

**Multi-stakeholders' Dialogue as an Approach towards Sustainable Use
of Groundwater: Some experiences in the Palar River basin, South
India**

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Abstract

Due to rapid urbanization and brisk industrialization, there has been growing competing demand for groundwater among various users and sectors. A disturbing feature of this 'developmental process' has been intense pollution and conflicts. In this paper it is argued that groundwater – which is regarded as a common pool resource – has been subject to over extraction and pollution due to unlimited and unregulated access enjoyed by individuals. This has implications for rural indebtedness, unemployment, poverty, social inequity and conflict in rural India. All available institutional mechanisms have failed to restore order in such stressed river basins. In such a critical situation, multi-stakeholders' dialogue (MSD) is seemingly a logical solution to find ways forward. Thus, the MSD process was initiated in the Palar river basin (one of the heavily stressed river basins in southern India) in the year 2002 and the results of this initiative have been quite encouraging. The dialogue process is ongoing but its success very much depends upon the support that it gets from the government.

1 Introduction

The basic motivation of this paper is to demonstrate how groundwater, which is regarded as a common pool resource has been subject to over extraction and pollution due to unlimited access enjoyed by individuals and due to competing users. This has implications for increasing rural indebtedness, rural unemployment, rural poverty, social inequity and conflict in many parts of India, particularly in the State of Tamil Nadu.

For rural agricultural populations groundwater has almost replaced land as a determinant of social and economic status. Further increasing groundwater access has undermined maintenance of tank irrigation¹ systems and other surface sources. In the process it has shifted the determinants of water access away from communities and into the hands of individuals. Access to groundwater has never been equitable due to its natural variability and availability; this has contributed to the growing inequity in resource conditions, landownership and wealth. Patterns of inequity are socially embedded and exacerbated by factors such as inheritance patterns. In many cases, the ownership of individual wells is now divided among many people. This can be a source of conflict and often results in differential access between dominant owners and others who are less capable of exercising their partial ownership rights. Competition and conflict are increasing in the face of pollution and substantial water level declines. Falling water levels are leading to greater competition and, in many areas large financial losses, as existing wells become dry or new, unproductive, wells are drilled. In many areas, shallow dug wells have gone dry and farmers now drill multiple bores alongside or within existing dug wells. Water level drops are also leading to the decline of traditional surface sources, such as 'spring' channels (sub-surface flow / streams), which used to supply irrigation water to thousands of hectares of land. In other words, increasing access to 'private source of irrigation' namely wells, has contributed to rapid decline in the collective action of community based natural resources.

Water level declines and pollution are affecting the availability and reliability of water supplies for irrigation and other uses. Although farmers have responded to scarcity by adopting some water use technologies, water scarcity has resulted in reduced yields and crop pattern changes; this has a direct impact on agricultural incomes. Informal markets, for example, initially emerged as farmers with access to surplus water supplied to adjacent farmers who either lacked the financial resources to dig their own wells or had insufficient supplies in their wells. Now water markets are declining as farmers reserve all available supplies for their own use. Furthermore, even where water markets continue to exist, their operation is often highly inequitable since they function as part of interlocked land and labor markets where purchasers are dependent on the goodwill of

¹ Historically, tanks have been regarded as one of the most important common property resources in India, in **the south particularly**. Tanks played an extremely important role in contributing to agricultural growth until mid 1960s in many parts of India For details, see Janakarajan, 1993, Vaidyanathan, 2001, Anil Agarwal and Sunita Narain, 1997.

water sellers. As water becomes increasingly scarce, dependency relations intensify with purchasers in an ever-weaker bargaining position (Janakarajan, 1992. Shah, 1993).

What does this imply for policy? The evidence of increasing poverty due to degradation of groundwater resource base implies that government policies supporting further groundwater development in areas suffering from overdraft must be changed. Policies such as supply of highly subsidized power for all sections of farmers are problematic. Furthermore, there is a great deal of ambiguity in defining rights over groundwater; as per the existing norms, anyone who has got access to a piece of land is also the *de facto* and *de jure* owner of the groundwater underneath. Since the amount of groundwater that can be extracted is not dependent upon the extent of land owned, seemingly there are no limits to groundwater that can be extracted provided a land owner possesses resources to drill deep bores, availability of potential aquifers and diesel or electrical energy for pumping. In addition to encouraging indiscriminate and wholesale pumping, the benefits from such policies are largely captured by wealthy sections of the rural population as well as by those of urban rich who extract and transport groundwater from rural to urban areas for industrial and other uses. The urban users not only take away potable water from rural areas but they also turn out the used water as sewage and effluent back into the rural areas. This requires a strong policy intervention to regulate water transport as well as to control pollution generation. Such policy interventions are often either ineffective or fictional. Overall, policies that support more equitable access to – and sustainable use of – available groundwater resources are essential. Furthermore, in areas where inequity is high and current groundwater use patterns are unsustainable, policies to support the efforts of marginal populations to shift out of agriculture and into other forms of livelihood may be required. Inherent inequities in power relations within rural communities of South Asia imply that ‘simple’ legal or other reforms to directly address groundwater overdraft and pollution are likely to be insufficient. Therefore, to make policies effective, appropriate law enforcement and monitoring mechanisms need to be evolved.

2 Use and Abuse of Groundwater

The expansion of groundwater irrigation in India has two distinct phases, first, beginning from the mid-1960s to 1990 and the second, from 1990 onwards. The first phase begins with the introduction of high yielding crop technology and ends around the time when the economic liberalization process began in India and elsewhere in South Asia. The second phase began with the opening of the Indian economy to the international market. The first phase was the period in which well irrigation was growing at an exponential rate. During this period, groundwater irrigation proved to be more profitable for well-owning farmers, as it helped to increase productivity, farm employment, stabilized production and livelihoods, reduced vulnerability and intensified cultivation and above all helped to build capital formation and household savings. Indeed, over the past few decades groundwater has played a critical role in increasing India’s food production (Janakarajan and Moench 2003). Furthermore, well irrigation has been considered a key factor in addressing issues such as poverty reduction. The reverse is also equally true when groundwater overdraft and pollution reach unbearable proportions

(Moench 1992a 1992b, Janakarajan, 2003). This is exactly what has happened in the second phase. In many areas, the twin problems of groundwater overdraft and pollution have not only resulted in the reduction of groundwater stock, but has also adversely affected crop yields, farm income and health and has aggravated the problem of rural – urban migration (forced migration). Farmers have started feeling the burden of maintaining a well due to ‘competitive deepening’, leading to the continuous fall of water tables, increased unit cost of pumping water, competing demand for water from industries and urban domestic users. And for many, wells have become a source of debt accumulation and this is particularly true in the low rainfall regions of South India, where although the first phase of groundwater expansion contributed to the welfare (both for individuals and for the society), the second phase of intensive groundwater use has contributed to *illfare*.

