

# Regulatory Protection of the River *Mayur*



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## Background of the Study

Bangladesh is a riverine country and one of the largest networks in the world with a total number of about 700 rivers including tributaries, which have a total length of about 24,140 km (Banglapedia 2006). However many of them are dead and few are leading to death due to the natural processes and more importantly anthropogenic activity to ensure rapid economic development. Khulna, the third largest city of Bangladesh is also experiencing the rapid economic development and urbanization, which have a profound impact on water resources.

The major water related problems in the coastal city and in peri-urban areas include scarcity of potable water, pollution from urban solid waste and wastewaters, salinity ingress in surface and ground water, arsenic and excessive iron in groundwater, and flooding and water logging. NGO and civil society representatives indicate that continued water crisis is prevalent all over the Khulna City Corporation (KCC) area. The people of Khulna city are already consuming contaminated water. Freshwater sources have been polluted over the years due to rapid industrialization and unplanned urbanization. The major surface water bodies including *khals* are now water logged or non-existent due to encroachment and waste dumping (Kumar *et al.* 2011).

The *Mayur* river, bordering the northwestern KCC and flowing through the urban and peri-urban areas of Khulna city degrading ecologically by anthropogenic activities. Currently the river experiencing a non-flowing condition. The river originating from *Beel Pabla* is about 11.69 kilometer long and the width varies between 9 and 34 meter. About 30 years ago it was an aggressive river with full of ecosystem services. However the situation has changed when a city protection dam constructed in 1982-1983 by Bangladesh Water Development Board (BWDB), when the river started dying (Karim, 2011).

This river is important from numerous points of views: freshwater reservoir, transport, irrigation water, fishing ground and the city's main wastewater route. The *Mayur* also plays an important role in contributing to ground water table. So management of the *Mayur* can be a reasonable supplementary to water resources of the Khulna City Corporation. Resolving resource use conflicts is essential to ensure the proper management. Administrative tools such as rules and regulation could be the best effective option in resolving conflicts of resource use. This study explores the major administrative tools that we can be used to protect in water resource of *Mayur*.

## Potentiality of the *Mayur*

Groundwater is the only potential source for freshwater in the urban and peri-urban Khulna City Corporation (KCC) (Kumar *et al.* 2011). Khulna City Corporation (KCC) covers an area of about 46 square kilometers with a population of around 1 million as of 2010. The density of the population is 15,429 *per square kilometer* (Karim *et al.* 2011). The water demand was estimated in 2010 as 25,695,648 gallons *per day* (Karim *et al.* 2011). However Asian Development Bank (2010) report estimates that the demand would increase up to 112,992,000 gallons/day during 2030 for an estimated population of 1.62 million. Khulna Water Supply and Sewerage Authority (KWASA) supplies about 14,695,864 gallons of water per day currently. Khulna WASA supplies water from 69 boreholes within KCC area. The water sources include 10,000 private tube wells providing an additional supply of 60 MLD. However, currently KWASA does not have any surface water reservoir for water supply (Karim *et al.* 2011).

The present water supply network of KWASA covers only about 30% of the total city population. In the peri-urban areas, community tube wells are used for collection of drinking water. Besides, surface water from nearby ponds and *khals* are used for washing, bathing and other domestic purposes. Field survey result shows that peri-urban residents have limited access to safe drinking water even women and children, have to walk a long distance (1-5 km) to fetch potable water (Kumar *et al.* 2011).

At present the entire water supply system in the KCC area is groundwater based with deep tube wells having depths greater than 300 m. A large number of privately owned tube wells are also present in and around. As a result, the groundwater table declines significantly during the dry period (March-May), consequently the wells provide limited or no water during the dry period (Kumar *et al.* 2011). KWASA has already restricted installation of deep tube wells in KCC. Among other efforts to resolve the water scarcity, KCC has been trying to transport water from the peri-urban areas such as *Fooltala* and from *Madhumati* river, far from the city. This may restrict future water access and security of the peri-urban people and their traditional livelihood and resources.

