GOVERNING WATER POLLUTION EFFECTIVELY: A COMPARATIVE STUDY OF LEGAL FRAMEWORKS & THEIR IMPLEMENTATION IN INDIA & SWEDEN

Dissertation Submitted in partial fulfillment of the requirements of the
DEGREE OF MASTER OF LAWS
under the supervision of

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June 2011

DECLARATION

I, Kumar Abhijeet do hereby declare that this dissertation *"Governing Water Pollution Effectively: A Comparative Study of legal Frameworks & their Implementation in India & Sweden"* has been carried out by me in partial fulfilment of the Master of Law Degree of the NLSIU, under the supervision of Prof. M. K. Ramesh at the National Law School of India University.

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CERTIFICATE

This is to certify that this dissertation *"Governing Water Pollution Effectively: A Comparative Study of legal Frameworks & their Implementation in India & Sweden"* by Kumar Abhijeet, for the degree of Masters of Laws of the National Law School of India University is the product of *bona fide* research, carried out under the guidance and supervision of Prof. M. K. Ramesh.

Prof. M. K. Ramesh
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Acknowledgement

It is a pleasure to thank all those people who contributed to make this thesis see the light.

I owe my deepest gratitude to my supervisor Prof. M. K. Ramesh whose constant encouragement and guidance has helped me to pen down this thesis.

I am obliged to all those resource persons who spared precious time from their busy schedule to discuss with me share their thoughts on the topic.

I am thankful to NLSIU library members who gave their immense cooperation throughout this endeavor. I also thank to Linnaeus- Palme academic exchange programme which took care of my research expenses at Sweden.

I am grateful to my parents, my sisters and friends who are integral part of my life and have continuously given me all possible help and support.

Lastly I offer my sincere regards to all those who have supported me in any respect during the completion of my thesis.

1. INTRODUCTION

For the survival of human beings and most other terrestrial animals fresh water is fundamental there is no substitute to it. Ninety seven per cent of the earth's water is the salt water of oceans and seas. Most of the remaining 3 per cent is in polar ice caps, glaciers, the atmosphere or underground and hard to reach. Only 0.4 per cent is available for use. Growing population, increased economic activity and industrialization has resulted in an increased demand for fresh water and more discharge of untreated water into streams, rivers, lakes. The rapid urbanization has further accelerated rapid diminishing and detoriation of water resources. The water bodies can no longer cope with the increasing pollution load.

The developing countries in the world are the common victims of contaminated water because they have little infrastructure to deal with sewage and other water sanitation issues. According to the United Nations it is estimated that developing countries dump ninety-five percent of their untreated urban sewage into the same lakes and rivers they use for drinking and bathing. As a result water borne disease and death is likely.

India is a vast country with varying geographical and climatic condition. There are water surplus region as well water scarce region. Certain states and region are blessed with rivers and lakes whereas certain others are prone to draught and floods. India's huge and growing population is putting a severe strain on the exiting water resources of the country. Most water resources are contaminated by sewage and agricultural runoff. There exists gross disparity in clean water from one region to another or even at different locations in the same region. According to the World Bank estimates twenty one percent of communicable diseases in India are related to unsafe water. Despite the longstanding efforts by the government and community access to clean water remains unsatisfactory.

The poor management of a resource makes the resource further poor. Thus effective management of the resources becomes crucial. Good governance has been vital in conservation of a resource. But the issue is what constitutes good governance with respect to water? Law has always played a steering role in governance aspect. But despite having pollution control laws the effective governance of water pollution has not been attainable. Are the pollution control laws fundamentally wrong or some other factors prevail which is beyond the reach of law to control the pollution problem. Experience has shown that it

is within the reach of our limits to slow and reverse water quality degradation. The challenge before us is how effectively we manage the governance of water which best serves the present and future generation.

Sweden has been a pioneer in the field of setting standards for environment quality. Though Sweden is rich in water resources still it is concerned in enhancing the water quality so that the future generations live in a more a healthy environment and the existing stock last longer. Since the first International environmental conference on the Human Environment, held at Stockholm from 5 to 16 June 1972, Sweden has been striving to achieve common principles to inspire and guide in the preservation and enhancement of the human environment. The 2010 Environment Performance Index prepared by Yale Centre for Environmental Law and Policy ranks Sweden at fourth position and India at the one twenty three position amongst the 163 nations of the World. This makes one think how has Sweden been able to achieve this status? Is it because the environmental laws in Sweden are good or is it just effective implementation of the laws or both. At this stage researcher has his hypothesis that the Indian Legal system has failed to govern water pollution effectively.

The thesis has been divided into four parts. The first parts deals with the theoretical framework with regard to water governance. The second part is the study of legal regime governing water pollution and their implementation in India and Sweden. The third part covers comparative analysis of India and Sweden. Discussion, conclusion and suggestion have been covered in the last part of my thesis.

1.1. Aim

The aim of the research is to make a comparative study of legal frameworks governing water pollution & their implementation in India & Sweden.

1.2. Objective of the study

The objective of study is

- To understand what effective governance constitutes.
- To understand how water pollution can effectively be governed.
- To study the role of law in water governance

- To study the legal system and their implementation for control of water pollution in India & Sweden.

1.3. Methodology:

Though the researcher prima-facie relied on the secondary source of information and adopted doctrinal method of research but experts working in the field of water were also personally communicated in India and Sweden. Also person's in- charge of control of water pollution in Sweden were personally interviewed. The approach is critical and analytical.

For the understanding of water pollution problem a couple of case studies have also been done from Hyderabad and Kerala. Hussain Sagar Lake, Hyderabad is an ancient artificial lake constructed for drinking and irrigation purpose in the 15th century. Today the lake is no more used for drinking purpose because of the pollution. The plight of such heritage resource has provoked me to make study why has the legal regime not been able to conserve it. Similar inspiration I had by seeing the dead fishes in the river Periyar, Kerala. If the rule of law is to prevail such disastrous play with the nature cannot be accepted.

1.4. Limitations:

Though the researcher has intended to do a comparative study of legal frameworks & their implementation in India & Sweden, however the study is largely limited to the legislations available in English language only.

2. THEORETICAL FRAMEWORK

2.1. Governance

Governance is not new but an age old concept. As early as 400 BC, Kautilya[1] in his book *Arthashastra*[2] recognised justice, ethics, and anti-autocratic tendencies as key to the "art of Governance". He identifies the duty of the king to protect the wealth of the state and its subjects and to enhance, maintain, and safeguard this wealth as well as the interests of the kingdom's subjects (Penguin, 1992). Despite the long provenance of the concept, no strong consensus has formed around a single definition of governance or institutional quality (Kaufmann & Kraay, 2008) .

[1]Thought to be the Chief Minister to the King of India during 400 BC.
[2]A treatise to Governance.

"Governance means the process of decision-making and the process by which decisions are implemented (or not implemented)".Various organizations have defined governance in its own way. The Commission on Global Governance (1995) defined the concept as ". . .the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest". The governance definition of the United Nations Development Programme conceive it as economic, political and administrative process through which citizens and various groups can articulate their interests, exercise their legal rights, meet their obligations and mediate their differences (UNDP, 2004).

"Governance in a society, at the national or community level can be depicted as the relationship between sectors or partners in the context of the traditions, values and history that characterize that society. Governance determines who has power, who makes decisions, how other players make their voices heard and how account is rendered" (Institute of Governace). Figure 1 explains this concept. The term refers, in general, to the relationship (economic, social and political) between a society and its government, or between an organization and its governing entity. Governance is often referred to as the art of steering societies and organizations (Institute of Governace) . Thus a number of formal and informal actors are involved in governance and government is just one of the actors of governance.

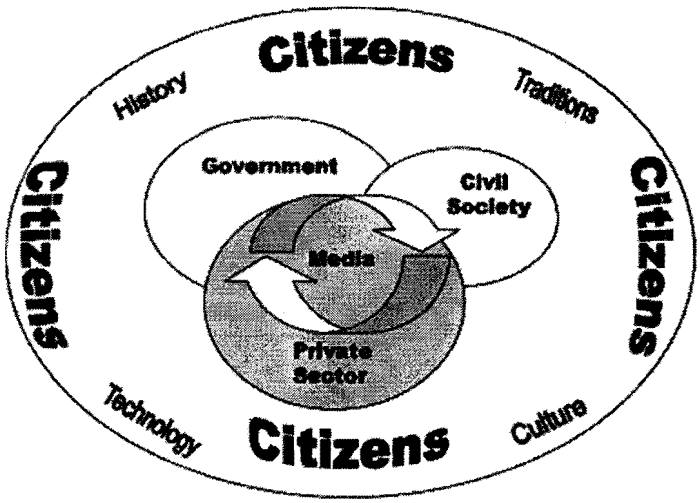

Figure 1 various Actors in Governance
Source: (Institute of Governace)

2.1.1. Good Governance

For the success of any endeavor 'Good governance' is an essential factor. It is rather means than an end to achieve the endeavor. In this regard law is also not untouched with it for its effective implementation. "Good governance is about both achieving desired results and achieving them in the right way. Since the 'right way' is largely shaped by the cultural norms and values of the organization, there can be no universal template for good governance. Each organization must tailor its own definition of good governance to suit its needs and values" (Institute of Governace).

Good governance:

- Promotes trust in the organization and its people;
- Improves morale among staff and stakeholders;
- Enhances services to the public and stakeholders;
- Improves decision-making and the quality of these decisions;
- Connects your organization - and its Board - to its membership and stakeholders;
- Enhances the perception of the organization among people and stakeholders;
- Improves the ability to weather a crisis;
- Improves financial stability.

2.2. Water Governance

Water governance has been defined as ". . .the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society" (Global Water Partnership, 2002). Simply put water governance is who gets water, when and how (Morlorty, B., et. al. , 2007). Delivery of water cannot be without control of water pollution. Hence governing water pollution effectively becomes important in this regard.

Governance in water sector must be perceived as a subset of a country's general governance system of how various actors relate to each other (Rogers & Hall, 2003). Despite alternative approaches to defining new forms of governance, some similar features can be discerned (Tropp, 2007):

- Governance is seen as a process of interactions rather than as a formal institution/regime.
- Governance is based on accommodation rather than domination decision-making is increasingly based on negotiations, dialogue and networking.
- Governance provides alternatives to top-down hierarchy, such as through horizontal networks.
- Governance includes both private and public sectors and the interactions and relationships between them are critical for governance outcomes.
- Governance is action-orientated (governance for the common good or for solving common problems) and appears at all scales, from local to global.
- Authority is still considered important but it does not necessarily take the form of government authority.
- There is an emphasis on relationships, networks and organisation of collective action.
- Governance looks to flexibility and informal institutions that often escape formal government structures, for example networks.

2.2.1. Principles of effective water governance

Roger and Hall (2003) have identified five principles to effective water governance.

Open and transparent:

Institutions are supposed to work in an open manner. The language used by them should be friendly to the general public. This creates trust in the mind of people. Institutions should work in an open manner. Besides being open, good governance requires that all policy decisions are transparent so that both insiders and outsiders can easily follow the steps taken in the policy formulation.

Inclusive and communicative:

From conception of a policy to their implementation a wide number people are involved whose interested are to be taken care. This could best be taken care by making them participate in policy making. Improved participation is likely to create more confidence. Broad participation is built on social mobilization and freedom of association and speech, as well as capacities to participate constructively. Transparency and accountability are built on the free flow of information. Governance institutions and systems need to reduce the communication gap among the actors and stakeholders. This will lead civil society to participate into governance over a wide range of issues.

Coherent and integrative:

Policies and action must be coherent. Coherence requires political leadership and a strong responsibility on the part of the institutions at different levels to ensure a consistent approach within a complex system. The institutions will have to consider all uses and users within the traditional water sector and also their interconnections with and impacts upon all other potential users and sectors.

Equitable and ethical:

All men and women should have opportunities to improve or maintain their well-being. Equity between and among the various interest groups, stakeholders, and consumer-voters needs to be carefully monitored throughout the process of policy development and implementation. Water governance has to be strongly based upon the ethical principles of the society in which it functions and based on the rule of law. Legal and regulatory frameworks should be fair and enforced impartially.

Accountable:

There is a need for greater clarity and responsibility from all those involved in developing and implementing policy at any level. The "rules of the game" need to be clearly spelled out, as should the consequences for violation of the rules, and have built-in arbitration enforcing mechanisms to ensure that satisfactory solutions can still be reached when seemingly irreconcilable conflicts arise among the stakeholders. Decision-makers in government, the private sector and civil society organizations are accountable to the public, as well as to institutional stakeholders.

Efficient:

Efficiency in governance not only refers to economic efficiency, but also political, social, and environmental efficiency.

Responsive and sustainable:

Policies must deliver what is needed on the basis of demand, clear objectives, an evaluation of future impact and, where available, of past experience. Responsiveness also requires policies to be implemented in a proportionate manner and decisions to be taken at the most appropriate level. The policies should be incentive-based. This will ensure that there is a clear social or economic gain to be achieved by following the policy. The institutions should also be built with an eye toward long-term sustainability. Water governance must serve future as well as present users of water services.

2.3. The Integrated Water Resource Management (IWRM) Approach

All form of water i.e surface, ground water, rivers... and water users are interrelated to each other in one way or the other. A sectoral approach to the management of these resources is no more desirable. The IWRM is an approach evolved to amalgamate all sectors related to use of water. The basis of IWRM is that different uses of water are interdependent and hence considered together. It is "... a comprehensive approach... a process which promotes the coordinated development & management of water, land & related resources in order to maximise the resultant economic & social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (Global water Partnership, 2000).

2.3.1. *Principles of IWRM*

The Principles (Dublin Principles, 1992) of integrated water resource management are

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels.
- Women play a central part in the provision, management and safe-guarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good as well as social good.

2.3.2. *Why IWRM?*

With the increase in population the pressure on water resources is increasing. Lack of safe and affordable drinking water and basic sanitation, pressure from national economic sectors like energy and agriculture due to lack of water for development, trans boundary conflicts and crisis and international agreements on water are randomly ascending. In such situation it is inevitable for governments to initiate processes leading to improved management of water resources. Such improvements can be achieved through Integrated Water Resources Management (Jønch-Clausen, 2004). IWRM is a means, of achieving three key strategic objectives (Dublin Principles, 1992).

- efficiency to make existing water resources everlasting
- equity, in the allocation of water across different social and economic groups;
- environmental sustainability, to protect the water resources base and associated eco-systems.

With the regard to control of water pollution it becomes important to manage all resources collectively and co- operation among various water sectors becomes absolutely necessary and hence IWRM could be a tool to govern water pollution effectively.