In the second phase of the past decade or so, the key issues which attracted the attention of many researchers centered on the theme ‘hard times’ or ‘adversity’. Some of the broad issues of this phase were: mining of groundwater, increasing investment on wells, conflicts and competition, rural-urban water transactions, mismatch between extraction and recharge, groundwater pollution, sea water intrusion and groundwater – energy nexus as a mechanism to control groundwater over-extraction. (see, for instance, Bhatia 1992; Rao 1993; Moench 1992a 1992b; Vaidyanathan 1996; and Janakarajan 1997a, Janakarajan and Moench 2003, Moench, Elizabeth Caspari and Ajaya Dixit, 1999). However, little data is available to document the extent of water level declines in specific locations². However, the field level data gathered by the present author in a couple of river basins called the Palar and the Noyyal in Tamilnadu shows a rapid decline in the groundwater table over the past couple of decades (Janakarajan and Moench 2003). Steep decline in the water table has also been accompanied by changes in modern water extraction technologies. As a consequence, there has been an intensive and extensive competition between well owners within rural areas in groundwater extraction. In addition, because many farmers have installed lateral as well as vertical bores, water availability in adjacent wells is often severely affected. While disputes over water and well deepening are common, no dispute from lateral bore installations was reported in our survey, even when they penetrated adjacent farmlands. Despite the extent of competition and conflict over well deepening, farmers do not seek justice through the court of law because groundwater property rights are known to be quite ambiguous. This has heavy implications for future well users and adds tremendously to the costs faced by current users (Janakarajan 1997b). It is significant to note that competitive deepening is virtually absent in villages affected by pollution since farmers have no incentive to use groundwater for irrigation.

From the field data, it appears that ownership of wells and access to groundwater is quite diffused across all types of farmers. For instance, surveys carried out in three river basins in Tamilnadu, indicate that over two-thirds of wells are owned by small and marginal

² The most recent formal statement on the status of groundwater resources in India by the Central Ground Water Board was published in 1995 and is primarily based on data from 1989-1990; it contains no information on actual water level changes (Central Ground Water Board 1995). In most states, groundwater-monitoring data is insufficient to accurately document water level changes at a local level even if the data were made readily available (Moench 1994; World Bank 1998).

farmers who own less than 5 acres of land (Janakarajan, 1997 and 2001). The capacity of these wells, measured in terms of water yields and water quality, is quite poor compared to those owned by larger farm operations. Since for most of the year these wells remain dry, incidence of crop failure is very high among the smaller farmers. As a result, many who are already heavily in debt, tend to sell their land or abandon their wells. This class of farmers does not also have the option of purchasing water from water sellers, since the water market in the rural areas is on the decline due to groundwater depletion. Further, resource-rich farmers, who have surplus water, are keen to sell to urban users because the water commands a better price (Janakarajan, 1997, 1999, 2001).

Local groundwater conditions, given the inequity in its use pattern, variability and hydro-geological conditions and the presence or absence of pollution have a large impact on the costs of wells and irrigated areas. Well irrigation has become a gamble; not all those who invest in wells are successful. Many lose in the race of competitive deepening or wells go into disuse because of pollution. Many well owners either sell their land or become trapped in a cycle of debt as they construct new wells. A new dimension of inequality emerges as a result. Those who are able to keep up with competitive deepening emerge as potential water sellers; others are forced to having to buy water (Janakarajan 1997b; Vaidyanathan 1996).

Groundwater Pollution in the Palar River Basin

In many river basins in India, there are competing demands for water across different uses and users or between sectors such as agriculture, industry and domestic / municipal uses. This causes a tremendous stress on the limited available water resource, not only because groundwater is transported from rural to urban area, but also because of the release of a comparable quantity of water as effluent. And further, the ability of the future generations to sustain on the available natural resource base is seriously disturbed.

The Palar River Basin³ in Tamilnadu State is a case in point. Although tanks and spring channels have been the two most important traditional -community based - sources of irrigation, due to their dissipated condition and due to several socio-economic, technological and institutional factors, groundwater has emerged as the primary source of irrigation in this basin (Janakarajan, 1993). Net irrigated area by wells in the basin is about 75% (Rajagopal and Vaidyanathan, 1998). The study carried out by the Institute of Water Studies indicates that in the late 1980s there were about 132,000 irrigation wells in the basin area with a density of from 0.74 to 2.82 wells per hectare. Since then, the number of wells in the basin has increased significantly. Groundwater utilization is as

³ The Palar, one of the major rivers in Tamilnadu, covers an area of about 18,300 sq.km. Average annual rainfall ranges from 800 mm to 1200 mm. The climate is tropical and highly humid. Major irrigated crops in this basin are paddy, sugarcane and groundnut and major unirrigated crops are coarse cereals besides groundnut in water scarce areas. Tanks have historically been the most important surface irrigation source in the basin. There are about 700 tanks connected to the river channels with a combined command area of 61,000 hectares. These are called system tanks. Besides system tanks, a large number of non-system tanks also exist in this basin. There were also 606 spring channels which had their origin in the Palar river or its tributaries, which irrigated thousands of hectares along the villages located on both sides of the river (IWS, 2000). In many villages, even now, the spring channels remain but in a dissipated and silted condition.

high as 92 percent of all water use in this basin. In addition to agriculture uses, groundwater has been a major source for drinking and industrial water. Quality, however, varies a great deal across the basin. The leather industry has been the most important industrial activity in this basin. At the all India level, the leather industry contributes to 7% of the country's export earnings. The number of tanneries has multiplied since the banning of the semi-finished leather in the late 1970s. Since then the tanning technology has also changed from eco-friendly vegetable tanning to chrome tanning. Export earnings of leather industry shot up from a mere Rs.0.32 billion in 1965 to Rs.100 billion in 2001. This industry provides direct employment to over 2 million people in the country. 51% of leather exports originate from the southern states and 70% of tanning industries are concentrated in this region. Of the total exports from the south, Tamilnadu State alone contributes to about 90%, the value of which is Rs.50 billion. And, 75% of the tanning industries of the state are concentrated in the Palar basin, contributing to over 30% of country's total exports.