Ground water quality in KCC area has been deteriorating over last couple of decades and quality of ground water is not qualifying for the standard (in terms of Total Dissolved Solid- TDS) for supply of potable water (Karim *et al.* 2011). The quantity of ground water is as well not enough to satisfy the demand of KCC and the adjoining areas. In such situation turning towards surface water may be a reasonable option. The River *Mayur* can play an important role being as a fresh water reservoir in such

circumstances. Karim *et al.* (2011) estimates that the *Mayur* river can reserve up to 725,732,265 US gallons of water. Moreover, this river is now almost a closed water body. So this river can be used as a reservoir and by applying treatment facilities sustainable water supply system can be ensured for KCC.

## Conflict among the resource user

Resource and conflict are the two sides of a coin. Competition over scarce resources is often the cause of conflict. Improper management often creates social discrimination which triggers the conflict in the society. Water conflict among different users is more complex in peri-urban Khulna. The nature and dynamics of these complexities mainly depend on social, economic and political factors. Broadly we can categorize two types of conflict, one is internal which include the conflict among resource user i.e. direct stakeholder and the other is external refers to the institutional conflict that takes the responsibilities of the management.

Agriculture is the dominant land use in the peri-urban areas of Khulna. The *Mayur* River plays an important role in providing irrigation water for peri-urban agriculture. However, farmers at the downstream sites claim that they suffer because of non-responsive gate operation of the *Alutala* sluice constructed at the confluence with the *Rupsha* River to control salinity intrusion into the *Mayur* River. The *Mayur* river system is the only major freshwater source in the area for irrigation, and farmers on both side of the river depend on this river for the purpose. The *Mayur* was experiencing natural tidal flow that having significant importance for agriculture, fisheries, navigation and potable water use. The contribution of *Mayur* to such important livelihood activities diminishes after construction of the *Alutala* 10-vent regulator and a city protection dam by the Bangladesh Water Development Board (BWDB) during 1982-1983. These structural interferences to the river flow have dwindled and confined the hydro-dynamics of the *Mayur* that resulted along with the natural processes into a moribund river. Thus the river is currently a stagnant water body used by the local power elites for culture fisheries. The *Alutala* gate is operated to serve the culture fisheries, not agriculture claimed by the local farmers at *Chhoto Boyra* (Kumar *et al.* 2011).

Moreover NGOs and civil society representatives believe that the Khulna City Corporation (KCC) is trying to withdraw water from *Fultala* (a peri-urban area of KCC) without any environmental impact assessment. This may lead to a unmanageable social conflict between urban and peri-urban. However, it may be possible to solve water crisis of Khulna city by using the *Mayur* River as a water reservoir (Kumar *et al.* 2011).

## Genealogy of laws and policy regarding water resources in Bangladesh

The Environmental Pollution Control Ordinance 1977, Ordinance No. XIII was the first attempt to protect the environment especially the water sector in Bangladesh. It superseded the Water Pollution Control Ordinance, 1970 (East Pakistan Ord. No. V of 1970) and extended the control, prevention and abatement of pollution to the entire environment of Bangladesh and expanded the definition of “pollution” from that specifically relating to waters to “air, water or soil”. It also further included “contamination or other alteration ... likely to, create a nuisance or render such air, waters or soil harmful to ... bonafide uses “ and to *plants and forms of life* other than those previously specified. The 1977 Ordinance also reconstituted the Environmental Pollution Control Board with a similar mandate to that detailed in the 1970 Ordinance but extending to pollution of air and soil and giving the Board the power to appoint expert committees as they deem necessary (Clemett, 2004).

Since its inception in 1977, the Environmental Pollution Control Board was assisted by a ‘Pollution Control Cell’ to specifically focus on the pollution control activities of the Board. Subsequently, the responsibilities of the Pollution Control Cell were enhanced and ultimately it grew into the Department of Environmental Pollution Control in 1985, which was renamed as the Department of Environment (DOE) in 1989. During the same year, the government abolished the Environmental Pollution Control Board and established a separate Ministry of Environment and Forests (MoEF) under the central government for the purpose of planning, promoting, coordinating and overseeing the implementation of emerging environment related matters in Bangladesh. Since the creation of MoEF, the DOE became the primary organization for environmental management and pollution control in Bangladesh (Rahman, 2011).

The Environment Policy of 1992 of Bangladesh has recognized the need for a better and comprehensive approach to address environmental issues. It requires specific actions in the development sectors of the country to facilitate long-term sustainable use of all natural resources. In the industry sector, it provides for Environmental Impact Assessment for new industries, corrective measures for polluting industries, a ban on establishment of polluting industries, and development of environmentally sound and appropriate technology for sustainable and efficient utilization of natural resources (Islam *et. al.* 2001).