2.4. Expectations from an effective legal system

The expectation from any legal system can be best explained in term Hohfeldian analysis. A legal system is expected to describe the rights and duties of an individual so that institutions function within the four corners of its defined power structure. It is general

myth that the law can solve all the problems, although law does solve the problem to a great extent.

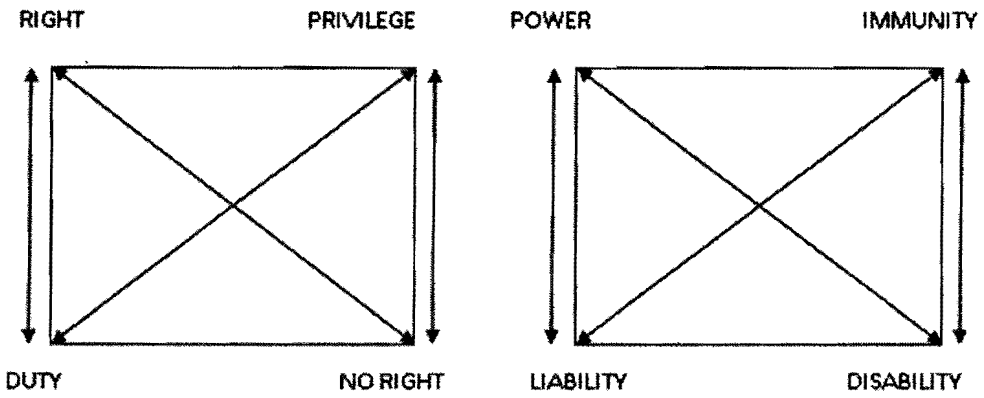

Figure 2: Hohfeld Analysis

Right and duty are the correlative terms whereas power and liability are the correlative terms. Similarly privilege & no right and immunity & disability are respective co – relatives. To explain the concept let us take the example of right to quality drinking water. If a person has the *right* to quality drinking water then it is the *duty* of the State to provide pollution free safe drinking water. If the agriculture sector has a *privilege* of water subsidy then other sectors have *no right* when a privilege has been given to agriculture.

If the pollution control board has the *power* to establish the standards for water quality then the industries have the *liability* to meet those standards. The board officials have *immunity* with regard to acts done in good faith and then the citizens have *disability* to take actions when the acts have been done in good faith.

On governance of water pollution, law must look at the Rights, institution building and standards. A water pollution control law must well define the rights of a citizen. What are the standards and norms required to be followed. Who has to take action in case of breach of norms and what actions are to be taken? All these have to be defined within the powers of the institution in charge of control of pollution. For having effective implementation of such well-defined law, the law making process itself has to follow certain methodology.

2.5. Law making as process.

Hydén and others (2006) have divided law making into six steps. "The first step is to empirically and theoretically produce knowledge of the conflict underlying a specific law making mater. The second step is to make out how politics grasp the conflict balancing different interests and forming policy strategies. Thirdly policy is given a legal form to be analyzed in terms of different types of legal norms. To make law matter in social life, agencies for judicial application are needed. Analysing how these are organised, their qualifications and prospects constitutes the fifth step of analysis. The sixth is to empirically survey the consequences of the legal implementation and finally relate these to whether the conflict of interests has been affected or not."

Thus in order to have an effective implementation of water pollution control law foresightedness is necessary. The problem associated with it, interest of stake holders, who is the agency in charge for its implementation ... all other likely aspects has to be anticipated before the law comes into force. Also standards set should not be too harsh. It has to be in the interest of public. An unjust law is no law and invites public distrust and agitation.

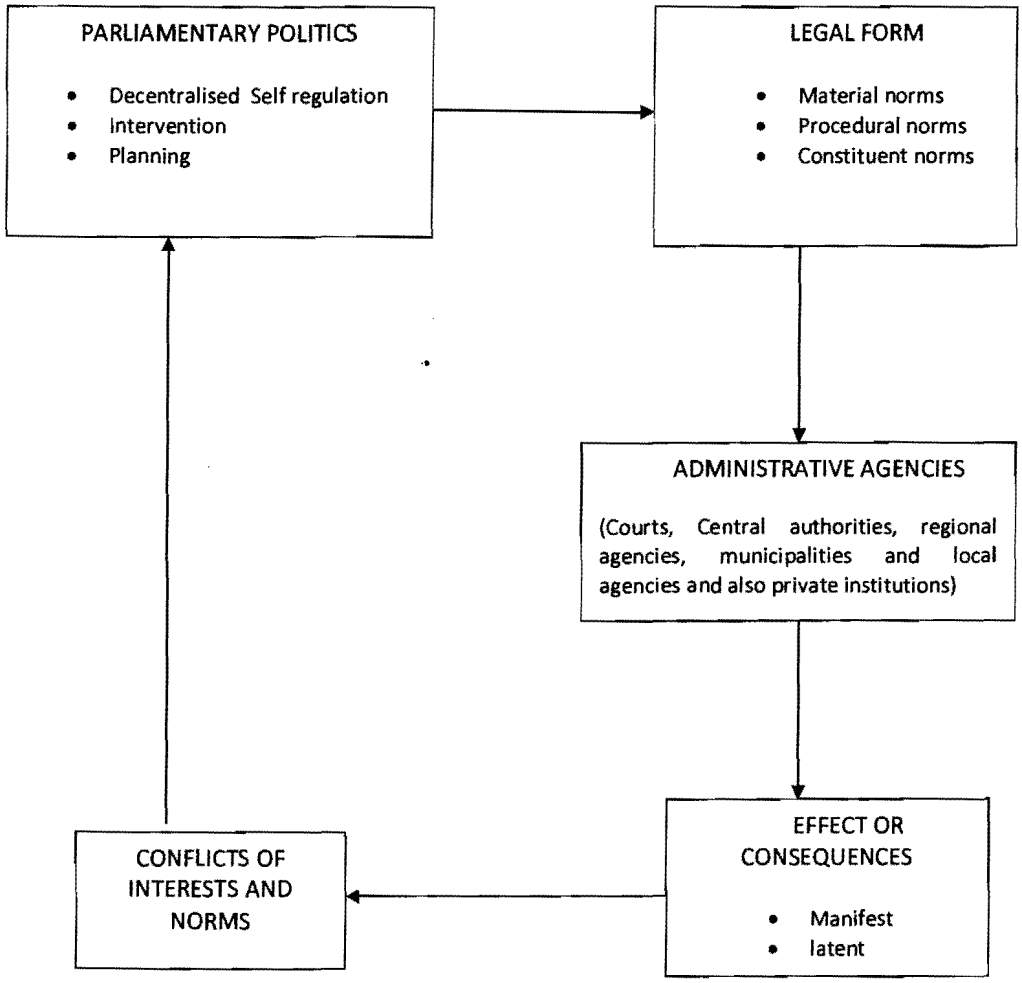

Figure 3: Model of Law making Process.
This model was first developed by Hydén, H., U. Stridbeck and Åström, K. in 1980.

3. THE INSTITUTIONAL SET UP TO CONTROL WATER POLLUTION IN INDIA

3.1. The Constitutional scheme

To prevent and control the pollution of water is constitutional mandate. The Indian constitution contains specific provisions for the protection of environment under the chapters of Directive Principle of State Policy and Fundamental Duties and by virtue of judicial activism even in the chapters of fundamental rights.

3.1.1. Duty of the State to provide healthy environment

Article 48A of the Constitution imposes a duty on the state to protect and improve the environment. A similar responsibility is imposed on every citizen in the form of fundamental duty "to protect and improve the natural environment including forests, lakes, rivers ... (Article 51(A)(g))" The directive of Art. 48A requires the State not only to adopt a protectionist policy but also to provide for the improvement, of polluted environment. The phrase "protect and improve" contemplate affirmative governmental action to improve the quality of existing water resources and not just to preserve the water resources in the degraded form. In *General Public of Saproon Valley* the Himachal Pradesh High Court described Art. 48 as "Constitutional pointer to the State not only to protect but also to improve the environment (and)... failure to abide by the pointer is nothing short of a betrayal of the fundamental law which the State is bound to uphold".

Further the duty has been imposed on the State under Article 47 of the constitution to provide safe drinking water to the people, as the standard of living and public health cannot be raised in absence of equal and adequate access to safe drinking water by all. It is also the duty of the state to distribute the ownership and control of material resources, water being the most important of such resources (Khare, 2006), to achieve the maximum good of the largest number (Article 39 (b)).

3.1.2. Right to water - Fundamental right

The right to water has been recognized as the fundamental right under Article 21 of the constitution. The Apex court of India in *Subhash Kumar v. State of Bihar* declared that the right to pollution free water, is part of the right to life, guaranteed under article 21. In *Indian Council for Enviro - Legal Action v. Union of India* the Supreme Court held that it has power and duty to intervene and protect right to life of citizens, when an industry is established without obtaining the requisite permission/ clearances and is in continued to be run in blatant disregard of law to the detriment of life and liberty of the citizens living

in the vicinity. While interpreting article 21, in the *Ganga Pollution case*, Justice Kuldeep Singh justifying the closure of tanneries observed: "we are conscious that closure of tanneries may bring unemployment, loss of revenue, but life, health and ecology have greater importance to the people".

3.1.3. Water as a State subject

Article 246 of the Constitution divides the subject areas of legislation between the Union and the States. Under the Constitution of India 'water' is put under in the state list[3] which means the legislature of the state have the exclusive power to make laws in respect of any of the matters relating to water. According to Part IX of the Constitution read with Schedule XI, the Panchayats have been vested with the power to legislate upon the matters relating to minor irrigation, water management and watershed development.

3.1.4. Constitutional remedies

The Writs

Writ petition can be filed to the Supreme Court of India under Art. 32 and the High Court under Article 226, in case of a violation of a fundamental right. Since the right to a wholesome environment has been recognized as an implied fundamental right, the writ petitions are often resorted to in environmental cases.

Generally, writs of *mandamus, certiorari* and *prohibition* are used in environmental matters. For instance, a *mandamus* (a writ to command action by a public authority when an authority is vested with power and wrongfully refuses to exercise it) would lie against a municipality that fails to construct sewers and drains, clean streets and clear garbage *(Rampal v. State of Rajasthan).* Likewise, a state pollution control board may be compelled to take action against an industry discharging pollutants beyond the permissible level.

The writs of *certiorari and prohibition* are issued whew an authority in excess of jurisdiction, acts in violation of the rules of natural justice, acts under a law which is unconstitutional, commits an error apparent on the face of the record, etc. For instance, a writ of certiorari will lie against a municipal authority that considers a builder's application and permits construction contrary to development rule e.g. a pollution control board that wrongly permits an industry to discharge effluents beyond prescribed levels.

Public Interest Litigation (PIL)

[3]Entry 17, List II, Seventh Schedule.

In recent times the courts in India have tried to overcome the limitations associated with a procedure. Traditional rule of *locus standi* is that only a person who was aggrieved was entitled to seek a remedy. The Supreme Court, in recent times has permitted modifications in this traditional rule of standing. Under the public Interest Litigation any member of the public may come forward to initiate action for the protection of the interest of public at large. In environmental cases PIL has emerged as a boon. The leading environmental cases decided by the Supreme Court, which have resulted in the closure of limestone quarries in the Dehradun region *Dehradun Quarrying, case,* the installation of safeguard at a chlorine plant in Delhi (*M. C. Mehta v. Union of India,*) and the closure of polluting tanneries in the Ganga (*M.C.Mehta v.Union of India*), fall within the category of PIL cases.

3.2. The Statutory protection

Under the Indian legal system it is difficult to find one comprehensive law for the control and prevention of water pollution. The major statutes for addressing water problems are:

1. Water (Prevention and Control of Pollution) Act of 1974
2. The Water (Prevention and Control of Pollution) Cess Act of 1977
3. Environment (Protection Act) of 1986 relating to water quality

In addition an action plan for the prevention of pollution of the river Ganga has been adopted. The High Courts and Supreme Court of India has also played a significant role in the prevention and control of water pollution in India.

3.2.1. Water (Prevention and Control of Pollution) Act of 1974

The Water Act of 1974 is the first attempt to deal comprehensively with control and prevention of water pollution. Though water is a subject in the State List, Article 252(1) of the Constitution, empowers the Union Government to legislate in a field of state subject, where two or more State legislatures consent a central law. By virtue of this Constitutional scheme the water Act of 1974 came into existence.

The main objectives[4] of the act is

- To provide for the prevention and control of water pollution;
- To maintain or restore wholesomeness of water;
- To establish pollution control boards and

[4] See Preamble to the Water Act.

- To confer on pollution control boards power and functions relating to prevention and control of water pollution.

For the prevention and control of water pollution the Act establishes a Central and State pollution control boards. Section 16 of the act has described the powers of Central pollution Control boards (CPCB) in detail. The main function of the CPCB shall be to promote cleanliness of streams and wells in different areas of States. Apart from this the CPCB may perform all or any of the following functions:

- Advise the Central Government on any matter concerning prevention and control of water and air pollution and improvement of the quality of air.
- Plan and cause to be executed a nation-wide programme for the prevention, control or abatement of water and air pollution;
- Co-ordinate the activities of the State Board and resolve disputes among them;
- Provide technical assistance and guidance to the State Boards, carry out and sponsor investigation and research relating to problems of water and air pollution, and for their prevention, control or abatement;
- Plan and organise training of persons engaged in programme on the prevention, control or abatement of water and air pollution;
- Organise through mass media, a comprehensive mass awareness programme on the prevention, control or abatement of water and air pollution;
- Collect, compile and publish technical and statistical data relating to water and air pollution and the measures devised for their effective prevention, control or abatement;
- Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts;
- Disseminate information in respect of matters relating to water and air pollution and their prevention and control;
- Lay down, modify or annul, in consultation with the State Governments concerned, the standards for stream or well, and lay down standards for the quality of air; and
- Perform such other function as may be prescribed by the Government of India.

Similarly the functions of State pollution control boards have been defined under Section 17 of the Act. Though the act does not prescribe the standards for the discharge of effluent or the quality of the receiving water but it empowers state boards to set these standards [5] (Divan & Rosencranz, 2001) The other functions of the SPCB is

- Planning a comprehensive programme for the prevention, control and abatement of water pollution in the state;
- Encouraging, conducting, and participating in investigations research of water pollution problems;
- Inspecting facilities for sewage and trade effluent treatment;
- Developing economical and reliable methods of treatment of sewage and trade effluents.

