexive phase can be shown to have three sub-phases (viz., the third, fourth and fifth paradigms). The **third paradigm** is the change of water allocation and management priorities inspired by the *environmental awareness* of the green movement. These activists succeeded in persuading governments and voters in industrialized semi-arid regions to allocate water to the environment and reduce allocations to agriculture. Their campaigns started in the 1960s but it was not until the 1980s that evidence of the influence on policy became evident in water use figures. This paradigm reflecting environmental concerns popular in the north since 1970s has only achieved very limited purchase on water policy-making in the South.

In the 1990s a further set of principles gained currency. That water is an economic resource was very widely adopted by the Northern professional water community. The **fourth paradigm** was inspired by economists who had drawn the attention of water users in the North to the *economic value of water* and its importance as a scarce economic input. There has been an attempt to export them to the South via agencies such as the World

Bank and through the institutions such as UNCED, the World Water Council and the Global Water Partnership, and the associated global water fora in the Hague in 2000 and in Kyoto in 2003. This economically inspired paradigm has been resoundingly rejected in the South.

Meanwhile, another paradigm has emerged in the last years of the 1990s-that of integrated water resource management (IWRM). IWRM requires a holistic approach and an unprecedented level of political cooperation.

The environmental and economic phases are still in train and they are being supplemented by a new **fifth paradigm**, which is based on the notion that water allocation and management are political processes. This approach is especially relevant to IWRM/IWRAM. Environmental fundamentals such as the hydrological logic of the river basin and economic fundamentals relating to the value of water are central to the paradigm and to the implementation of *integrated water resources management (IWRM)*. The argument is that IWRM should be expanded to IWRAM. The 'A' here stands for allocation. Allocation is unavoidably a political process. Water professionals tend to ignore the allocative role of management. *With allocation being ignored, management can be projected as a technical matter susceptible to modeling. In practice the political pressures associated with contentious allocation over whelm the information provided by the technical professionals. Integration is also a political process, as all those who have attempted to take interdisciplinary approaches know.*

IWRM/IWRAM demands much more than the mere recognition of the environmental and economic value of water and the planning of engineering and economic interventions. IWRAM is an intensely political process because water users have interests which they do not want diminished by interventions which contradict their immediate security. Prioritizing water allocation with an eye on the economy in general and prioritizing investment to reduce environmental impacts will conflict with the immediate concerns of current water users. The fifth paradigm has brought forward approaches which include participation, consultation and inclusive political institutions to enable the mediation of the conflicting interests of water users and the agencies which manage water. This is similar to the 'political' realm in the conceptual framework of sustainable development elaborated earlier. The inclusive political process of the fifth paradigm requires that the interests of civil society including social movements, government, and the private sector are included in the policymaking discourse.

### **IWRAM: A NEW SANCTIONED DISCOURSE?**

The five water management paradigms were sanctioned, or limited, in the scope of their consideration of relevant ideas through ignoring underlying fundamentals. The process is summarized as seen in Table 2:

**Table 2. The Characteristics of the Five Water Management Paradigms**

<i>Water Management Evidence/Paradigm Reform</i>	<i>Inspiration</i>	<i>Sanctioned Assumptions and sanctioned Information/Approaches for Water Policy and</i>
<i>Pre-modern Paradigm 1</i>	Local secure Provision	Domestic & Livelihood water inviolable social resources
<i>Industrial modernity Paradigm 2</i>	(late 19 <sup>th</sup> century) Hydraulic mission	<b>Nature can be controlled</b> 'Certainty' that the interests of the state, its development agencies, the irrigators, the power generators, etc., were engaged in essential and appropriate activities
<i>Late modernity(the late 1970s and 1980s) Paradigm 3</i>	Environmental security	Nature cannot be controlled 'Uncertainty' Water in the environment was essential in underpinning environmental services Water should be returned from irrigation to the environment <b>Environmental considerations are primary</b>
<i>Significant from about 1990 Paradigm 4</i>	Economic efficiency	Water is an economic resource Water has an economic value Water should be used according to principles of allocative efficiency <b>Economic principle are primary</b>
<i>Significant from the late 1990s Paradigm5</i>	Participatory Inclusive Integrated  Approach	Integration of professional discourse is political  Water allocation and management is a political process  River basin is a fundamental hydrological unit  But global economic systems are more likely to bring amelioration in regions facing extreme water shortages  <b>There is a danger of the sanctioning of the IWRAM approach if ANY of the above are NOT included in the approach</b>

Source: Allan (2006)

A major purpose of this section was to show that the political contention associated with water policymaking is dynamic. In the industrialized countries in the semi-arid North, five water management paradigms can be identified from pre-modernity to the present.