While these facts about the leather industry may appear quite heartening the reality is less so⁴. On average, 35 to 45 liters of wastewater is discharged per kilogram of raw skin / hide processed. Total quantity of water used by the tanneries in the basin works out to a minimum of 45 to 50 million liters per day; The quantity of effluent discharged from the tanneries (numbering 847), which are supposed to be connected to one of the 8 Common Effluent Treatment Plants (CETPs) installed in the Palar basin, works out to 37,458 kld or 37.5 mld. It works out to 1125 million liters per day or 13.5 million cubic meters per year. The total weight of the raw hides and skins processed works out to 1.1 million kilograms per day; for each 100 kgs of raw hides and skins processed, solid waste generation works out to 38.5 to 62 kgs; According to a study carried out by Stanley Associates (ADB, 1994) sponsored by the Asian Development Bank and executed by the Tamilnadu Pollution Control Board, pollution loads in the Palar river is extremely threatening: (all parameters are in kilograms per day) TSS: 29,938, TDS: 400,302; Chloride: 101,434, Sulphide: 3818; BOD: 23,496; COD: 70,990; Total Chromium: 474; Cyanide: 22. More than 60% of the wells in the affected villages are defunct due to water contamination; the investments that have gone into those wells are also lost permanently. Groundwater quality data collected by various government and private agencies clearly indicate very high level of contamination in this basin.

2.3 Socio-economic impact of pollution

The impact of water pollution caused due to discharge of industrial wastes is quite adverse. It affects the aesthetics of the region, wild life including birds and fish in the water bodies such as tanks and ponds, flora (a good number of habitats are destroyed due to water pollution), accumulation of pollution load in the top soil due to color and toxic effluent discharged on land, pollution of surface and groundwater bodies, decline in the quantity and quality of water available for drinking and agriculture, decline in

⁴ Most of the information provided in this section has been collected through a survey carried out during the years 1997-99 in 51 villages of the Palar basin. This was a part of the research funded by International Development Research Center, Canada.

agricultural employment and production and above all, deteriorating health conditions of human and animal population due to the use of contaminated water for drinking and other domestic purposes.

2.3.1 Impact on area, crop pattern and yield

The Soil Survey and Land Use Organization working in this region has indicated that paddy crop is affected due to poor germination, stunted vegetative growth, poor grain formation, reduced grain weight, more of chaffy grains resulting in very poor yield. Sugarcane crop's length of internodes is reduced, girth becomes very thin and the weight of cane is reduced. As regards coconut, vegetative growth of the trees is good but tender coconut water is saline; size of the nuts is reduced; falling buttons are common and in large number. Groundnut crop's leaf drying, poor root formation coupled with poor pod formation. And, for all crops, tolerance level for pest attack is reported to be reduced significantly.

The detailed sample of survey of 8 villages in the Palar basin by the present author gives more evidence on cropped area, area irrigated and on yield. Clearly, water yielding characteristics and area irrigated by wells vary between those villages, which are affected by industrial effluent and those, which are not. For instance, area irrigated per well is nil in about one-third of the sample wells (80 out of 253) in the Palar basin. The difference is quite sharp between affected and unaffected villages - 26% (41 out of 159 sample wells) in the unaffected and 41% (39 out of 94) in the affected villages. While in the unaffected villages, it is primarily due to over-use and depletion, in the affected villages it is primarily because of pollution. In most of the area coconut crop is cultivated (instead of paddy) but with very poor yield. What is worse, small operators of land who own wells, operate their wells with either poor water yields or pump a bad quality of water; whereas, the large farmers manage to sustain better by digging new wells or deepening the existing wells or both.

2.3.2 Impact on water quality

Plenty of evidence on water pollution due to leather tanneries was presented in the Second International Water Tribunal: The Tribunal discussed quite elaborately the deteriorating water quality conditions in the Palar basin. The jurists stated, *'As a result of the uncontrolled discharge of wastewater from the tanning industry both surface and groundwater have been seriously contaminated. The water is no longer suitable for drinking and has to be brought in from other areas at a price beyond the means of poor. In addition to the above, these practices, resulting in contamination with salt and chemicals, have rendered useless large areas of once fertile land'* (p220, Second International Water Tribunal 1992).

The Tamilnadu Water Supply and Drainage Board (TWAD Board) has conducted a study in 1997 collecting random samples of water along the Palar river for a distance of about 60 KM. When these results were compared with a study conducted in 1968 by the Kings Institute in Chennai it clearly indicates that TDS has increased by 79% in the

Vaniyambadi zone (upstream tannery cluster). The study also found that in the downstream the value of TDS value stood at 142%. (A Report on the Palar Pollution studies, TWAD Board, Government of Tamilnadu, 1997).

One of the major implications of water pollution in this basin is increasing scarcity for drinking water. In the past, when water contamination was minimal or unknown, the people used the local well water for all their domestic and drinking requirements. In the changing scenario, either they depend upon the public water supply system or are compelled to purchase water. The worst hits are the poor and marginal farmers and landless agricultural labourers.