Powers of the Central Government

The Central Government is empowered by S.18 of the Water Act to give directions in writing to the CPCB with respect to the carrying out of the functions. Such directions are binding on the CPCB. The CPCB may in turn give directions to the State Pollution Control board and shall have a binding effect. If the SPCB has defaulted in complying with the directions given by the CPCB and as a result of such default a grave emergency has arisen, the Central Govt. may direct the CPCB to perform any other function of the SPCB in relation to such area for such period and for such purpose as may be specified in the order.

The central government is also empowered to supersede the Central Board for such period not exceeding one year, if at any time the Central Government is of opinion that the CPCB has persistently made default in the performance of the functions prescribed under the Water Act or that the circumstances exist which render it necessary in public interest to do so[6].

Such a wide power in the hand of Central Government is a double edged sword and if not exercised judiciously may adversely affect the environment. The *Span Motel case (M.C. Mehta v. Kamal Nath)* is a classic example in this regard.

[5]Section 17(g). The Environment (Protection) Act of 1986 gives the Central Government similar authority to establish water quality and effluent standards throughout India.
[6]Section 61 of the Water Act, 1974.

In 1995, Span Motels built a resort on the bank of the river Beas in Himachal Pradesh. This construction was validated in 1993-94, during the tenure of Kamal Nath, the then Union Minister for Environment and Forest. A massive destruction to quality of river was caused by such construction.

The Supreme Court of India relying on US Court decisions[7] struck down the orders. The court relied on the Public trust doctrine and held the role of State with regard to public property is of a trustee. State cannot appropriate such property for individuals benefit.

According to Joseph L. Sax, Professor of Law, University of Michigan the public trust doctrine imposes the following restrictions on governmental authority:

i. The property subject to the trust must not only be used for a public purpose but it must be held available for use by the general public;
ii. The property must not be sold, even for a fair cash equivalent; and
iii. The property must be maintained for particular types of uses.

Thus the Central Government being trustee of natural resources must act judiciously when exercising its powers granted by the water Act.

3.2.2. The Water Cess (Prevention and Control of Pollution) Act of 1977

The Water Cess (Prevention and Control of Pollution) Act 1997 was enacted to meet expenses of Central and State Boards. The Preamble to the Act reads: An Act to provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Boards and the State Boards for the prevention and control of water pollution constituted under the Water Act, 1974.

The Act requires the local authorities and certain designated industries (listed in Schedule I of the Act) to pay a cess (tax) for water consumption. The Act gives the polluter a seventy per cent rebate of applicable cess upon installing the effluent treatment equipment.

The industries and local authorities are subject to cess if they use water for purposes listed in Schedule II of the Act, which include: (1) industrial cooling, spraying in mine pits, or boiler feed (2) domestic purposes (3) processing which results in water pollution by biodegradable water pollutants, or (4) processing which results in water pollution by water pollutants which are not easily biodegradable or are toxic One of the problems in levying the cess on polluting industries has been the different

[7]Mono Lake case (*National Audubon Society v. Superior Court of Alpine County*).

approach adopted by various courts in the interpretation of industries covered under the 'specified industries' in the Schedule.

In *K. S. P. C. Board v. Gwalior Rayon Silk Manufacturing Co. Ltd.* the scope and amplitude of Rule 6 of the Water Cess Rules 1978 made under the act was in question. Under rule 6 rebate was a given to a consumer who installed any plant for treatment of sewage or trade effluents. The petitioners company had installed treatment plant before the commencement of act but no rebate was given. The court held plant should not be merely installed but should be capable of control of pollution for which the act has been made. In *M/S Durga Glass Works, Firozabad v. Union of India* it was held that it is not possible for the legislature to mention each and every industry in the schedule I. Merely the board has taken a plea that it falls under ceramic industry is of no consequence as the court is to see under what item of the schedule the industry falls.

3.2.3. Environment (Protection Act) of 1986

Article 253 of the Constitution empowers parliament to make laws implementing India's International obligations as well as any decisions made at international conference, association or other body. The broad language of Article 253 suggests that in the wake of Stockholm Conference in 1972, parliament has the power to legislate on all matters linked to the preservation of natural resources. The Environment Protection Act of 1986 was adopted in light of Stockholm Conference.

The Environment (Protection) Act of 1986 clearly extends to water quality and the control of water pollution. Section 2(a) of the Act defines the environment to include water and the interrelationship which exists among and between water and human beings, other living creatures, plants, micro-organisms, and property. The Act authorises the Central Government to establish standards for the quality of the environment[8] and for emission or discharge of environmental pollutants from any source.[9] Under Environment (Protection) Rules general standards and industry-based standards for certain types of effluent discharge has also be set up. The Environment Act includes a citizens' initiative provision[10] and a provision authorising the Central Government to issue direct orders to protect the environment.[11]

[8]S.3(2)(iii)
[9]S. 3(2)(iv)
[10]S. 19(b)
[11]S.5

3.3. Government Initiative

Government initiatives for water management are outlined in the notifications issued by the governments from time to time. National Water Policy 2002, National Conservation Strategy and Policy statement on environment and development.1992, Policy Statement for Abatement of pollution, 1992 are some progressive notification in this regard.. The strategy and policy statement prescribe command and control, fiscal incentives and use of economic instruments as mechanism for water pollution control (Bhat, 2010).

3.3.1. Environment Impact Assessment (EIA)

EIA could not find a place in the entire major environment Acts of India. Environment Impact Assessment notification 1994 was issued by the Ministry of Environment to seek environment clearance. Before 1997 the Pollution Control board had nothing to do in the assessment process but by an amendment to the notification the SPCB were given new role. An application is to put forward before the board. The board is bound to give notice for public hearing. A panel representing the Board, the State Government, local authority and other senior citizen hear the views of public on proposed project. But the concern here is by notification of 2006 the Ministry of Environment has removed tourism related projects from EIA. (Menon M. & Kohli K.; 2006) Tourism and water resources are closely linked and the privilege cannot be justified.

3.4. The Judicial Approach

As seen earlier also the judiciary has played a vital role in the protection of water resources from being polluted. In this regard the study of landmark cases becomes vital.

The case of *M. C. Mehta v. Union of India (Ganga Pollution (tanneries) case* highlights the polluted condition of river Ganga more than thirteen years after the enactment of Water Act. In this case the court issued direct orders to private tanneries, including orders to cease operation. The Court also directed the central Government, pollution Control Boards and the Executive authorities to monitor the situation.

In yet another PIL filed by M. C. Mehta *(Ganga Pollution (Municipalities) case)* the Supreme Court held that the municipalities of Kanpur has to bear the major responsibilities for the pollution of the river Ganga near Kanpur city. The court cited the excerpts from U. N. Mahida book titled 'Water Pollution and Disposal of Waste Water on land (1983): those

who cause pollution are seldom the people who suffer from it. The industries discharge their untreated sewage and industrial waste water from their own neighborhood. But in doing so they create intense pollution in streams and rivers and expose the downstream riparian population to unhygienic conditions.

The Court ordered the city municipal authorities to fulfill statutory duties including removal of dairies or waste from the dairies, increase of the capacity of sewers in labor colonies, stricter enforcement to prevent the placing of dead bodies in Ganga.

A decade after the Kanpur tanneries case the Calcutta tanneries were discharging untreated effluents into the river Ganga *(M.C. Mehta v. Union of India Calcutta tannery case).* The court, in the absence of any possibility of setting up Common Effluent treatment plant at the existing location of tanneries ordered the relocation of Industries and issued directions to that effect. Further the Court directed the Calcutta High Court to monitor the matter in future.

The Court ordered the State Government to render all assistance to the tanneries in the process of relocation. A fine of Rs. 10,0000 each was imposed on all the tanneries.

In a case involving the non-performance of its statutory duty to provide proper sanitation facilities and drainage by a Municipality, the Supreme Court in *Municipal Council, Ratlam* v. *Vardichan Ors.* brushed aside arguments of failure due to insufficient finances and held that it would result in a situation where 'a profligate statutory body or pachydermic governmental agency may legally defy duties under the law by urging in self-defence a self-created bankruptcy or perverted expenditure budget'. A responsible municipality constituted for the precise purpose of preserving public health and providing better finances cannot run away from its principal duty by pleading financial inability.

The decision of the National Consumer Dispute Redressal Forum (NCDRC) in *Consumer Education & Research Society* v. *Ahmedabad Municipal Corporation* has brought into focus the possibility of using consumer protection law in order to enforce the statutory duty of the municipal bodies to supply clean and sufficient water. The court established a right under the Consumer Protection Act, 1986 on the basis that as per the Statement of Objects and Reasons of the Act and also the Objects of the Consumer Protection Councils, a consumer has the right to be informed about the quality, quantity, purity of goods, including water or services which are rendered by the Statutory Authorities.

4. WATER POLLUTION CONTROL LAW IN SWEDEN

With the adoption of the 2000 EU Water Framework Directive, the water pollution control law has shown a remarkable change. In order to understand the present system of governance of control of water pollution in Sweden it is necessary to study a brief historical background in this field. The legislative bodies in Sweden have been looking for the most effective solution since many decades.

The concern for control of water pollution began as early as in 1918 where Water Rights Act regulated the use of water for the production of hydroelectric power and protection of pollution of rural communities. In 1952 the protection of Nature Act and the Riparian Law was enacted which was subsequently updated by the 1964, Nature Conservancy Act. The Nature Conservancy Act, though not self sufficient to resolve the problem of water pollution but it lay down national policy guidelines and procedural rules for the protection and conservation of the environment (Jones, 1974). Three years down the line in 1967 Nature Conservancy Agency (naturvårdsverk) was set up as a central regulatory agency for conservation of environment, including water. However with the increasing international concern over pollution, a Royal Commission was appointed in 1963 to study the problem and make recommendation to the Government (Jones, 1974). After a series of review of the Report of the Commission and much debate and discussion the 1969 Environment Protection Act came into existence. The act was a new comprehensive legislation against water pollution and other types of pollution. It consolidated the previous existing laws. The approach was by controlling the use of real estate, water pollution could also be controlled. Individuals, municipalities and industries are dealt with only in relation to the use of real estate. Any activity which was likely to pollute water required previous permission. (Jones, 1974)

The pollution control regime has travelled a long journey to see the light in the present form. The Swedish strategy is based almost solely on regulatory instruments with water administrations spread over different institutions at different level (Hedelin, 2005). The current water pollution control regime is based primarily on three legislation viz. 1970, The Public Water and Wastewater Plant Act; 1971 Food Act and 1998, The Environmental Code.

The Public Water and Wastewater Plant Act states that it is responsibility of the municipality to arrange sufficient water supply and sewage treatment services to assure the municipal population of good health (Mats, 2002.). If water supply and sewage treatment facilities are inadequate to meet the health needs the county administrative board can order the municipality to fulfil their obligations.[12]

Under the Food Act, drinking water has been considered as food stuff and it is mandatory to handle it with equal standards as other food production (Mats, 2002).

The Swedish Environmental Code is an amalgamation of numerous previous acts into one single code. It is major piece of legislation drafted in the manner to best adopt the EU Water Framework Directive. The researcher has primarily relied on this code to study the legal régime of control of water pollution in Sweden as this was the only legislation translated into English by the Ministry of Environment. The environmental Code regulates environmental standards and stipulates measures to be taken to prevent and minimise impacts on the environment caused by water abstraction and sewage effluents (Mats, 2002).

5. INSTITUTIONS DEALING WITH MAINTAINING WATER QUALITY IN INDIA

The ministry of Environment and forest through CPCB and respective SPCB are in charge of controlling water pollution in India. But there are other institutions which also contribute to the prevention and control of water pollution in India. They are:

5.1. State and Central Pollution Control Boards

The Water (Prevention and Control of Pollution) Act, 1974 primarily vest the duty on the PCBs with the monitoring of water quality deterioration and responsible for prevention and control of pollution (http://envfor.nic.in/mef/WQAA.pdf)

5.2. Central and State Groundwater Boards

Develop groundwater resources depending upon the recharge and monitor groundwater quality across the country (http://envfor.nic.in/mef/WQAA.pdf).

5.3. Water Quality Assessment Authority

Constituted by the Ministry of Environment and Forests in 2001, this Authority is empowered to exercise the powers under Section 5 of the Environment (Protection) Act,

[12]See Section 2 of Water and Wastewater Plant Act.

1986. The mandate of this Authority is to direct agencies to standardise water quality monitoring methods, ensure proper treatment of wastewater to restore the water the water quality of surface and groundwater, to take up R&D Activity related to water quality management and promote recycling and re-use of treated wastewater (http://envfor.nic.in/mef/WQAA.pdf).

5.4. Municipal Authorities and Public Health Engineering Departments

The local bodies are tasked with the duty of supplying safe and adequate drinking water to the citizens (http://envfor.nic.in/mef/WQAA.pdf).

5.5. National River Conservation Directive

Set up under the Ministry of Environment and Forests the National River Conservation Directive monitors the water quality to evaluate the implementation of pollution abatement schemes for river conservation. It is in charge of coordinating several river conservation plans.

5.6. Central Water Commission & Surface Water Agencies

While developing water resources through various means in states are concerned with the requirements for irrigation and drinking water in terms of quantity and to some extent quality.

6. INSTITUTION DEALING WITH MAINTENANCE OF WATER QUALITY IN SWEDEN

The primary responsibility of maintain the good environment quality vest with the Swedish Government. Ministry of the Environment preparing take decision decisions on environmental policy matters. However all ministries have responsibilities for environmental consequences in their field. The policies and programmes are implemented by government agencies with the help of regional offices in the county administrative boards. At the local level the municipalities play key role for the enforcement of environmental (http://www.sweden.gov.se).

6.1. The Swedish Environmental Protection Agency

The Swedish Environmental Protection Agency (Swedish EPA) is the central government agency for coordinating and promoting environmental policy and protection nationally, in

the EU and at international level. The Swedish EPA drafts proposals for objectives, action strategies and policy instruments, disseminates information and evaluates the environmental situation and work being undertaken (http://www.sweden.gov.se).

6.2. The National Board of Housing, Building and Planning

The National Board of Housing, Building and Planning - Boverket - is the central government authority for town and country planning, management of land and water resources, building and housing (http://www.sweden.gov.se)

6.3. The Environmental Objectives Council

The Environmental Objectives Council promotes consultation and cooperation in implementing the environmental quality objectives adopted by the Riksdag. The Council consists primarily of representatives of central government agencies and county administrative boards. It is assisted by a group of experts representing local authorities, county councils, environmental NGOs and the business sector (http://www.sweden.gov.se)

6.4. Municipalities and county administrative boards

Municipalities share responsibility with a number of government agencies for ensuring compliance with legislation in the environmental area, particularly with regard to water supply, wastewater treatment, waste management, food safety, monitoring and inspection. They also provide advice and information to prevent and limit the risk of damage and breaches of the law. County administrative boards, provide support and advice to the operational regulatory authority in municipalities in order to coordinate supervisory and regulatory activities in their county. The county administrative boards are in charge of environmental monitoring and supervision of the air, ground and water and are responsible for inspections and enforcement, mainly in the case of activities that entail a major environmental impact. They are also engaged in nature conservation aimed at maintaining functional ecosystems and preserving biological diversity. (http://www.sweden.gov.se).