The National Environmental Management Plan (NEMAP), 1995 was developed as the framework of programmes and interventions aimed at implementing National Environmental Policy (NEP). Its activities attempt to lead better management of scarce resources, reducing the rate of environmental degradation, improving the natural and man-made environment, conserving habitats and biodiversity,

promoting sustainable development and improving quality indicators of human life. NEMAP proposed actions and interventions for government agencies, NGOs and wider civil society and include activities relating to fisheries and agriculture (MoEF, 1994).

Subsequently, as a response to the NEP-1992, the government abolished the EPCO-1977 through the Bangladesh Environment Conservation Act 199 in the parliament. This Act provided the basis to enact the Environmental Conservation Rules (ECR) by the government in 1997. These are considered as the most important legislative documents pertaining to water pollution abatement in Bangladesh. The ECA-1995 primarily clarified DOE's mandate and strategies for pollution control. This included defining the functions of the DOE and providing this organization with considerable power regarding environmental preservation; and prescribing a penalty system in case of non-compliance of the environmental procedures by an individual or a company. Besides, the ECR-1997 provided additional guidance for specific components of the ECA-1995 and made some major contributions in pollution control. This incorporated the development of Environmental Quality Standards (for both ambient and effluent quality) and formulation of procedures for obtaining the environmental clearance certificate by the industrial establishments (Rahman, 2011).

The Environmental Court Act 2000 supports the Environmental Conservation Act (1995) and the Environmental Conservation Rules (1997) and establishment of environmental courts for the trial of offences relating to environmental pollution. It includes protocols for the establishment of the court, and defines the court's jurisdiction, appropriate penalties, powers of search and entry, and procedures for investigation, trial and appeal. The Environmental Conservation Act, 1995 and the Environmental Court Act 2000 were amended in 2002 and the Environmental Conservation Rules, 1997 were extended to incorporate ambient air quality and exhaust fan vehicles (Clemett, 2004).

## Laws and regulatory measures regarding open water bodies in Bangladesh

To ensure the proper protection of the open water bodies in Bangladesh, implementing rules and regulation is very important and hence it is necessary to evaluate the effectiveness of the existing management practices. To ensure the proper management and implementation the regulation, several aspects such as relevant national policies, legislative framework, organizational capacity, monitoring and enforcement status and extent of public involvement etc. are very important.

There have several legislation exist through which an open water body can be manage properly. The major legislation regarding open water bodies are listed below:

**The Canals Act, 1864:** This act mainly meant to ensure proper navigation of Bangladesh, also known as Bengal Act V of 1864. In order to make the navigation channel smooth, this law ensures the improvement of river, canal, *khal*, *nala* or waterway whether natural or artificial.

Once upon a time our countries communication extensively depends on the water courses. However due to encroachment and pollution and sediment load the rivers have died and navigation communication collapse. By using this law the river paths which already have grabbed, can be revived. According to this law, government/ authority can take possession, as for the public purpose in case of construction and improvement of lines of navigation. However as this law is very primeval, its efficiency is not so high in regarding punishment and proper management.

**The Embankment and Drainage Act 1952:** An Act to consolidate the laws relating to embankment and drainage and to make better provision for the construction, maintenance, management, removal and control of embankments and water-courses for the better drainage of lands and for their protection from floods, erosion or other damage by water.

**The Water Resource Planning Act 1992:** To ensure the water resources development and its optimum utilization, this act passed in 1992. According to this act, a statutory institution entitled Water Resources Planning (WRP) have been established and responsible for water resources planning and development, institutional capacity building, integration among the different institutions in water resources management, awareness buildup in water resource development etc.

**Environment Conservation Act 1995 and Environment Conservation Rules 1997:** The Bangladesh Environmental Conservation Act passed in 1995, and the accompanying Environment Conservation Rules 1997, are arguably the most important legislative documents for industrial water pollution. The Act is dedicated to the “conservation, improvement of quality standards, and control through mitigation

of pollution of the environment". The 1997 Environment Conservation Rules made in accordance with the 1995 Act provide additional guidance for specific components of the Act. The Act is in theory enforced by the DoE, which has responsibility for:

- Coordinating with other authorities or agencies that have relevance to the objectives of the Act.
- Adopting safety measures and determining abatement measures to prevent accidents that may cause environmental degradation.
- Advising persons on environmentally sound use, storage, transportation, import and export of hazardous material or its components.
- Conducting research and assisting other authorities and agencies in conservation and improvement of the environment.
- Investigating locations, equipment, manufacture or other processes, ingredients, or materials, to ensure improvement of the environment, and control and mitigation of pollution.
- Collecting, publishing and disseminating information regarding environmental pollution.
- Advising the Government on manufacturing processes and materials that may cause pollution.
- Ensuring potable water quality.