2.3.3 Impact on land and land value

The detailed survey of 8 villages in this basin indicates that the value has come down drastically due to degradation of groundwater and land / soil salinity. Normally, value of land in this basin depended upon factors such as access to irrigation sources, dependability of water sources, soil quality, location of land from the head of an irrigation source and so forth. But in the affected zones of the Palar river basin, where land and water have been subject to severe pollution, the land value very much depends upon water quality and its proximity to main road and industries. Nearer the main road and cluster of industries, better the value of land. This is the type of land, which is favoured by industry owners for their industrial activities. On the other hand, the plots, which are located far away from the main road, do not fetch a good price even though quality of water is reasonable. From this, can we conclude that even though tannery effluent has contributed to severe water pollution, farmers in these villages are still better off since their lands get a better price? The answer is no because, such hike in the value of land benefits only a small fraction. Further, even those who sold their lands have gained only in the short run; our interviews confirm that most of those who sold their plots of land have instead of re-investing, have spent their money. In a few exceptional cases, properties (land) were purchased elsewhere or are living on bank interest earnings. Therefore, from the larger of perspective of environmental damages that have occurred in the village and in the region, the gains that appear to have surfaced due to hike in the land price is nothing but delusion.

2.3.4 Gains in employment and forced migration

Due to extensive employment opportunities created in the leather related activities, there has been a drastic decline in the landless agricultural labour force even in unaffected villages. The survey indicates that it is the landless Scheduled Caste population, which has gained reasonable degree of employment opportunities in the tanneries compared to others (Millie, 1998). This is the clear case of distress-induced non-farm employment because whatever prosperity the society has gained is only at the cost of severe environmental degradation, distress in agriculture, health hazards and total loss of environment and ecology for the future generation. Further, it is distress for a majority and 'prosperity' for a few.

Therefore, one of the major impacts of environmental degradation in the region is out-migration. Incidence of migration due to environmental degradation has been reported from majority of the 51 villages selected for the first round survey but the number varies according to intensity of pollution. But in two villages (namely, Gudimallur and Vannivedu), there was a bulk out-migration of 150 and 125 families respectively. These two are very badly affected villages due to tannery pollution.

The conventional – neo-classical approach suggests that the population migration is only a natural response to interregional imbalances (either due to uneven development of or uneven endowment of natural resources leading to more economic opportunities). The population movement is generally from areas where labour is plenty and capital is poor to a region where labour is less and capital is plenty. A number of push factors have been identified; the principal among them is population pressure. Other push factors are political instability, environmental degradation and lack of economic opportunities. The other approach criticizes the neo-classical paradigm. According to this approach, the macro power structure and macro structural forces, which lie at the bottom should be the explanation for population movements rather than placing too much emphasis on the free choice of individuals. (Lonergan, 1998, p.8). The government's insensitivity or lack of motivation on the one hand and the irresponsibility of the polluters (mainly industrialists) on the other or the nexus between them cause enormous damage to environment. This has a direct consequence to displacement of human population. This kind of forced movement or displacement of population from their traditional habitat causes enormous stress, distress and uncertainties in life. Thus the UNEP uses the phrase 'environmental refugees'. If these kinds of deterioration of environment are unchecked, it will directly lead to political instability, abject poverty and economic stagnation⁵.

Section 3 Conflicts in the use of groundwater and emerging deadlock conditions

In the most general sense, conflicts may be defined as 'irreconcilable interests' of individuals or groups, which are expressed in terms of hostile attitudes, or pursuing their own interests through actions that jeopardize well-being of other parties. Although conflicts may occur for a variety of reasons and in a diverse situations, in the present context we are concerned with conflicts that occur in the process of use and sharing of natural resources, in particular water. Conflicts over use of water in the developing world is more acute; in fact such conflicts take new dimensions when seen in relation with other maladies of the developing world such as poverty, hunger and malnutrition, lack of or inadequate health care, lack of protected drinking water supply, high illiteracy besides demographic pressure. In such a scenario, individual or group interests get nurtured and get more polarized due to factors such as political instability, poor governance, lack of effective law enforcement and monitoring mechanisms and so forth. This is the reflection of nothing but systemic failure.

⁵ The United Nations High Commissioner for Refugees (UNHCR), in the 1993 State of the World's Refugees, identified four root causes of refugee flows. These were political instability, economic tensions, ethnic conflict and environmental degradation' (p.1 Lonergan, 1998). Another study indicates that Environmental refugees have become the single largest class of displaced people in the world, Jacobson, 1988.

Let us take the specific case of groundwater use and abuse in the Palar river basin. Conflicts in this basin take place due to one critical factor, namely, scarcity. And, as stated earlier, scarcity in the basin has occurred due to over-use and groundwater pollution. This results in conflicting interests within rural areas which are manifested in (i) competitive deepening of wells (conflict between individual well owners), (ii) subdivision and fragmentation of wells along with land, resulting in competitive pumping and deepening even within a well (conflicts occurring between individuals within a well which are jointly owned), (iii) expansion of well irrigation resulting in drying up of traditional surface water bodies such as springs, tanks and so on (what may be called occurrence of conflicts between different natural resource base) and (iv) the differentiation of farming community into those who have own wells and those who do not (the consequence of which is the emergence of conflicts between water sellers (well owners) and water purchasers (non-well owners)). The main reason for the occurrence of conflicts in each one of these cases is the rise in the number of claimants to use this limited resource and incompatibility of interests. In particular, in a scarcity environment, when well owners exercise their unlimited property *rights* over land and groundwater, one encounters an outburst of conflicts.