6.5. The National Food Administration

The National Food Administration is responsible for checking the quality of food and drinking water; i.e. monitoring that concentrations of pesticide residues do not exceed permitted levels (http://www.sweden.gov.se).

6.6. The Geological Survey of Sweden

The Geological Survey of Sweden is responsible for progress towards achievement of the national environmental quality objective Good-Quality Groundwater and involved in efforts to attain the objective A Good Built Environment (http://www.sweden.gov.se).

6.7. The National Board of Health and Welfare

The National Board of Health and Welfare coordinates work on environmental health (http://www.sweden.gov.se).

6.8. The National Heritage Board

The National Heritage Board is the central authority for matters concerning the historic landscape and cultural heritage (http://www.sweden.gov.se).

6.9. The Rescue Services Agency

The Rescue Services Agency is responsible for preventing and responding to environmental accidents (http://www.sweden.gov.se).

7. CASE STUDIES FROM INDIA

"There is an increasing trend in environmental pollution. Water is polluted by four kinds of substances: traditional organic waste, waste generated from industrial processes, chemical agents for fertilisers and pesticides for crop protection and silt from degraded catchments. While it is estimated that three-fourths by volume of the waste water generated is from municipal sources, industrial waste, though small in volume, contributes over one-half of the total pollutant load, and the major portion of this is coming from large and medium industries. For class-I cities of the Country, less than five per cent of the total waste water generated is collected and less than one-fourth of this is treated" (Policy Statement for Abatement of Pollution, 1992)

With the increasing use of water for various purposes the conflicts among water users over issues of water quality has also increased. Case studies (See Table below) from India reveal

that the users first protested and later took up the issue in court through petitions or public interest litigation. In few cases the court ordered closure of the polluting units, while in some cases they have been asked to pay compensation to the victims. In India, the environmental law have recognised pollution as a criminal offence. The way the existing legal system operates often precludes the possibility of mediation (Appasamy, 2008).

The case studies help us to understand any problem better and with regard to control of water pollution cases studies becomes unavoidable.The case studies has been done to understand the impact of water pollution on other water users, and the protests or legal measures which the victim have taken to redress the problem. The major concern from these case studies is why have industries failed to ensure that their effluents are properly treated? Is closure of industries a solution? What is the long term solution?

No.	Basin	State	Source of Pollution	Affected Sector(s)	Action Taken
1.	Musi River (Hyderabad)	AP	Industries sewage	Farmers, residents	Protest, court case
2.	Noyyal River (Tiruppur)	TN	Textile Industries sewage	Farmers, Water Supply	Court case; compensation
3.	Palkar basin	TN	Tannery Industry sewage	Farmers, Water Supply	Supreme Court case; compensation
4.	Kolleru lake	AP	Aquaculture, Agricultural Runoff; Industrial effluents	Fisherman. Ecosystem	Wildlife sanctuary
5.	Puducozhaalur village	Pondicherry	Berger paints effluents	Ground water pollution (irrigation, drinking water)	Complaint to public work department
6.	Kolhapur (Chipri Village)	Maharashtra	Ghodavat oxalic Acuid Plant effluents	Health, drinking water	Protest, factory closed
7.	Kanpur (Ganga basin)	UP	Tannery effluent, sewage, sludge	drinking water, Health, ecology	Public Interest litigation, Ganga Action Plan
8.	Hootgali Village (Mysore)	Karnataka	Chemical Units		Alternative Supply; protest by villagesrs
9.	Arkavati Subbasin	Karnataka	Textile units chemical	Irrigation, fisheries	Pollution control Board orders closure
10.	Chaliyar Basin	Kerala	Grasim Industries (Rayon/ pulp)	Health, drinking water	Factory closed
11.	Ekor Island (Periyar Basin)	Kerala	Insecticides and other chemical units	Health, fisheries, ecology	Supreme Court Monitoring committee, Local Area Environmental Committee
12.	Khari River (Sabarmati Basin)	Gujarat	Industrial effluents	Health, water supply, agriculture, livestock	Representations, petitions, PIL, High Power committee; stakeholder forum.

Table 1: Water Quality Conflicts in various parts of India. (Appasamy, 2008)

7.1. Case Study from River Periyar in Kerala

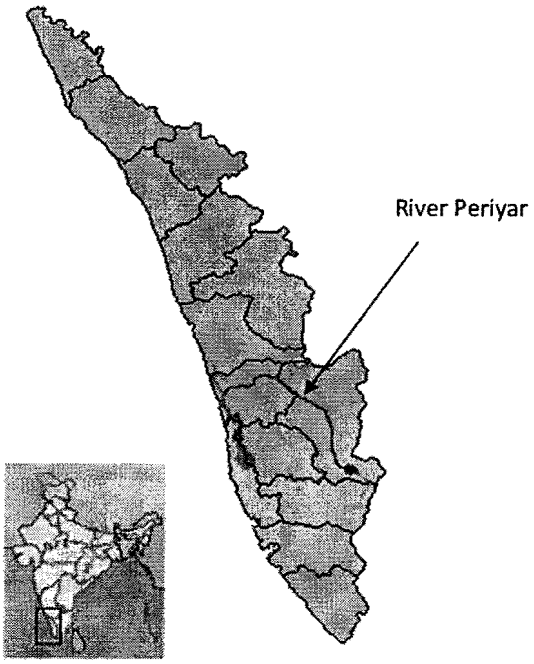

Figure 4: Location of River Periyar in the State of Kerala

7.1.1. Background

Kerala - 'Gods' own country', is located on the southern most part of India on the Western ghats. Periyar is the longest river in the State of Kerala. The Periyar is known as the Lifeline of Kerala; it is one of the few perennial rivers in the region and provides drinking water for several major towns. Eloor is a tiny island village on the river Periyar in Kerala. The village has a population of about 40,000. The largest industrial cluster in the State—the Udyogamandal Industrial Estate is situated here. There are 247 industrial units including the only DDT (Dichloro Dipheny Trichloro Ethane) producing factory in India (Hindustan Insecticides Limited). Of these, 106 are chemical units that manufacture fertilizers, pesticides, petrochemicals, rare earth elements, rubber processing chemicals, zinc/chrome products and leather products. The factories use large amounts of freshwater from the Periyar and discharge untreated toxic effluents into the river. Gas emissions range from acid mists, sulphur dioxide, hydrogen sulphide, to ammonia and chlorine.

The lower reaches of the Periyar are heavily polluted and the natural color of the river is hard to see any more and is apparently colored. Studies reveal that downstream stretches of the river are almost dead. The aquatic life has been badly devastated. Often massive fish kills occur in the river due to the toxicity of the water.

7.1.2. Status of Water Quality of the river Periyar

A team of scientists from Cochin University of Science and Technology studying the region say that Eloor's ecology and environment have almost reached moribund stage Not only has the health of the population undergone a drastic decline, but fish species in the river have come down in the last twenty- five years from thirty-five to twelve (Suchitra, 2008). Death of fishes on large scale is not an unusual phenomena to be seen here (Hindu, 2011).

7.1.3. The remedial process

In August 2004, the Supreme Court Monitoring Committee (SCMC) on Hazardous Wastes assessed the situation in Kerala and observed, The ground realities in Kerala are terrible. Kerala is one of the States that have miserably failed to act on hazardous wastes. The PCB has willfully and callously disregarded the Supreme Courts orders on hazardous wastes. The SCMC found that several industrial units had been operating without the authorization required by the Hazardous Waste (Management and Handling) Rules 1989. It also found that provisions of the Air (Prevention and Control of Pollution) Act and Water (Prevention and Control of Pollution) Act are being openly flouted. The SCMC threatened the KSPCB officials with contempt of court unless effective action was taken. (Suchitra, 2008)

In October 2004, the SCMC completed a second round of review and observed that both the state governments and the PCB have totally disregarded the directives of the committee. In a bid to inject transparency and make the process of pollution control participatory, the SCMC set up a Local Area Environmental Committee (LAEC) with representatives from the PCB, industry association/industrial units and local environmental groups. (Suchitra, 2008)

Since November 2, 2004, the LAEC carried out an environmental audit of all the 247 factories in Eloor. It completed checking over seventy factories for raw materials, products, production process, waste generation, compliance with environmental laws,

unauthorized disposal of wastes, etc. The Committee submitted its Environment Impact Assessment (EIA) Report (2004-2006) to the SCMC in March 2006. The EIA report gives a very deplorable picture of the Eloor-Edayar Industrial Estate and demands immediate action to arrest further deterioration. The report recommends that the KSPCB should endeavor to achieve zero discharge by the industries within three years. It also recommends revising the parameters issued to each chemical industry in this region (Suchitra, 2008).

LEAC term was over by March 2006 and since then the industries continue to pollute the river as there is no monitoring committee. However with the SCMC sword hanging, some hopes have revived. Some of the companies have started following compliance measures. The State pollution board has also sprung into action and has started collecting water samples from the river for test after large-scale fish death and damage to aquatic life were reported (The Hindu, 2011).

Figure 5: Fishes die in river Periyar due to industrial pollution

7.2. Case study from Hussain Sagar Lake in Andhra Pradesh

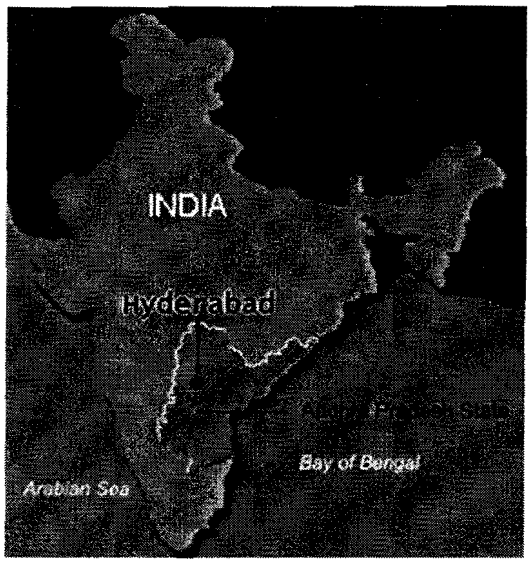

Figure 6: Hyderabad, Andhra Pradesh

7.2.1. Back ground

Hyderabad is the capital city of Andhra Pradesh in India and is popularly known as the cyber city. Hussain Sagar is a lake in Hyderabad built by Hazrat Hussain Shah Wali in 1562, during the rule of Ibrahim Quli Qutb Shah. It is one of the largest man made perennial lake. It was a lake of 24 square kilometres built on a tributary of the River Musi to meet the water and irrigation needs of the city.

Since 1930 the lake is no more used for drinking water because of the increasing pollution of the lake. Today the lake has become susceptible to sewage and industrial effluents from catchment areas. Eutrophication, algal blooms, growth of water weeds and bad odor is not unusual. Immersion of Lord Ganesha and Godessess Durga idol during *Vinayaka Chaturthi* and *Dusshera* (Hindu religion festival in India) further increases the load of pollution every year. Although several Central Effluent Treatment Plant and Sewage Treatment plant have grown up to restrict the pollution yet a considerable amount of sewage flows into the lake.

7.2.2. Status of the lake water quality

During the past few years grave concern is being voiced by people from different walks of life over the deteriorating conditions of Hussain Sagar Lake. Over the years the entire eco-

system of Hussain Sagar Lake has changed. The water quality has deteriorated considerably.

7.2.3. Measures to protect the Lake

Since 1995 several Public Interests Litigations have been filed to save the Hussain Sagar Lake. The first PIL was filed in the Andhra Pradesh High Court (HC) against the Government of Andhra Pradesh, seeking protection of lakes in Hyderabad. The judgment on the PIL included the protection of all the water bodies in the state of Andhra Pradesh.

In the year 2002 petition was again filed by an NGO in the AP High Court against the government of AP, to save the lake from encroachment. The court directed the government of AP to stop construction of any permanent structure on or near the water spread or catchment area. It also directed that any type of construction can be done only after the examination and certification of the Andhra Pradesh Pollution Control Board (APPCB).

The Hyderabad Urban Development Authority (HUDA) came up with a notification (2000) to protect the lakes in and around Hyderabad. Despite such notification, there are several instances of permissions given by HUDA itself for residential colonies in lakebeds. Under the aegis of Buddha Purnima Project Development Authority a number of tourism related beautification work can be seen around Hussain Sagar which is in serious violation of HUDA's own notification.

During the year 2003 -04 a number of petition were filed in the Andhra Pradesh high Court for the protection of Lake. The court directed the APPCB to monitor and protect the lake from pollution and violation of Environment Protection Act 1986 and Water Act 1974. The court also stated that stringent action would be taken for the violation of the rules laid down by the APPCB. The issue which arises here is do APPCB needs direction from the court to take action for violation of its rule despite the fact the board is statutorily empowered to take actions. Definitely the board is also equally guilty in failing to protect the lake.

Despite the High Court's order the petition for protection of lake kept on coming in the subsequent years. Hussain Sagar Restoration Project aided by the Japan Bank for International Cooperation has made little progress (Centre for Science and Environment). The color of the water has still not become colorless which speaks for itself that there is

miles to cover to make the lake pollution free and make it once again fit for drinking purpose.

Figure 7: Algal blooms and pollutants in Hussain Sagar Lake

8. THE EU WATER FRAME WORK DIRECTIVE - A TOOL TO GOVERNING WATER POLLUTION EFFECTIVELY

The various water bodies in one way or the other are always interlinked with each other. In such a situation management of the water bodies in sectorial manner keeps the problem of water pollution unresolved. The EU Water Framework Directive is a remarkable international legislation in the field of water. As a tool to effective water governance the directive springs from concerns by the member states of the European Union over the sectorial approach in management of water within the community and reflects the move towards integrated environmental management (Chave, 2001). It takes a holistic approach towards water management. The prevention of any degradation in the water bodies and protection and improvement of the status of aquatic ecosystems is the primary objective of this Directive. The overall aim of the directive is to attain the "good status"[13] in all water

[13]Status achieved by water body when both its ecological status and its chemical status are at least good; Article 2 (18) - (28) of EU WFD are relevant in this regard.

resources. The directive has come up with a number of innovative steps required to be adopted by the member states in a stipulated period of time.