The plural South is very much engaged in its industrializing mode (and hydraulic mission), which involves the control of water resources to increase agricultural output and to generate power. The contention between newly informed Northern outsiders arguing for the inclusion of environmental and economic priorities into water policy could work only with politically feasible circumstances which will facilitate the new approaches. IWRM (also an imported concept) has to be placed in this background. Fig 6 illustrates the parallels of IWRM with sustainable development. Water sector development remains at the hydraulic mission and hence largely the economic (and partly social) dimensions still dominate. The current debates in IWRM (imported from the North) are trying to bring in the neglected environmental dimensions and push the economic arguments. However, what is less discussed is the process of water allocation that is imminently political that mediates between these dimensions.

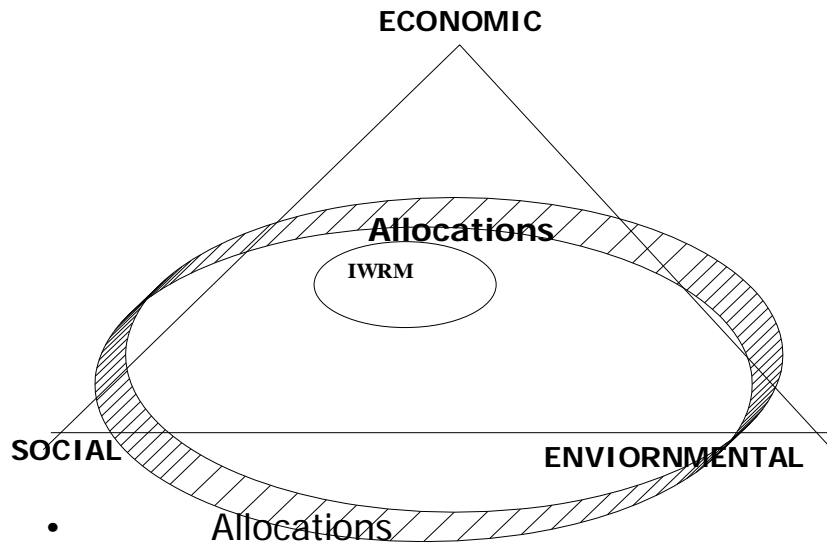


Fig 6: Conceptual Framework of IWRM

### Conclusions

Sections 1 and 2 clarified the multiple dimensions and the evolution of two concepts—Sustainable Development and IWRM. The meaning of development and water sector development in the last six decades started with the concept of growth and hydraulic mission. Here the overwhelming goal was economic development. Over a period, equity and social justice concerns were brought into the debate. Environmental considerations has gained much attention in the northern countries and received policy attention with poor track record of implementation in Southern countries. The tension between the arguments of environmental sustainability and imperatives of continued growth is imminent in the negotiations in sustainable development (that evidently surfaced in the Johannesburg summit) as well as a shift to IWRM debates in the water sector. The

argument of water as an economic good is rejected mostly in the South. The political negotiations between the carriers of these vantage points determine how development as well as water sector development takes its course in the future. Hence future water management scenarios would have to seriously look at questions of allocations which is a political process. Both the concepts of sustainable development and IWRM are seen to be normative that has piled up important issues and hence analytically difficult to offer simple solutions. However, these normative concepts could be useful as 'boundary concepts' to bring together (contextually) competing constituencies for negotiated development and water management. A shift in favour of the neglected dimensions of social justice, equity and environmental sustainability is necessary in place of the conventional arguments of hydraulic mission. The issues, processes and importance of such a shift is the focus of the present training.

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