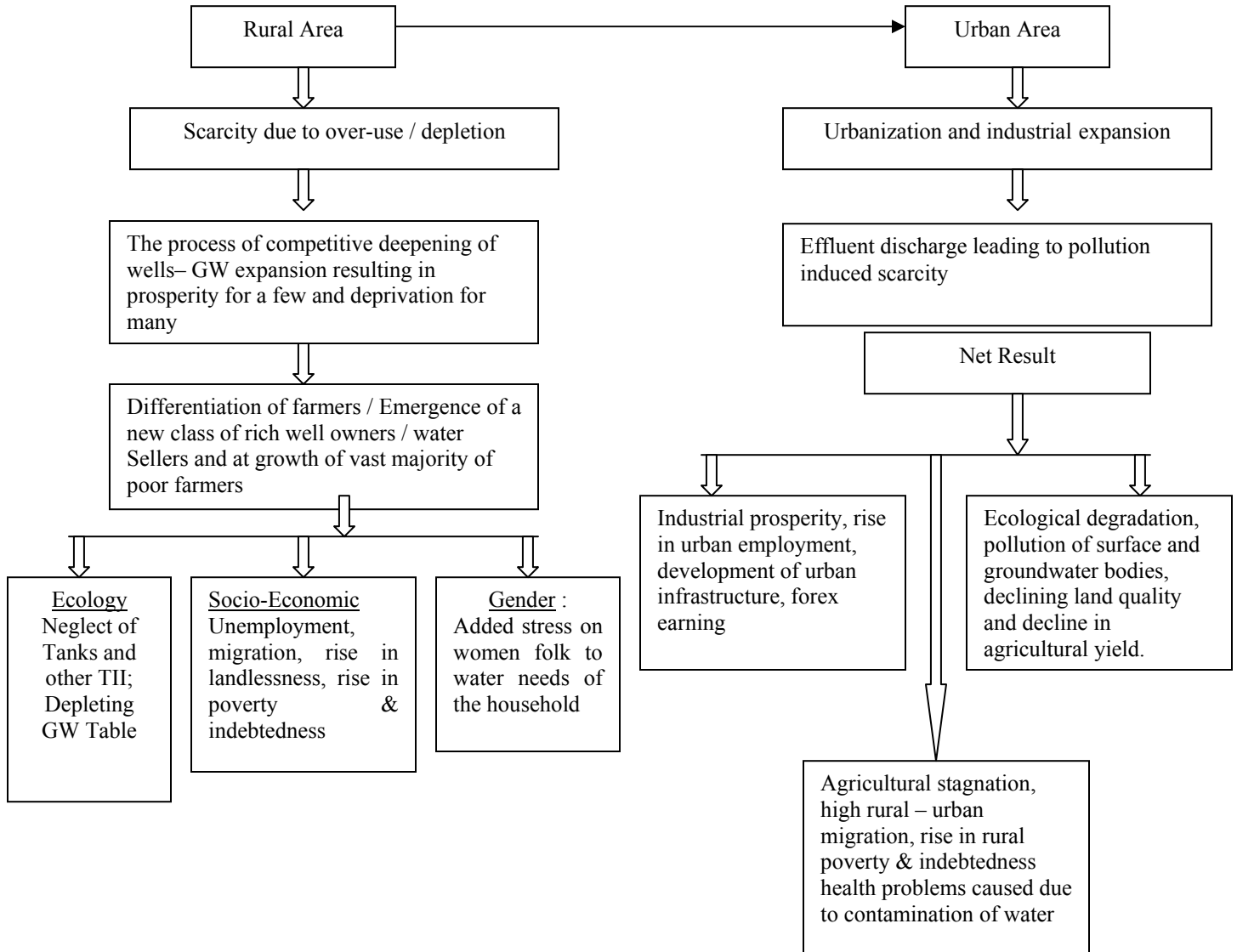
Commercial transactions in groundwater occur for non-agricultural uses also. The primary non-agricultural users are urban industrial owners and municipalities (to meet drinking water needs). Whatever quantity of water that is consumed for industrial processing is discharged as trade effluent in the open surface, streams, lakes/tanks and rivers, contributing thereby significantly to pollution load of surface and groundwater bodies. Therefore, the transportation of potable groundwater from villages to urban industrial uses not only aggravates the already depleting groundwater table, but also contributes to permanent damage to groundwater due to the discharge of industrial effluent. In many cases, the industrial owners have bought plots of land specifically with a motivation of installing deep bore wells -- beating every other well owner in the vicinity by pitching the marginal cost of well digging or deepening disproportionately high -- with a view to transporting water (this is the case in which conflicts occur between rural and urban intruding users). What's more, sand mining from the riverbed has destroyed the riverbed aquifer and the local ecology permanently. This has caused even physical conflicts as the local people's livelihood has been under severe threat⁶.

⁶ See Moreyra, Alejandra (2001) in this context who explains in a similar fashion various types of conflicts that occur in the use of water: "Increasing scarcity of water in quantity and quality generate problems related to the accomplishment of the different functions assigned to the resource. Consequently, conflicts arise among actors within the same sector (upstream and downstream irrigators), among different user sectors within the same region (irrigation, drinking water, industry etc.) and among different administrative units, that share the same watershed (municipalities, states, provinces, central governments). Conflicts of interest groups can also arise between those who consume water (consumptive users) and those who don't consume it but use it (hydro-electric power generation, tourism etc.), but also with those non-users that defend interests about the type of development they want for their locality....." (pp.4).

The flow chart, which summarizes the impacts and social analysis of these conflicts, is presented below.

Flow Chart
Social Analysis of Implications of Water Crises

Water transportation –water sale – from rural to urban



Two important questions arise here:

- What does the current water policy and water and environmental laws do?
- Do we have enough laws or do we need more?