8.1. Background to the Directive

The European Union Water Framework Directive is the result of increasing demand by citizens and environmental organizations for cleaner rivers and lakes, groundwater and coastal beaches. It is an overarching piece of legislation that aims to harmonize European water policy and to improve water quality (Kaika & Page, 2003). From 1973 - 2000 a series of environmental action programmes were adopted. The action programme identified a number of priority issues that needed to be resolved in order to reduce water pollution and to improve the quality of natural water in the countries of EU. Early approach was of sectorial in nature. Realising the limitations of using specific regulatory measures for individual problems, the 5th Environmental Action Programme took a different approach by adapting a long term sustainable management of natural resources. In the Water sector this means taking an overall, integrated view of quantity and quality of available water, how it is utilised, and what measures are needed to protect it over the long term (Chave, 2001). European Water Policy took a step forward in 1995 that took account of overall community environmental policy. The 1988, resolution (EU 1988) specifically required action to improve ecological quality of surface waters in the community. The 1992 Resolution on ground water policy emphasized on the importance of ground water for human health and for all forms of life and ecosystem. In 1996 a proposal for an action programme for the integrated protection and management of ground water was presented which drew attention to the need for the regulation of the abstraction of ground waters and to links with the monitoring of freshwater quality and quantity (EU 1996.). A number of other official decisions and resolutions had a formative role in the development of the directive[14]. As a result a need for more integrated approach to water management was felt and in February 1997 published a proposal for a new framework directive for the water field. A further three years later on 22nd December 2000 the Directive was passed in the existing magnificent form.

[14]See 1991 Declaration of the Ministrial Conference on groundwater at the Hague; 1995 European Environmental Agency's report.

8.2. Objectives of the Directive

The objectives of the directive have been stated in Article 1 of the Directive. It is intended the water resources are managed on an equitable and sustainable manner and to reduce water pollution. The purpose is to:-

1. Establish a framework for the protection of inland surface waters, transitional waters, coastal waters and ground waters;
2. Prevent further deterioration and protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands;
3. Promotes sustainable water use based on a long-term protection of available water resources;
4. Protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
5. Reduction of pollution of groundwater.
6. Contribute to mitigating the effects of floods and droughts.
7. Achieve 'good water status'.

8.3. Salient features of the EU WFD

The innovative salient features of the directive could be broadly categorized into four points:-

8.3.1. River basin basis management - Article 13 & 5

Water bodies in one way or the other are interlinked to each other. Naturally the water flows from the high reservoir of a watershed towards a river network. The underground waters are also connected to rivers or lakes. The directive therefore adopts the river basin as the natural management unit for the protection of water. For the holistic management of water bodies, the directive obliges the member states to identify river basins and all of their associated surface and underground waters. To maintain the quality of water it is necessary to have an effective monitoring of the water bodies. The directive imposes a duty on each member state to ensure for each river basin district or for the portion an international river basin district falling within its territory to analyze the characteristics of

the respective river basin both economically and ecologically. The activities of the human beings affect the water bodies in a worst manner; hence the directive duty bounds the member states to review the impact of human activity on the status of surface waters and on groundwater. Comprehensive guideline (Article 8) has been proscribed for monitoring of surface water status, ground water status and protected area. Emphasis has been made to maintain the quantity and quality of water both in terms of ecological status and chemical status.

8.3.2. Combined approach for the control of pollution - Article 10

The general approach in pollution control is to put a limit on the emission of pollutants. But the issue is where to we put the limit. Is it at the discharge of the point source or to the discharge at diffuse sources? The second approach is to maintain the quality of water body. Except a few cases where they operate together, in majority of legislation they are separated and often go in parallel (Chave., 2001). The "combined approach" of the directive not only suggests for emission control at the source of pollution based on best available techniques or the relevant emission limit value but also suggests setting targets for quality to be achieved in water bodies.

Such a combined approach guarantees dual protection. First its checks the pollution at the point source itself say in the case of identified sources like factories. But the problem still persist from the diffused shows sources which in no manner possess lesser threats than the point source. In such situation the monitoring of the water quality standards will help to check the problem of water pollution. In order to achieve this, any communication gap between the river basin district authority and any other regulatory bodies that may have control over these other activities is to be abridged. The herculean task before them is to identify and control various activities, discharges and other issues causing effects on water status throughout the river basin district. For the effective implementation of such policy the competent authorities in each river basin districts needs to be empowered both by law and resources. (Chave, 2001)

8.3.3. Water pricing - Article 9

The unique feature of this directive is that it recognizes water of economic value. The cost of water management and infrastructure development has to be recovered from the different water users i.e. industry, household, agriculture. The objective is that consumers

use water wisely and judiciously and thereby contribute to the environmental objective of the directive. But this approach may lead to commercialization of water and thereby raise conflicts amongst different stake holders as it happened in the case of Ghana. (Suleiman, 2010).

The widely accepted general principle of environmental law, 'pollutor pays principle'[15], has been duly recognized by the directive. "The 'polluter pays principle' states that whoever is responsible for damage to the environment should bear the costs associated with it." Not only the damage caused to the environment but also the cost of restoration is to be included. But the damage caused to the environment and costs to be levied is a subjective question and at times are purely defined by whims of policy makers and advocacy group. (Cordato, 2001)

8.3.4. Public participation - Article 14

Whenever a new policy is adopted or intended to be implemented a large number of people are likely to be affected directly or indirectly. For governing water pollution effectively it is necessary that all those people who are likely to be affected are taken care of. This cannot be achieved in any other better manner than to consult the interested parties. Consultation may help in bringing modification in the policy, determining compensation etc. The participation of public and inviting them for consultation is encouraged by the directive in various specified manner. Responsibilities have been placed on various authorities to publish plans, to provide information, and to consult with the local people and with other interested parties within a stipulated time framework. The directive also lays down procedures for recording and reporting the results of the activities that are established to assess their success or otherwise. Most of the reporting is to be taken through the medium of the river basin plans. (Chave., 2001)

8.3.5. Strategies against water pollution

An integrated approach to water management is the key feature of EU Water Framework directive. The quantity and quality of groundwater is also dependent on the surface water. Thus pollutor may unintentionally pollute the ground water because ground water is indivisible part of the hydrological cycle. Thus the quality of ground water i.e. drinking

[15]Rio Declaration, 1992 - Principle 16 "National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution...."

water will seriously be affected and once polluted it will be very difficult to return to its native form.

Realizing the gravity of problem the directive imposes a duty on member states to adopt specific measures against pollution of water by individual pollutants or group of pollutants which poses a significant risk to aquatic environment and drink water (Article 16). Measures are to be taken in progressive reduction of those pollutants and cessation of discharge and emissions of 'priority hazardous substance[16]'. The adopted list of priority substance is not final but subject to monitoring and review. The list has to be reviewed at least every four years. Article 17 of the directive is specifically dedicated to prevention and control of pollution of ground water. Paragraph 28 of the preamble based on 'preventive principle[17]' recognizes that "the task of ensuring good status of groundwater requires early action and stable long term planning of protective measures owing to natural time lag in its formation and renewal".

Within the 'basic measures' of Article 11, a system to regulate both point source discharges and diffuse sources which may cause pollution must be established. This could be achieved by prohibiting the entry of such substance into water or by putting a limit on their emission.

The key issue which needs to be addressed in implementing the above provisions is that generally in many countries the water rights and land ownership are linked together. Land owners have also the right in the water laying under the ground the posses. They use it whatever manner they want. In order to ensure that water resources are preserved and equitably distributed such water rights are to be separated (Chave, 2001). Many countries in Europe have started recognizing such change.

Some water bodies can also be designated as 'protected areas'[18]. Article 6(1) specifies that the areas will have been designated "as requiring special protection.... for their surface water and ground water or for the conservation of habitats and species directly depending on water."

[16]Defined in Artcle 2(30) and listed in Annex X of EU WFD.

[17]One of the general principle of international environment law, prohibits actions which cause or may cause harm to the environment and necessary actions are to be taken at an early stage before the damage has actually occurred.

[18]See Annex IV. Of EU WFD.

8.4. Implications of EU WFD

The goal of the 2000 Water Framework Directive (WFD) is to achieve good water status for all waters (inland, coastal and river) across the European by 2015. The Directive also aims to ensure that clean waters are kept clean. Looking at the extensiveness of the WFD, what makes me think at this juncture is what its likely potential implication is?

Howe and White (2002 and 2003) have discussed the general potential implication of EU WFD with focus on UK. The impact of changes in various member states is likely to depend upon its previous planning and policies (Hedelin, 2005). For example the French model is more pro towards the WFD (Gustafsson 1989a and Gustafsson 2000),while the Swedish system shows a remarkable deviation from the WFD (Gustafsson 1989b) and hence the changes required will be manifold. Water administration in Sweden is spread in different institutions at different levels. Central institutions are generally responsible for permits; regional governmental institutions and municipalities manage the environmental supervision (Hedelin, 2005). Unlike EU WFD plan, long-term water planning is carried out at the municipal level in Sweden and the natural hydrological boundaries are not used as a base for water management (Gustafsson, 1994). These aspects all suggest that large changes will occur as a result of the implementation of the WFD in Sweden. The municipalities have been been subject to criticism for not dealing with water issues in a satisfactory way in their physical planning (Boverket, 1994, Gunnarson, & Malmqvist, 1996, Gullstrand et al. 2003). Boverket's (2004) and Emmelin and Lerman's (2004) studies opines that it will be a difficult to continue with a situation where two parallel planning system for water exist.

The above studies reflect that major changes have to be there in Swedish system of control of water pollution. As such this, research study is aimed at finding out how the legal regime on control of water pollution in Sweden has changed according to the EU WFD and how effectively it is being implemented.

9. Implementation of EU Framework Directive in Sweden

Before the coming of EU WFD, the administration of water was spread over a number of administrations at various levels. The Swedish planning system has historically characterized as a strong central state level and water and land use as municipal task, while the regional level has had little task (Bohme, 2002). Sweden is divided into 290

municipalities with 21 county boards at the regional level. The master plans prepared by the municipalities handle the water issues. But the administrative bodies residing within the municipal regime do not correspond to natural geographic boundaries of water (Hedelin, B. & Lindh, M., 2008).

9.1. Organization

Parallel to the municipal water planning system[19], a new system of water administration has been established. Sweden have been divided into five river basin districts (RBD): Bottnian Sea, Northern Baltic Proper, Southern Baltic Proper, Skagerrak and Kattegat. (Figure 1). The job of the five River Basin District Authorities is to ensure that the different organisations are working towards the same goal i.e. to coordinate among different organisations.

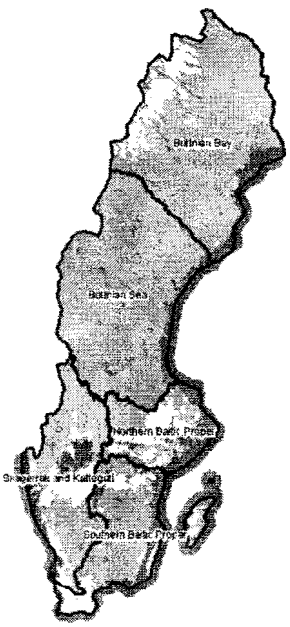

Figure 8: The river basin districts in Sweden. Out of the five river basin districts three are international river basin districts. Bottnian bay is shared with Norway and Finland whereas Skagerrak & Kattegat and Bottnian Sea is shared with Norway.

[19]Described and discussed by (Boverket, 2004), (Emmelin & Lerman., 2004) and (Hedelin B., 2005)

The Swedish Government has the ultimate responsibility for carrying out the Water Framework Directive. The Swedish Environmental Protection Agency and the Geological Survey of Sweden are the two national authorities guiding the River Basin District Authorities by creating regulations and guidelines, amongst other things where as the Swedish Metrological and Hydrological institute provide data and other necessary information for the effective implementation of EU WFD. The river basin management system is based on the natural flow of water. (http://www.vattenmyndigheterna.se).

At every River Basin District Authority there is a Water District Board. Its job is to makes decisions on the authority's various fields of responsibility. The Water District Board comprises of experts from different fields, politicians from County Administrative boards & municipalities.

Sweden's municipalities and County Administrative Boards have important roles in the water management. They contribute a knowledge base to the River Basin District Authorities, and perform a great deal of the operative work on local and regional levels.

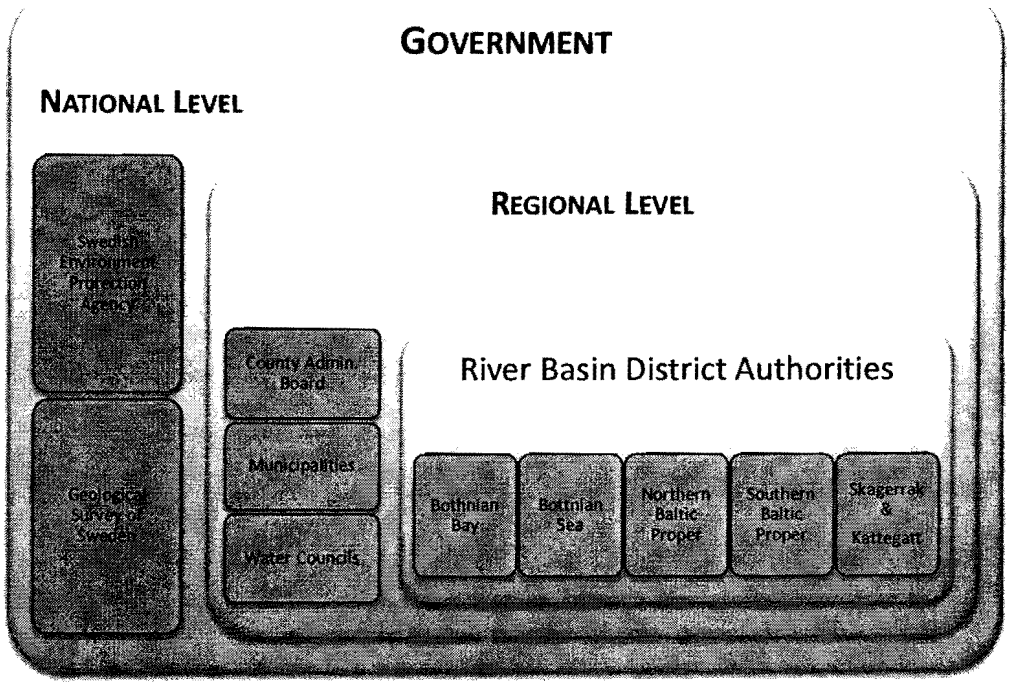

Figure 9: Implementation of EU Water Framework Directive.