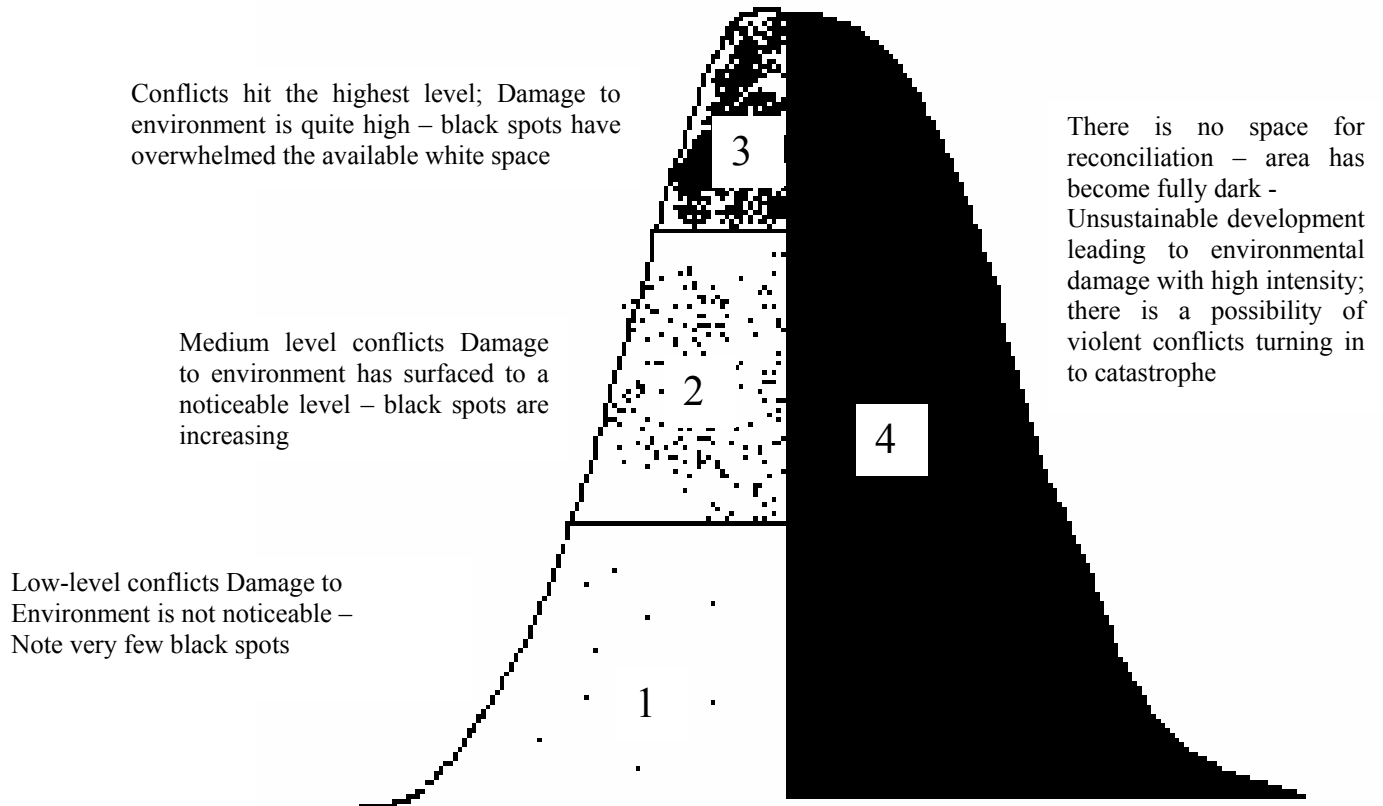
The 42nd Amendment of the Indian Constitution passed in 1974 was a landmark. This enabled a series of water and environmental protection laws, the most important of which is The Water (the prevention and control of pollution) Act. This Act enabled the constitution of Central Pollution Boards and subsequently a Board for each State. While the former functions directly under the control of the Government of India, the latter, under the control of the respective State Governments. Further, a separate ministry was created in the Central Government structure for environment and forests in 1980 as a specialized agency for planning, promoting and protecting environment.

Therefore, the institutional mechanism and water laws do exist in the country. The best example is the strong verdict given by the Supreme Court of India against the tanners of the Palar basin. The Bombay High Court has delivered a resounding judgment upholding the powers of the Central Government to issue directions or prosecute anybody who cause damage to environment. Further, the same judgment also broadened the locus standi of citizens to approach the Courts to prevent environmental degradation of any part of the country (www.goacom.com). In the recent years, the Precautionary Principle (which recommends pollution prevention rather than pollution clean-up) has become a key phrase in many verdicts of the Courts. The international environmental laws recommend several measures to combat the danger of pollution: The key measures among them are internalizing the economic costs of pollution and to adopt the 'polluter pays principle'. What is then wrong?

Dilip Biswas, the Chairman of the Central Pollution Control Board, Government of India, has confessed, 'Enforcement of such legislation is a challenging task because of various reasons including the inherent flaws in the laws and infirmity of enforcement machinery' (Environmental Legislation Challenges of Enforcement, Eastern Window E-mail, Vision 2001, p.1). He further adds that though environmental laws and specific empowered authorities have been set up for pollution prevention and payment towards compensation, monitoring and implementation mechanism is undefined. This is quite true in the case of the acute problem of pollution in the Palar basin: Leather tanneries, in the first instance, have been classified under 'red industries' category (heavily polluting industry). This warrants by law installation of treatment plants and treatment of effluent water to the prescribed standards before letting it out. This was never done for instance, in the Palar basin until the intervention of the Supreme Court through public interest litigation filed by the Vellore Citizens' Forum in 1991. At present, though many tanneries have treatment plants, the effluent water is either untreated or under-treated. In other words, the Supreme Court has delivered what is regarded as an historic verdict, but the country lacks, enforcement and monitoring mechanism, good governance and honest and committed bureaucracy. Thus even judicial activism has a limited role under the present circumstances. This is what leads to a real explosive situation. See the diagram below.

Diagram – 1

Degrees of Conflicts and sustainable development



1. Sporadic protests, uninformed civil society low media attention, Govt. incentives to industry is very high and high profits – Industry, Government, farmers and civil society think that the available space is huge and therefore never worried.
2. Affected people protest; civil society is learning; media attention is picking up but Govt. continues to give incentives to industry; high profits. The available space is getting reduced.
3. Intensive protests, attracts lots of media attention, affected people are reasonably organized, civil society is well-informed; Govt. tries their best to protect industry with subsidies to install effluent treatment plants; judiciary intervenes. The available space is very little; any reconciliatory measures should begin at least here if not in an earlier period.
4. This is a hopeless situation in which the damage to the economy, society and environment has reached an alarming proportion. Condition is catastrophic and there is absolutely no space for any reconciliation.

Before closing this section, let me explain conflicts as it occurs in different sub-systems of an economy. Water resources in any given economy may be studied in terms of three

sub-systems: They are, (A) natural sub-system, (B) user sub-system and (C) institutional sub-system.

(A) Natural Sub-system: The total water resources available in a given geographical region constitute natural sub-system or what may represent supply side of water resources. The supply side basically refers to all surface and groundwater bodies, which perform number of functions with differentiated values, for a variety of users.

(B) User Sub-system: The user-sub-system represents basically demand side. The main user agents / sectors who demand for water include user groups /sectors like agriculture, domestic and industries. Besides, future generation of users and ecosystems also have legitimate claims on the natural sub-system.

(C) Institutional Sub-system: The institutional sub-system represents basically Government or their implementing and monitoring agencies, whose primary task is to keep a balance between supply and demand. The main responsibility of the institutional sub-system is to develop water resource base, regulate its use, and enforce laws wherever necessary **and above all to maintain equilibrium between the first two sub-systems, namely, natural sub-system and user sub-system.**

The system would have a smooth sailing so long as the supply does not fall short of demand. Even if demand exceeds supply, if the institutional sub-system operates scrupulously, equilibrium may be maintained between natural sub-system and user sub-system. Under these ideal circumstances, there is no ground for any conflicts. But this is only a knife-edged equilibrium where, even a small disturbance is bound to result in conflicts. The kind of a system, which we encounter in the Palar river basin, is neither known for any state of equilibrium nor is it marginally disturbed. The institutional sub-system is ineffective, unimaginative and shady to restore equilibrium. Indeed, specific interest groups who exercise control through enormous economic and political power govern the management of the natural sub-system. The hierarchy of power is such that urban industrial owners dominate over farmers, rich farmers over poorer ones and economic expansion over ecology. In this scheme, the water and environment managers are turning out to be a mere spectators; tanners remain unshaken from their profiteering spree; social auditors keep raising their voices; but unfortunately farmers and other affected people are continued to be at the receiving end and remain as the shock-absorbers. This is the social milieu in which engaging in multi-stakeholders' dialogue (MSD) will be more useful.

Section 4

4.1 Multi-stakeholders' Dialogue as a possible policy intervention for sustainable development – The experience in the Palar basin

Multi-stakeholder dialogue is an approach, which has immense utility precisely in these kinds of deadlock situations. This approach has emerged in response to the apparent deficiency of conventional socio-economic and institutional tools. In a conflicting and in

a sort of deadlock situations over the use and abuse of natural resources, MSD approach provides an extremely useful framework and platform,

- To find ways for preventing further degradation of natural resource in question and to work towards sustainable development with a common agenda within a framework acceptable to all stakeholders;
- And, to find ways to turn situations of conflict and distrust into opportunities for mutual aid and cooperation

Ideally, stakeholder analysis⁷ will prove to be more effective and result oriented if it is carried out before launching of any project in the natural resource management. Nonetheless, in our present context, as it was already stated earlier, the tool of stakeholder analysis is applied as a step before initiating MSD. In this case, it helped to identify and gain more understanding of the stakeholders, their strengths and weaknesses, to differentiate between primary and secondary stakeholders, to single out primary conflict from secondary conflict and to strategize conflict-resolving mechanisms in the right perspective. The flow chart and the diagram presented earlier are the results my long-term research and stakeholder analysis carried out in the basin.

Social dialogue approach would not yield instant results. It is a process in which all stakeholders, though initially fight and debate, settle down after a while. What is however crucial is to sustain the tempo and interest of stakeholders until some tangible outcome emerges? The dialogue process may yield definite results under conditions, where already some threshold level of disaster has been reached. For instance, social dialogue would be more fruitful in a river basin, which is heavily used, which is dumped with industrial and domestic wastes resulting in heavy contamination of surface and groundwater, where there is severe competing demand for water, where ambiguities exists in defining water rights, where water and environmental laws are ineffectively implemented, where official monitoring system either never exists or failed and where trade offs between competing water users are ill-conceived and ill-managed. Most of all, in the particular context of the Palar river basin, even the interventions made by the highest judicial authority of the country could not make much of a difference to the severity problem. In other words, 'when everything fails' stakeholders come forward for the reconciliatory process through dialogue; until then all stakeholders compete with each other in making use of the available space. This is precisely the state of affairs in which multi-stakeholders' dialogue process was initiated in the Palar basin.

4.2 Multi-stakeholders' meeting – Some practical experiences

Probably the most direct policy impact of my research has been through the creation of an on-going multi-stakeholders' dialogue process (MSD) around critical water issues in Tamilnadu. This led to organization of the first Multi-stakeholders' Dialogue meeting of the Palar river basin in Chennai on 28th and 29th January 2002. The meeting was attended by over 120 participants including tannery owners- the main polluters - farmers, NGOs, bureaucrats, effluent treatment managers, media persons, lawyers, doctors and academics.

⁷ For a better description and understanding of stakeholder analysis see Grimble and Chan, 1995.

The basic objectives of this meeting were,

- To take stock of use and abuse of water in the Palar basin in the overall context of urban and industrial expansion and in the context of poverty, food security and hunger;
- To assess and examine who are the defaulters of law, their positive and negative contributions to society and economy;
- To bring together various stakeholders for a fruitful dialogue with a view to hear, debate, document and make public their voices;
- To find ways for preventing further degradation of water resources in the basin and to work towards sustainable development with a common agenda within a framework acceptable to all stakeholders; and, most importantly
- To find ways to turn situations of conflict and distrust into opportunities for mutual aid and cooperation

To set the stage for dialogue on the first day, a series of panelists were invited to make presentations on various aspects of water use and abuse with particular reference to the Palar basin. Altogether, various stakeholders made 12 presentations. These covered a wide variety of issues pertaining to use and abuse of water in the Palar basin. During the dialogue sessions, arguments were impassioned and lively. Initially the discussion was quite intense and one of the tanners stood up with an outburst: *'we (tanners) are treated like Afghan refugees; what sin have we committed except involving ourselves in this dirty business?'* During the afternoon of the first day, however, the variety of perspectives present was beginning to generate common points of understanding. While tanners began to acknowledge that the pollution generated by them have had huge impacts on livelihoods of the people and on the environment, farmers and other stakeholders recognized that closure of tanneries is not the solution for the problem. Mutual concerns were expressed which could be gathered from comments made by one of the tanners: *'So far we farmers and tanners) were meeting only in the Courts; for the first time we are meeting in a same platform with a view to sharing the concern'*.

In the dialogue process, remedial recourses for the problem of effluent discharge and environmental pollution were debated and discussed extensively. The dialogue centered around a series of issues, namely:

- Legal solutions: Environmental laws – Do we need new laws? Should the group consider filing public interest litigation cases – would it help the cause?
- Technical Options: Can we use technologically more efficient individualized or centralized effluent treatment plants (IETPs and CETPs)? Would it be possible to use cleaner technologies in the tanning process or recycle the treated water? If we argue for more effective technologies, do we have an efficient monitoring mechanism to ensure they are actually implemented?
- Governmental Options: Could individuals or groups put pressure on the Loss of Ecology Authority to take action to reverse existing ecological degradation. If pressure were exercised, would the Authority really be able to do anything?