9.2. Participatory approach in implementation of EU WFD

Transparency and extensive participation is the key to effective implementation of the Directive. Under the integrated river basin management system all sectors of society take responsibility for water issues. Distributing information and involving all interested parties in the water management are important tasks for the River Basin District Authorities. Formal consultations and public participation are carried out prior to major decisions, such as decisions on environmental quality standards, programmes of measures and river basin management plans. All parties – individuals and organisations alike have the opportunity to offer comments on the suggestions that the Water District Board will decide upon (Ibid).

Under the Swedish river basin management system local participation has been encouraged a lot. Water councils are local and regional collaborative bodies, and exist in several places in Sweden. Here, all the stake holders (municipalities, industries, landowners and interest groups) can meet and develop communal solutions to local water queries. Members of the water councils can, at an early stage, participate in preparations for and discussions on how local water resources are to be managed. As a result of local knowledge and experience, the authorities can ensure that the right measures are carried out in the right place (Id.)

9.3. The management cycle

River basin management work is carried out in six-year cycles. Characterization of the water is the first step of the management cycle. The River Basin District Authorities use this basic data in order to develop suggestions for environmental quality standards (i.e. quality requirements) for each of the district's existing water bodies. If the evaluation indicates that the water will not meet quality requirements on time, measures have to be taken. It is above all the responsibility of the municipalities and County Administrative Boards to carry out the measures presented to them by the River Basin District Authorities. At the end of the management cycle, a river basin management plan is developed, and the results of the work are reported back to the European Union (Id.)

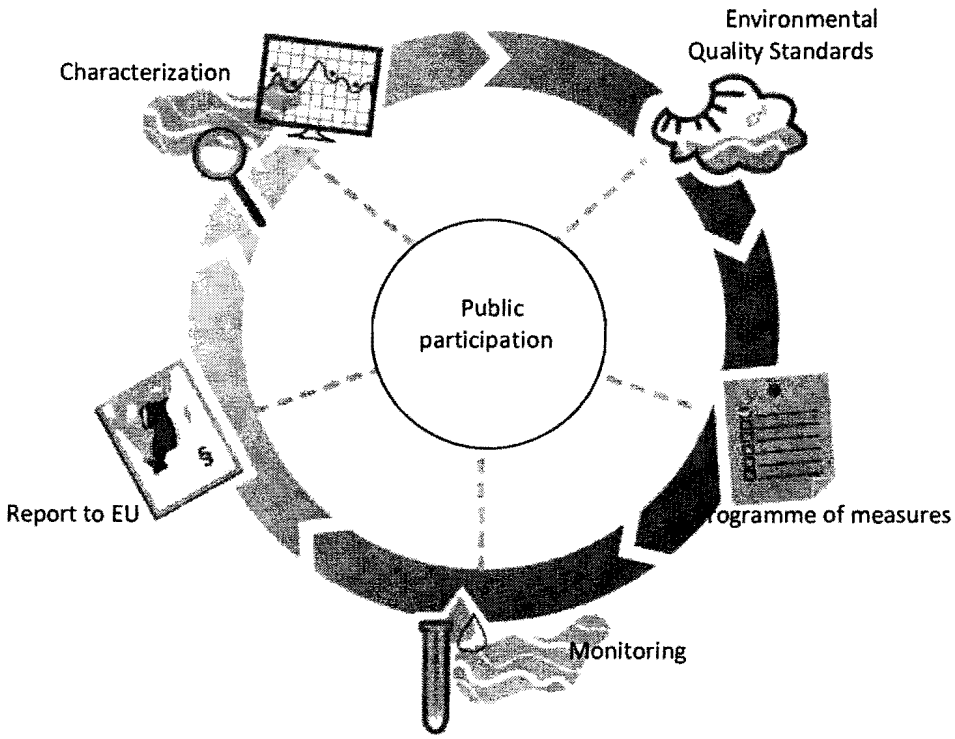

Figure 10: The Management Cycle.
Source: www.vattenmyndigheterna.se

9.4. Study from Stockholm (North Baltic river Basin District)

Amongst the five river basins districts in Sweden, North Baltic is one of them. It covers an area of 36, 700 Km^2 with population of about 3 000 000. The water resources in this district are administered by seven counties, seventy three municipalities and fifteen water organization. In general the water resources are in good condition but major problems are eutrophication, physical alteration and over exploitation of water resources (personal communication with a member of County Administrative Board Västmanland). Pollution caused by building materials, traffic and other activities increase the quantities of nutrients and other harmful substances such as heavy metals and combustion residues.

The 2009 environmental quality standards report for the district specify the quality standards for each water body within the district, of surface and groundwater. The aim is to achieve good status in all water bodies by 22 December 2015. Other quality criteria have been established where there are special reasons. This report identifies the environmental quality standards adopted for each body of water. Urban waste water

treatment plants have been set up to make the water nutrients free before it is finally discharged into water bodies. However the issues of mercury, acidification and eutrophication of the sea cannot be dealt alone by the individual member state alone (personal communication with a member of County Administrative Board Västmanland).

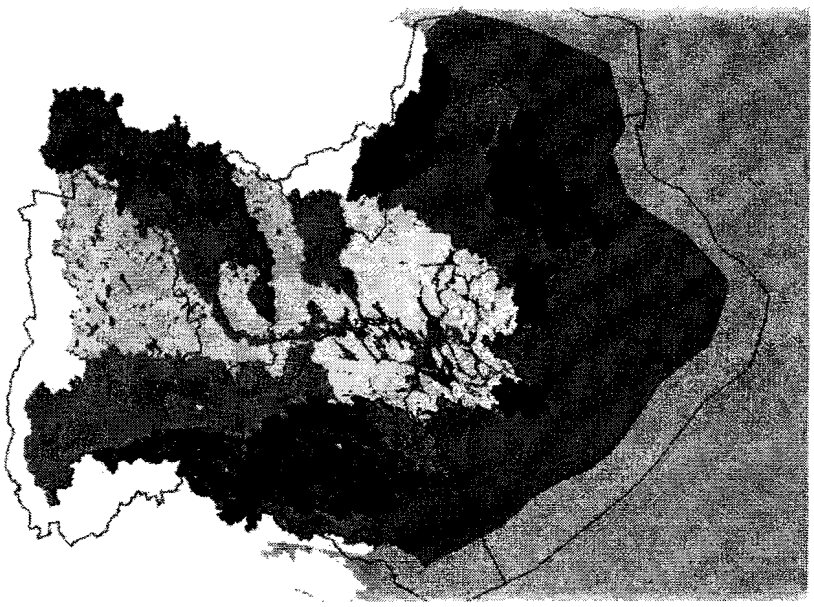

Figure 11: North Baltic River Basin District

	Gulf of Bothnia	Bothnia	North Baltic Sea	Southern Baltic Sea	West Coast
Sea incl. coastal waters (km2)	158 000	147 000	44 000	63 000	73 000
Land area (km 2)	147 000	141 000	37 000	54 000	69 000
Coastal Length (km)	1850	1950	1700	3850	1300
Huvudavrinnings-areas	30	23	13	33	18
Surface water-instances 1	6 944	11 166	1 130	1 623	2 555
Groundwater occurrences	655	781	529	580	478
Population (SCB)	490 000	920 000	3 120 000	2 350 000	2 490 000
Region 2	2	7	7	10	8
Local 3	28	52	76	93	110

1 Lakes, Rivers and coastal waters; 2 A county may belong to several districts; 3 A municipality may belong to several districts

Table 2: Water Districts in Sweden

Source: http://www.vattenmyndigheterna.se

9.4.1. The Stockholm Water Programme (2006 -2015)

Stockholm is a group of island cities and is also the capital of Sweden. Lakes and water courses are integral part of a cities landscape and have excellent drinking water quality. Stockholm Water programme covers the years 2006 to 2015. Besides the overall objective the programme also contains objectives which apply to individual lakes and watercourses. It contains goals and measures for the Stockholm water areas to have better water quality. The overall aim is to achieve 'good water status'. It also ascertains which authority, administration or company is responsible for implementing the measures suggested. The programme is a path shower to the administrative bodies and companies working in the field of water.

Objectives of Stockholm Water Programme 2006 - 15

Stockholm shall have a good water status

By 2015, it is intended to achieve the status of lakes and watercourses as laid down in the EU's Water Framework Directive (http://www.stockholm.se).

1 The quality of run-off water shall be such that a good water status is achieved in the city's lakes and watercourses.

	Secondary Objective	Measures	Responsible20
a.	Stormwater shall be protected against pollution.	Wastewater from the flushing of road tunnels shall be treated before it reaches the recipient.	SRA, CTA
		Assess the scope for alternative road surfaces.	SRA, CTA
		Assess alternative tipping sites/treatment plants for snow on land and in the water.	CTA
		Investigate the sources of pollutants in stormwater (see the Stockholm Stormwater Strategy).	EHA
		Assess how environmentally toxic substances from fire extinguishing water should be handled.	RS
		Stormwater from busy roads shall be treated wherever possible.	SWC, SRA, CTA
		Mapping of land use, catchment areas and secondary drainage basins for lakes and watercourses where this is lacking.	EHA, SWC

[20]CDA - City District Administration; CDPA - City Development Administration; CEO - City Executive Office; CPA - City Planning Administration; CTA - City Traffic Administration; EHA - Environment and Health Administration; PS - Ports of Stockholm; RS - Rescue services; RDA - Royal Djurgården Administration; SA - Sports Administration; SRA - Swedish Road Administration; SCAB - Stockholm County Administrative Board ; SWC - Stockholm Water Company.

b.	The use of environmentally toxic substances shall be minimised.	Planning of traffic, roads and urban development shall be environmentally appropriate (Stockholm Environmental Programme 2002-2006, Objective 1).	CDPA, CTA, CPA
		The city shall impose requirements for the environmental adaptation of chemicals and other goods and services (Stockholm Environmental Programme 2002-2006, Objective 2).	The city's administrative bodies and companies
		Information to boat owners concerning environmentally friendly products.	EHA
		Develop a co-ordinated monitoring programme for environmental toxins in fish and crayfish.	SA, EHA
		Identify sources through material flow analysis for the prioritised substances in the EU's Water Framework Directive.	EHA
		Environmentally toxic extinguishing chemicals shall be replaced by environmentally friendly products.	RS
c.	In connection with land designations, environmental assessments at an early stage shall assess land contamination, water quality and surface water recipients as a basis for the impending implementation of the plan.	Develop and improve the availability of underlying factual information on the city's intranet.	CPA
d.	In connection with detailed plans and building permits, site-specific requirements for stormwater management for the relevant recipient shall be incorporated as a condition for implementation of the plan.	The level of knowledge concerning water issues within the city's administrative bodies and companies shall be increased and be kept up to date. Experience from previous changes and measures shall be reported.	EHA, SWC, CPA
e.	Safe and environmentally friendly handling of wastewater from houseboat dwellers.	Develop an approach to houseboat dwellers. Conditions shall be created to resolve waste management issues in connection with houseboat dwellers in Stockholm.	PS,SWC, EHA
f.	Discharges from individual wastewater outlets shall be minimised.	Create a common city-wide approach to wastewater discharge in garden allotment areas, outdoor recreation areas and in areas where summer houses are transformed into permanent dwellings.	SWC, EHA
		Inventory of individual wastewater outlets for the water and wastewater sector.	SWC, EHA

2 The volume of inflow to the city's lakes and watercourses shall be maintained or increased.

	Secondary Objective	Measures	Responsible
		Stormwater shall be treated locally in the first instance. If this is not possible, it shall be transported to a less sensitive recipient or a wastewater treatment plant. (Reservation: Moderately and severely polluted stormwater	The city's administrative bodies and companies

		shall be transported away from very sensitive recipients).	

3 Land and water shall provide suitable conditions for a rich biological diversity.

	Secondary Objective	Measures	Responsible
		The release of fish shall be carried out in accordance with the Swedish Board of Fisheries' strategy Finfo 2001:8.	SA, SCAB
		Programme for co-ordinated standardized net fishing for Stockholm.	SA, SCAB, SWC
		Foreign, invasive species – information on risks and monitoring.	EHA
		Expanded mapping of aquatic biotopes.	EHA
a.	Remaining natural beaches shall be conserved. New lakeshore promenades and other exploitation in sensitive beach zones shall be avoided.	Mapping and classification of the city's beaches.	CPA
b.	Small natural watercourses and wetlands shall be protected.	Watercourses diverted into culverts and drained wetlands should be restored.	SWC, CDA
		Assess the need to protect remaining wetlands.	CPA
c.	Ecological spreading corridors Shall be protected.	Prepare an inventory of and eliminate migration barriers for fish and other water-borne organisms.	SA, SCAB
		Protect urban green wedges.	CPA, CDPA
d.	Land and water shall be managed in an ecologically sustainable way.	Training concerning ecologically oriented management of parks and natural areas.	EHA
		Requirements concerning works machinery, snow dumping, etc.	CDA, CDPA, CTA
		Assess the distribution of responsibility between companies, specialist administrative bodies and district administrative bodies concerning water management.	CEO

4 Groundwater quality shall be maintained or improved.

	Secondary Objective	Measures	Responsible
a.	Knowledge of groundwater quality shall be improved.	Pollutant sources shall be identified.	EHA
		Develop monitoring and data management.	EHA
b.	Prevent discharges of pollutants to groundwater.	Supervision of environmentally toxic activity, individual wastewater discharges and installations.	EHA
		Information to businesses and the public.	EHA, CDA
		Measures to prevent discharges caused by road traffic accidents, particularly in important infiltration areas.	CTA, SRA, RS,SCAB
		Environmentally friendly materials shall be used for skid prevention measures.	CTA, SRA, CDA
		Leakage of wastewater shall be reduced by continual improvements of the sewer network.	SWC

5 Groundwater levels shall be maintained.

	Secondary Objective	Measures	Responsible
a.	Knowledge of groundwater	Develop monitoring and data management.	CPA, CDPA

	levels shall be improved.		
b.	Groundwater levels shall not change in a way which adversely affects ground stability or harms animals and plants.	Major changes to groundwater levels shall be prevented at the planning stage. Levels before and after construction shall be documented.	CPA, CDPA
		Important infiltration areas shall be identified and protected.	CPA, CDPA

6 Polluted land and sediment areas which have a major impact on surface water and groundwater shall be cleaned up.

	Secondary Objective	Measures	Responsible
	Suspected polluted land in connection with new construction projects shall be investigated and cleaned up where necessary.	Requirements for ground investigations at an early stage in the planning process.	CPA, CDPA, CTA
		Clean-up requirements in connection with confirmed land pollution.	EHA
		Polluted land shall be mapped and clean-up shall be commenced. The spreading of pollutants shall be prevented.	EHA

7 Lake Mälaren shall be protected as a drinking water source.

	Secondary Objective	Measures	Responsible
		Collaboration within the Lake Mälaren water conservation association.	SWC, SCAB, Norrvatten, Ekerö municipality

Stockholm's lakes and watercourses shall be attractive recreational areas for all

Waterways and recreational areas are to be retained and developed. In connection with the establishment of nature reserves, outdoor recreational interests will be balanced against natural values.