Towards the end of the meeting there was a big sign of relief. At that time it was widely acknowledged that MSD is a process and not a one-off meeting. Therefore, there was a general agreement to form a Committee from among those who were present so that the dialogue process could be carried further. **The result was the birth of the *Multi-Stakeholders' Committee* with 24 members represented from different stakeholders.** This meeting was given a very wide publicity for two days by both print and visual media.

4.3 Formalizing the Multi-stakeholders' Committee of Water Users of the Palar River Basin

Following the first MSD meeting, individuals participating in the committee have been working to define their objectives. At least initially, the members have agreed that the objectives of this Committee will be the following:

- (i) To make a comprehensive attempt with an inter-disciplinary focus to document water and environmental issues in the Palar basin. In particular, the Committee will spend considerable time in water audit.
- (ii) To monitor pollution levels in the surface and groundwater at different strategic points within the basin
- (iii) To measure the quantum of water consumed by different sectors such as agriculture, industrial and domestic users;
- (iv) To measure and monitor the quality of water at various inlet and outlet points from industries
- (v) To measure the actual quantum of water that goes out of the basin for non-agricultural uses such as for domestic and industrial purposes, amusement parks etc.
- (vi) To develop a package for reversing ecological degradation in the basin: As currently envisioned, this package will involve: Revamping of traditional irrigation sources such as tanks and springs as a measure of providing adequate irrigation water as well as to recharge groundwater; channeling water into the Palar River in order to increase water flow; preventing sand mining; Preventing polluted water (both from industries and from domestic sewage) from entering the river – whether treated or untreated; removing encroachments in the Palar River; suggesting cleaner technology for water treatment; developing a rapport with various government agencies; critically assessing the findings of the Loss of Ecology Authority and their recommendations for ecological restoration.

In order to carry out these responsibilities, it was agreed to appoint / consult experts in various fields.

Major Outcomes of the Committee's Deliberations

The State Government has constituted what is called 'The Palar Basin Board' at the recommendation of the World Bank in 2001. This Board so far had met only once and

no business seems to have been transacted. Whereas our Committee has already met seven times so far during the past two years and has identified and addressed the following critical policy issues:

(1) The Committee has unanimously agreed that the closure of tanneries is not the solution; the members have committed themselves for finding solutions not only for pollution but also for restoring the ecology of the basin. (2) Different stakeholders have agreed to share information among themselves so that more useful and concrete decisions can be made; in particular, tanners who hitherto were denying any access to information, have agreed to share with all the details pertaining to tanneries and CETPs and also have agreed to open access to tanneries and CETPs with a view to enabling the Committee members to visit their sites at any time. This is considered one of the best positive outcomes of the Committee in a short span of time. (3) It was felt that the prevention of any further pollution in the basin is the first step required towards ecological restoration. (4) The Committee explored a variety of specific potential solutions to some of the most critical water problems. These include the possibility of (a) handing over of effluent to a private water treatment company and pay according to the services provided by them and (b) the use of mobile cold storage system to collect and transport raw hides and skins from all over the country so that pickling process could be avoided (which is the main source of TDS (salt) accumulation in the effluent. (5) One of the main objectives of the MSD meeting were to bring together various stakeholders for a fruitful dialogue with a view to hear, debate, document and *make public their voices*. With a view to fulfilling this objective, the entire two days' proceedings were recorded and transcribed. Thus, the entire proceedings of the dialogue meeting along with a long introduction on conditions of river basins in Tamilnadu have already been published in Tamil (local language). The book has a length of 270 pages with photographs. The Governor of Tamilnadu released the book on 26th December 2003, which again received a wide publicity in the print and visual media.

Looking into the future -Leftover tasks

Despite its considerable successes during the first year, many tasks identified by the Committee remain underway. These include:

- Developing rapport with the Government agencies at all levels with a view to (a) getting access to official information (database), (b) influencing the policies of the Government and (c) executing objectives of the Committee with the endorsement and financial support of the Government.
- Generating data on all aspects of the basin – both primary and secondary
- Developing village-level stakeholder units with the objective of (a) spreading awareness for the restoration ecology in the basin, (b) generating primary data in each village concerning crop details, water use, conditions of surface and groundwater bodies, ground water levels, water quality characteristics, documenting water conflicts, documenting details relating to encroachments, and so on, (c) developing a monitoring mechanism for preventing further pollution, to regulate water use (both surface and groundwater), and (d) to regulate water markets. The activities of village-

level stakeholder units would need official sanction from the Social Committee only to prevent any unlawful activity of the stakeholder units.

- To sustain the MSD process through periodic Stakeholder Committee meeting

Conclusion

One of the biggest challenges in the current Indian context is to meet the growing water demand of various sectors such as agriculture, industries, urban drinking water needs and to maintain ecology and environment. There exists a virtual competition between these sectors, which often results in conflicts. There is a greater need to prevent overuse and degradation of water due to pollution. In particular, sectors such as industries and domestic water users (municipalities) are primarily dependent upon water supply from rural areas; but what is turned out after use is deadly untreated wastewater, which gets dumped in rivers, streams, ponds and tanks, wastelands etc. This contributes to severe water contamination - both surface and sub-surface. Palar is one such typical –heavily stressed river basin where leather tanneries have played a significant role in contributing to the environmental degradation in general and water pollution in particular. Existing policy initiatives have failed to deliver goods; there were several concerted efforts to express public solidarity; but the political parties in the State, with one or two exceptions, did not take active interest in the public outrage nor did they make it an election issue; even after assuming power the successive elected governments in the State never made any concrete efforts to resolve the issue . Judicial activism - through the Supreme Court's intervention - in response to the public interest litigation case filed against tanners was helpful in so far as creating awareness and in pronouncing what tanners have done to the environment is an offence. But the remedial measures suggested by the Court could not travel too far due to fundamental flaws in the law enforcement and monitoring mechanisms. It was at this juncture the MSD process was initiated in the basin, which appears rewarding at the moment. In the absence of any other alternative solution to the vexed problem of pollution in the basin, the MSD process helps at least to bring together all stakeholders in the basin for a negotiated settlement; its success very much depends upon the active support that it deserves from the State and Central governments.

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