1 Open water surfaces and undeveloped lakeshores shall be retained.

2 Existing bathing beaches shall be maintained and have good water quality. Requests for new bathing beaches shall be considered.

3 Continuous promenades shall be developed wherever possible taking into account nature conservation interests.

4 Motorboat sports shall be developed taking into account current motorboat bans and speed restrictions.

5 Existing pleasure craft harbours shall be retained and facilities shall be provided for winter storage wherever possible.

6 Fishing opportunities shall be maintained and improved.

7 Exploitation of a lake or watercourse shall be compensated through equal qualities within the same lake or watercourse.

8 Inter - municipal collaboration shall be developed for the clearing of skating routes and the establishment of canoe routes.

The Water Programme follows the DPSIR model (Drivers, Pressure, State, Impact, Response). According to the DPSIR framework there is a chain of causal links starting with *'driving forces'* (economic sectors, human activities) through *'pressures'* (emissions, waste) to *'states'* (physical, chemical and biological) and *'impacts'* on ecosystems, human health and functions, eventually leading to political *'responses'* (prioritisation, target setting, indicators) (Kristensen, P., 2004).

9.4.2. Drinking Water

The standard for the drinking water is high quality and is set by the Swedish National Food Administration. To monitor the quality of the water, a thousand samples are taken every year in the waterworks, the distribution systems as well as in the taps.

Lake Mälaren and Lake Bornsjön are two main source of drinking water. Several analytical methods are used to prevent pollution, and samples are frequently taken to monitor the quality of the water. There are also regulations regarding what industries, farmers and private persons are allowed to do in the areas surrounding the water works. (http://www.stockholmvatten.se)

Lake Bornsjön, is the reserve water source, and is restricted area. It has water of drinking quality without any treatment process. (Ibid)

9.4.3. Waste water treatment

Henriksdal waste water treatment plant is one of the world's largest underground treatment plant. It is necessary to treat the waste water coming out of industries or home to be treated before it is finally discharged into natural water bodies. Treatment becomes necessary because the waste water contains nutrients which give rise to problem of eutrophication besides other problems. Stockholm Vatten[21] continuously works to reduce the impact that the organic substances, phosphates and nitrogen will have on the environment. "At least 95 percent of the organic substances and 98 percent of phosphates, plus at least 50 percent of the nitrogen are removed during purification, thus satisfying the demands of the authorities" (http://www.stockholmvatten.se).

[21]Stockholm Vatten AB (the Stockholm Water Company) is municipally owned and runs the operations of water and wastewater treatment.

10. COMPARATIVE ANALYSIS

Parameters	India	Sweden	Comments
Nature of pollution control laws	Not one comprehensive Law	Though not completely comprehensive but Swedish Environmental code has been comprehensive to a great extent.	Water has to be seen as a part of environment. A comprehensive law covering all sectors of environment is better
Contents of law	Good	Better	Laws are to be framed in manner which meets the entire problem
Implementation of law	Poor	Better	A good law becomes futile if there is no effective implementation
Implementation body	The CPCB and respective SPCB	By the various government agencies with help of regional offices in county administrative board	Pollution control regime is in more decentralized pattern in Sweden
Unit of governing water resources	State	River basin district	Water governance on basin wise covers the entire water bodies giving a better management of resources.
Role of municipalities	Municipality is in charge of clean drinking water and sewage treatment at local level but also contributor of pollution	Municipalities in charge of supply and sewage treatment. The yearly report has to cover many aspects of water and land	The defaulting of law cannot be violation of law. Strict punishment should be prescribed for such violators
Quality of water	Varies from one water body to other. Cases of rampant water pollution by industries are still prevalent.	Generally good but suffers from problem of eutrophication and physical alteration in some parts.	While Sweden is struggling against micro level pollution but India has not been able to control even the macro level pollution.
Dispute settlement process	Pollution control board Appellate authority High Court Supreme Court	County Admin Board Environment Court Supreme Envt. Court Supreme Court	The courts in Sweden are more specialized body dealing only with environmental matters
Environment Impact assessment	Not part of legislation but by notification brought into existence. Tourism exempted from EIA.	Part of Swedish Environmental Code. Activities having minor threat to environment exempted.	Any kind of exemption cannot be given with regard to activities related to water.
Principles of Governance	Theoretically exist but in practice not very effective	Good	Principles of governance are effective tool in control of water pollution
Method of pollution control	Generally approach is adherence to Emission standards	Combined approach of emission and control and setting quality standards.	Combined approach is better.
Incentives for following the pollution standards	No	No	Incentives gives motivation to the polluters to adhere to the standards

Table 3: Comparative Analysis of India & Sweden

10.1. Nature of Pollution Control Laws

Both India and Sweden do not have any one comprehensive law which is sufficient to manage water resource. In India apart from the statutory laws, judiciary also plays a vital role in prescribing the rules and regulations. Sweden has consolidates most the laws related to environment into one comprehensive legislation, the Swedish Environmental Code. It is little better approach because water pollution cannot be dealt in isolation with other sectors of environment.

10.2. Contents of Law

Any law should be capable enough to deal with purpose for which it has been brought into existence. This can be achieved if the law is good.

10.2.3. India

The various laws in India dealing with water pollution are drafted in a manner which is sufficient to control and prevent water pollution. They have the provision of setting standards, inspection, licensing, permit, penalty, reporting. This is all what is required for dealing with water pollution. For the prevention and control of water pollution the SPCB has been vested with wide powers.

Power to obtain information - Section 20

The SPCB can survey any area and keep records of the flow or volume and other characteristics of a stream or well. Any person who is abstracting water from any such stream or well or is discharging sewage or trade effluent into any such stream or well, may be asked to give such information as to the abstraction or the discharge in the form prescribed. The SPCB is also empowered to give directions to any person in charge of any establishment where any industry, operation or process, or treatment and disposal system is carried out, to furnish all information regarding the construction, installation or operation of such establishment or of any disposal system or of any extension or addition thereto in such establishment.

Power to take samples of effluents for Analysis (Section 21).

The SPCB or any officer authorised by the SPCB can take samples of water from any stream or well or samples of any sewage or trade effluent, for the purpose of analysis as per the procedure laid down.

Power of entry and inspection (Section 23).

Any person empowered by the SPCB can enter any place at any time for the purpose of—

- Performing any of the functions of the SPCB entrusted to him;
- Determining whether the provisions of the Water Act, the rules made there under, or any notice, order, direction given is complied with or not;
- Examining any plant, record, register, document or any material object or for conducting a search of any place in which he has reason to believe that an offence under this Act or rules made there under is being committed and for seizing any such plant, record, register, document or other material object if he has reason to believe that it may furnish evidence of the commission of an offence punishable under the Water Act or the rules made there under.

Power to Impose restriction on new outlets and new discharges (Section 25)

Section 25 of the Water Act prohibits persons from —

- Establishing or taking any steps to establish any industry, operation or process or any treatment and disposal system or an extension or addition thereto, which is likely to discharge sewage or trade effluent into a stream or well or sewer or on land, without the previous consent of the SPCB.
- Bringing into use any new or altered outlets for the discharge of sewage, without the previous consent of the SPCB.
- Beginning to make any new discharge of sewage without the previous consent of the SPCB.

The SPCB may grant permission for such activities after due inquiry or refuse permission stating reasons.

In *Narula Dyeing & Printing Works* v. *Union of India* the Court held that obtaining a consent order from the SPCB does not mean that the industry is entitled to discharge trade effluents into stream. It is incumbent upon the industry to comply with all the conditions prescribed in the Consent order within the stipulated time limit. Failure to fulfill the conditions will result in the lapse of the consent.

In *A.P. Pollution Control Board II v. M.V. Nayudu* the court held before consent of the Pollution Board is obtained, neither can the industry be established nor any steps can be taken to establish it.

Power to refuse or withdraw consent for establishment of any industry (Section 27).

The SPCB shall not grant its consent for the establishment of any industry, operation or process *etc.* unless the industry, operation or process *etc.* is so established as to comply with all the conditions imposed by the Board. The SPCB may from time to time review any condition and may require the person to whom the consent is granted to make reasonable variation of such condition or the SPCB may revoke any such condition.

In *Mahabir Soap and Godakhu Factory v. Union of India* the State Pollution Control Board refused consent to the continuation of industry on the ground that factory is located in the populated area and there was a public complaint. It was held that the reasons cited by the SPCB are in conformity with the object of the Act. The Court further held that the refusal is in the discretion of the SPCB and it is not for the Court to go into the propriety of reasons and substitute its own opinion in place of the decision of the SPCB.

Emergency operations in case of pollution of stream or well (Section 32).

If it appears to the SPCB that any poisonous, noxious or polluting matter is present in any stream or well or on land by reason of discharge of such matter in such stream or well or on such land or as entered into that stream or well due to any accident or other unforeseen act or event, the SPCB may for reasons recorded in writing carry out certain emergency operations for all or any of the following purposes:

- Removing that matter from the stream or well or on land and disposing it off in such manner as the Board considers appropriate;
- Remedying or mitigating any pollution caused by its presence in the stream or well;
- Issuing orders immediately restraining or prohibiting the persons concerned from discharging any poisonous, noxious or polluting matter into the stream or well or on land or from making insanitary use of the stream or well.

Power to give Directions (Section 33A).

The SPCB may, in exercise of its powers and performance of its functions under the Water Act, issue any directions in writing to any person, officer or authority, and such person, officer or authority shall be bound to comply with such directions. The power to issue directions includes the power to direct:

- the closure, prohibition or regulation of any industry, operation or process; or
- the stoppage or regulation of supply of electricity, water or any other service.

In Re: Bhavani River Shakthi Sugars Ltd the Supreme Court upheld the order of closure made by the SPCB. The Pollution Control Board issued directions to the Sugar Industry for proper treatment of the effluents and for ensuring proper storage of effluents in lagoons. Due to noncompliance of the conditions prescribed by the SPCB the effluents reached the River Bhavani and polluted its water. Since the industry did not take any remedial steps despite enough time granted by the PCB, the SPCB order the closure of the industry.

Corporate liability under the Water Act - Section 47 & 48

Where an offence under the Water Act has been committed by the Company, every person who at the time the offence was committed was in charge of, and was responsible to the company for the conduct of the business of the company, as well as the company shall be deemed to be guilty of the offence.

Where any Department of Government has committed an offence under the Water Act, the Head of the Department shall be deemed to be guilty of the offence.

In *UP Pollution Control Board v. Mohan Meakins Ltd.* the Special Leave Petition before the Supreme Court was for setting aside the trial related to the discharge of trade effluents by an industrial unit in river Gomathi. The directors of the company in this case were guilty of offence under Section 47 of the Water Act. The Court observed that the discharge of noxious polluting effluents into streams inflicts injury on the public health at large and causes irreparable impairment on the aquatic organisms and imposes deleterious effect on the life and health of animals directed the lower Court to proceed with the trial and dispose with the same as expeditiously as possible.

Enforcement of the Act

For the enforcement of the provisions of the act any individual person or the board can approach a court.

10.2.4. Sweden

The Swedish Environmental Code is only the fundamental environmental rules that are included in the Environmental Code. More detail provisions are laid down in ordinances made by the Government (Preface to the Swedish Environmental Code). The similar rules in previous statutes have been replaced with common rules. The translated version of the code takes into account the amendments made up to 1 August 2000 (Ibid). The objective of

Code is to protect and preserve the environment promoting sustainable development. It specifically states that *"the use of land, water and the physical environment in general is such as to secure a long term good management in ecological, social, cultural and economic terms"* (Chapter 1, S.1 (4) of the Code).

Water pollution directly affects our health and environment. In this regard developing individual responsibility for care and protection is essential. As a general rule any person who do or intend to do any activity is expected to possess the knowledge of its likely effect on the environment. He is expected to implement protective measures, comply with restrictions and take any other precautions that are necessary in order to prevent, hinder or combat damage or detriment to human health or the environment (Chapter 2 S.3 of the Code) and in case of failure to comply with shall be liable for the damages. He is responsible not only for the damages caused but also responsible till the damage ceases (Chapter 2, S. 8). Thus the cost of restoration of environment to its original form as far as possible is also to be borne by the pollutor.

The general approach in control of water pollution is to take remedial steps after the damage has occurred. But such a post damage action could be disastrous and as such the Swedish Environmental code adopts both the precautionary and preventive step. It obliges the government or anyone not to use water areas in the manner they feel like. Water areas are to be used in the manner which are best suited in view of their nature and situation and existing needs and is to be protected against measures that may significantly affect their character (Chapter 3). Development projects or other environmental interventions may only be undertaken in reserved areas (Defined in Chapter 4 S.2 of the Code) where they does not cause significantly damage to the natural and cultural assets of these areas.

Giving effect to the EU Water Frame Work Directive

Chapter 5 of the Swedish Environmental Code has been incorporated to give effective implementation to the EU water Framework Directive. In order to find a solution for a problem it is necessary to quantify the problem, set targets to be achieved in a given period of time. To give effect to the directive Government may instruct a public authority to issue environment quality standards, set environmental action programme. These standards and action programmes is to be attained in a stipulated period of time. The Municipalities and the public authorities have not just been imposed the duty of compliance with the environmental quality standards but they have also been empowered

to take decisions, supervision, issue rules. Such an empowerment is necessary because no legislation can be full proof method to be suited for changing environmental conditions. In such a situation waiting each time for new laws to be enacted is only going to exaggerate the problem and flexibility becomes necessary for speedy remedy.

The action programme becomes warranted in the case of failure to comply with the environmental quality standards for a geographical area because the environment is being affected by trans-boundary activities (Chapter 5, S.5 of the Code). For any action programme, it is necessary to consult the affected stake holders. Consultation with the stake holders helps in adapting a better action programme and finds more effective solution. The review of the action programme is also necessary because what is perceived a problem today it may not be same tomorrow and vice-versa. The action programme is subject to review every five years. The county administrative board may also designate surface water or the groundwater as a water protection area for the preservation of existing water stocks (Chapter 7, S. 21 of the Code).

Part five of the code (Chapter 26 – 28 of the Code) further strengthens the implementation of EU WFD. For the prevention and control of water pollution it is necessary that there is compliance with the laws. To ensure compliance with any law it is necessary there is effective supervision. For this purpose the code obliges the supervisory authority to supervise compliance with the provisions of the Environmental Code and rules, judgments and other decisions issued in pursuance thereof and take necessary steps. He is entitled to seek the help of the police or public prosecution authorities for the infringement of the provisions of the code. Generally, the Swedish Environment Protection Agency, the Surgeon – general of the Swedish Armed Forces, county administrative boards, and other government agencies and municipalities under the instructions of government play the role of supervisory authority. The supervisory authority can ask for environmental reports, information, and restoration of ecological conditions, impose fine or take any other step necessary for the prevention and control of water pollution.

Management of polluted area

It is the duty of the individual owner or user of the property to notify the supervisory authority of any case of pollution. Persons who are contributory cause of the pollution in particular area or property are liable for the after treatment of such areas. The sale or

transfer of such property does not make the issue suppressed. The liability of after treatment devolves on the person who acquires such property provided he had the knowledge or ought to have known it at the time of acquisition (Chapter 10 of the Code).
If a water area is so seriously affected that it causes serious threat to health and environment the County administrative board may declare such area as an environmental hazardous zone and restriction on the use of such water could be imposed. The treatment process is to be initiated and make it available for reuse. Thus a double duty is imposed on the County administrative board i.e. monitoring of such area and treatment.

10.3. Implementation of Law

From the empirical case studies in India and court cases it is evident that implementation of law is very poor. This is where the Swedish system makes the difference and maintains a good quality of water resources. Law is strictly implemented in Sweden. One possible reason for the poor implementation of law in India could be lack of supervision and corruption in water sector. The major source of pollution in India is the industries. As per the law they have to follow the standards set. The fact that there is blatant violation of standards shows enforcement agency is in collusion with industries.
In *Pravinbhal J. Patel* v. *State of Gujarat* the Court found that hundreds of industrial units were engaged in large-scale pollution and had made little or no effort to comply with the law. "Neither the industry, which causes pollution, nor the government nor the GPCB nor the GIDC have paid more than lip service to the Environmental laws.... It will not be wrong to say that the continued violation of the law by the industrial units has become a habit and condoning it by the governmental authorities, a practice." "....Since 1980, till today not a single unit or person has been convicted of having violated any of the pollution laws. In fact, not in a single case have the prosecution proceedings... been completed." ... Later in the judgment the court observed that government has abetted or collaborated with the industry in breaking the law... and that the GPCB had neglected its duties despite citizen complaints.

10.4. Law Implementation body

In India it is the CPCB and SPCB who is generally in- charge of implementing the pollution control laws functioning in a hierarchical manner. Any individual or the pollution control boards can approach the courts for the violation of law. Sweden has

more decentralized mechanism of enforcement. At the national level the Swedish Environment Protection Agency function. At the regional level County administrative boards and the respective municipality play the role. At the local level various water council functions.

10.5. Unit of governance

In India the water is a state subject. Hence the basis of governing water bodies is on territorial basis. The water bodies falling within the territory of a particular state is with the domain of respective State Government. In Sweden all the water bodies have been divided into five river basin district. Thus each basin is considered as one unit. Basin system perceives all the water bodies in one particular basin as a single water resource giving better protection to water bodies.

10.6. Role of municipalities

The general role of municipalities in India and Sweden is to provide good quality drinking water, sewage treatment i.e. to make the water resources pollution free. However in India since the municipalities have very often failed in their duty which is explicit in Courts judgment, hence they play the role of polluters as well.

10.7. Drinking Water Quality

The quality of drinking water varies from one resource to another as there is no uniform standard for the States.

The case of *Consumer Education & Research Society* v. *Ahmedabad Municipal Corporation* defines the drinking water quality status better. In this case the complaint was filed by the Consumer Education & Research Society, a voluntary consumer association and the legal heirs of deceased victims of jaundice caused by hepatitis virus, against the Ahmedabad Municipal Corporation (AMC) and the State Government. The complainants contended that the jaundice epidemic which occurred in the city of Ahmedabad in November, 1993 occurred because of the contaminated supply of drinking water by the AMC.

The case speaks that even the municipalities have not been able to guarantee clean drinking water.

In Sweden the general quality of water resources is good but some of them do suffer from the problem of eutrophication and physical alteration. In Sweden during the Water Week

Festival tap water are being distributed free to the people and message is spread that drinking water in Sweden is of so high quality that people need not go for bottled water. Where Sweden is struggling to control its micro level pollution, India has not been able to overcome at least its macro level pollution.

10.8. Dispute settlement process

The dispute settlement process in both the system is through courts but what appears is that in Sweden the dispute settlement bodies are specialized organs dealing only with environmental matters where as in India it is through the same regular courts. The general procedure in India is the appellate tribunal takes the matter from pollution boards. From there the appeal goes to the High courts and supreme Courts where any other case goes. Hence it seems environment has been treated as a general issue indifferent from any others. Recently environmental courts have been set up in India under National Green Tribunal Act of 2010 but it is still far beyond the reach of common man. They have opened the environmental courts in Delhi and have plan to open in respective State as well.

In Sweden the administrative authorities and municipalities are competent enough to adjudicate on issues of water pollution however it is not the final authority. Appeal against the decisions may be lodged with the competent county administrative board and from there it may be lodged with an environmental court.

However certain decision by a government agency shall be reviewed by the Government (Chapter 18, S.1 of the Code). For a system to be transparent and to avoid any kind of bias it is necessary that the adjudication of disputes is done by an independent body. 'No man shall be judge in his own cause' is the cardinal principle in adjudication of any dispute.

Courts have been considered as specialised organs in resolution of disputes. None other than the Environmental courts could be best suited for cases concerning water pollution. The environmental court is four member body viz the president, who is legally qualified district judge, and environmental adviser and two expert members. Since the environment is best understood by the community people, a representative member from the community should also have been taken.

Appeals from the Environmental Court go to the Superior Environmental Court. However in order to appeal to the Superior Environmental Court a leave to appeal is

required else the judgement of environmental court is binding. The last resort is the Supreme Court but those appeals which in first instance were tried by a municipality or an administrative authority may not be heard (Chapter 23 S.8 of the Code). It may be justified in situations where the municipality and the Superior Environmental Court gave concurrent judgments but what if the judgments of the two respective institutions are conflicting? Since the appeal to Supreme Court goes from the Superior Environmental Court, how does it make difference whether in the first instance the case was tried by a municipality or an administrative authority? Does it mean to say that after the judgment has been delivered by the Superior Environmental Court, the Supreme Court plays the role of municipal or administrative body and then trial commences.

10.9. Environment Impact Assessment

In India environment is not part of the Water prevention and control of pollution act but that does not mean EIA is not part of Indian Laws. EIA has been brought into existence by government notification but what is remarkable is that tourism does not require EIA. Given blanket exemption to tourism sector is a fatal approach as tourism is directly related to water resources.

In Sweden though EIA is part of the environmental code but it excludes activities which have minor impact on water resources. The Code makes mandatory for conducting EIA for activities which require permit but at the same time it makes it discretionary for the government "*where the environmental impact of the activities is likely to be minor*" (Chapter 6, S. 1 of the Code). But how can we know whether the effect is minor or major without conducting the EIA. In the case of water can we allow minor pollution? As the discretion is vested with government to conduct or not to conduct EIA corruption is likely to immerge. Hence a more specified rule of exemption is warranted in order to avoid it.

10.10. Principles of Governance

For the effective implementation it is necessary that the general principles of governance are being followed. The fact the water pollution control laws are poorly implemented in India speak for itself that the principles of governance is not being followed giving rise to mismanagement of water resources and also giving space for corruption. Sweden has able

to effectively implement the law for the simple reason that their governance is better. It is based on participatory approach.

10.11. Method of control of Pollution

India the method adopted is generally to adherence to pollution standard. Whereas Sweden has prescribed not only adherence to pollution standard but also quality standard for water bodies has also been followed. Thus emission check coupled with monitoring of water quality gives a better protection. Though in India the pollution control board does check the water quality but there is no uniform standard. Each state has its own standard.

10.12. Incentives for following the pollution standards

Neither India nor Sweden gives incentives for following the pollution standard. An incentive approach gives motivation to the polluters' to adhere to the standards.

11. DISCUSSION AND CONCLUSION

On the basis of case studies, existing literatures and case laws and personal communication with the experts working in the field of water it is not difficult to conceive that legal regime governing water pollution control in India has miserably failed. Sectorial approach to water management is quite evident. On the other hand Sweden has shown a remarkable change with regard to environment management. A comprehensive law has been adopted in consonance with EU water Framework Directive. Though Sweden is not facing the problem of water pollution at macro level but still they are struggling to make water resources a zero pollution zone. The problem of Eutrophication still persists here which changes the quality of water bodies.

The fact that people in India have to approach courts time and again for protection of water resources is self-explanatory that the legal regime in India has utterly failed to protect the water resources from being polluted. But why has such a situation arose? Is it because the laws are inherently weak or is it because of the poor implementation. Well, it would not be just to blame the laws. Though water pollution control laws in India are not integrated and a comprehensive law as Swedish Environmental Code is warranted to avoid the sectorial approach in governance of natural resources but what is more need is the effective governance.

Studies reveal there is gross failure of institutions to protect water quality and livelihood of persons relying water based resources. Case studies from Eloor, Kerala and Hussainsagar, Hyderabad highlights the indifferent approach of the State and industries towards protection of water bodies. "While people have been protesting for decades, the industry, the Government and the pollution control agencies have all ignored their demand for justice until threatened by a high power judicial committee (Suchitra, M.; 2008)." What is thought provoking is that if a pollution case is approaching the courts the situation is at its height. At this stage even a lay man can make out that there is a problem because it is apparently visible and it is not the sincerity of the pollution control boards coming into action at this stage but is rather their gross negligence and failure of duty. The Pollution control boards are specialised bodies. Such bodies are supposed to regularly check the quality of water as a routine work. The fact that the matter is reported to the Court proves they were indifferent towards their duty from beginning. If such is that attitude of a specialised organ then do we need them at all? Though judiciary has always taken the water pollution cases seriously and issued strict guidelines and directions but why the pollution control board members who were negligent towards their duty not punished. It is the fear of coercion which makes one to adhere to law.

The next issue which arises is why the pollution control board have not been able to effectively govern the water pollution issue. A system is expected to be accountable, efficient and responsive to sustainable development. There cannot be any development at the cost of environment, is worldwide accepted. The failure has been met simply because there has been no accountability. Accountability does not refers to just financial accountability but also accountability in term of work done. Had there been effective supervision and reporting of the work being done by these specialised organs situation would not have arose. Also for the effective governance it is emphasised that policies should be inclusive and participatory. Any law cannot be implemented without the co-operation of the people. Though in India it emphasised on decentralization but still when it comes to implementation of policies a centralised approach is seen. Participation of the people helps in two ways. Firstly they get a chance to be part of system and frame policies as per the need. Secondly since they are part of the system they sensitise other people better on such issues.

In Sweden this aspect they have covered in the law making process itself. Before the law is created the study on area of conflict and interaction with people give a better chance to understand the problem and find a solution. The interest of various stake holders is taken care. The stress is given how people self adhere to law rather enforcement agency running after them. The enforcement agencies do survey the consequence of legal implementation and study whether conflict of interest has been protected. The EU water framework directive has been a path shower to Sweden.

It is not that Sweden has extraordinary laws but the manner in which it is being implemented is commendable. Dr. Bhim Rao Ambedkar, father of Indian Constitution rightly said a good law will bad if wrongly implemented whereas a bad law will still be good if rightly implemented. Effective implementation could be achieved when the principles of Governance is followed.

11.1. Suggestions

Water is vital for all and has to be preserved at all cost as there is no substitute to it. A sustainable development has to be environmentally, economically and socially viable.

For the effective control of water pollution it is suggested

11.1.1. Comprehensive Environment Law –

Natural resources are interlinked with each other. A water tight compartmental law is no more suitable to manage them. The sectorial approach creates a scapegoat for the authorities and not in my domain attitude is not suited for sustainable development. A comprehensive law will integrate all the sectors.

11.1.2. No tolerance in environment matters –

The authorities in- charge of enforcing environment standards have to strictly enforce the laws. An effective supervision of the authorities is required. In case of breach of duties primary action lies against them because they are the environmental watch dogs. The fact that water pollution cases have been reported to the courts justify that regular monitoring of water qualities was not done. If the quality of water is checked periodically and sampled then many of such litigation are easily avoided. The pollution cases are highlighted when issue becomes grave but if perfection is to achieved even the micro level pollution is to be reduced to zero.

11.1.3. Incentives for industries adhering the pollution norms –

The general approach in pollution matters are command and control. If one does not follow the standards they have to face the consequences. But those who follow should also get incentives. This will be motivating others also to follow the norms. The incentives could be a tax rebate, reduced in tariffs for raw materials or in any other form by which an industry may also benefit.

11.1.4. Governance not Government needed for control of water pollution –

As discussed earlier government is an actor to governance. For effective control of water pollution good governance is needed. Thus the principles of good governance are to be strictly adhered.

11.1.5. EIA Compulsory with regard to water

With regard to planned human activities it is necessary to anticipate their effect on aquatic system. Can there be a way to know the impact of human activities on environment? The purpose of EIA is to know the direct and indirect impact of planned activities on water bodies. The EIA report is also of academic importance as the code mandates for its notification (Chapter 6, S.8 of the Code). It also gives input to future research to reduce threat posed by such activities. In such case non conduction of EIA for minor activities will skip the invitation of research in that area and target of reducing water pollution to zero may not be achieved successfully.

11.1.6. Efficacious Dispute resolution process

The success of any institution depends upon how effective is its dispute resolution process. A system which invites multi participation of stake holders disputes are likely to arise. Hence it becomes necessary to have an efficacious dispute resolution. The environmental courts must have judges and experts specialized in the environmental field. The courts should be accessible to all conveniently.

11.1.7. Participatory and Inclusive approach –

More the people have a role in policy making more will be the chance of amicably solving the conflicts. An inclusive approach will not only help people to be part of the system but also sensitize others on this issue.

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