In order to enforce the Act, the DoE has the right to enter, investigate, test, examine and seize, industrial plants, equipment, records, registers, documents or other significant objects, and to search places where it is believed an offence has occurred in contravention of this act. In addition, the DoE is empowered to collect water, air, soil or other material for analysis in the presence of the occupant and under conditions laid down by the Act. Should any plant or process be found to be contravening the rules of the 1995 Act, the DoE is empowered with to enforce the Act through closure, prohibition or regulation of industries, initiatives or processes after due notification to the owner of the industry or process. The DoE can also initiate public hearings if an application is submitted by an individual or group of individuals who are being, or are likely to be, affected by pollution or degradation of the environment. Since the gazette of the 1995 Act, all industrial units or projects must obtain "Environmental Clearance" from the DoE. For the purpose of Environmental clearances all industrial units and projects have been divided into four categories depending on environmental impact and location. In order to obtain Environmental Clearance, industries within these categories must submit applications containing several forms of documentation. Once Environmental Clearance has been granted it is valid for a period of 3 years for Green Category industries and 1 year for all other Categories. Applications for renew must be made within 30 days before expiry (Clemett, 2004).

**Environmental Court Act 2000:** In the year 2000 the government established the Environment Court Act (ECA) to provide a foundation for the formation of environmental benches in Bangladesh for the trial of offences related to environmental pollution. The ECA-2000 includes protocols for the establishment of the court, and defines the court's jurisdiction, appropriate penalties, powers of search and entry, and procedures for investigation, trial and appeal. Later on, the ECA-1995 and the Environment Court Act-2000 were amended in 2002 and the ECR-1997 was extended to include some other provisions such as certificate of fitness, pollution under control certificate etc (Rahman, 2011).

**Bangladesh Water Development Board Act 2000:** Bangladesh Water and Power Development Boards Order, 1972 (P. O. No. 59 of 1972) has been stopped by this act and Bangladesh Water Development Board (BWDB) has been established. The BWDB is responsible for the total management of the open water resources sector in Bangladesh.

## Laws and regulatory measures regarding close water bodies in Bangladesh

**The City Development and Conservation of Natural Wetland Act 2000:** This is the 36th law in 2000 and has passed to protect the playing ground, open place, park and natural water bodies in the city area. By this law, the natural water bodies including the river, lake or any water bodies recognized in the master plan, formulated by different city or town authority, will be protected. This law is applicable for both private and public property and authority has the power to demolish the unauthorized construction. Authority can also seize the unauthorized infrastructure if court ordered. Violation of this law, penalty imposed imprisonment not exceeding 5 years or fine not exceeding BDT 50,000 (Taka Fifty Thousand Only) or both and a first class magistrate or in metropolitan area metropolitan magistrate can charge this fine.

**Jalmahal Policy 2009:** The Ministry of Land formulates *Jalmahal* Policy 2009 to ensure the distribution of the close and open water bodies for the real fisheries dependent people to earn revenue along with the fisheries resources conservation and development with biodiversity conservation. According to this law, the *Jalmahal* define as either close or open water body where round the year or a portion of the year water exist, which may call as river, pond, lake, canal etc. Different committee such as National *Jalmahal* Management Committee, District *Jalmahal* Management Committee and *Upazila Jalmahal* Committee

headed by Honorable Labour Minister, Deputy Commissioner, and UNO, respectively responsible for the management of the *Jalmahal*.

Although revenue earning and development of the fisheries dependent people's livelihood are the main concerning matter in this law; however a few obligation also exist there to ensure the sustainable development including the irrigation facility from these water bodies, protect the mother fish etc.

## Competence of the present legislation to protect Mayur

Only before about 30 years from present the *Mayur* was a live river with full of ecological services including source of irrigation of the surrounding agriculture, navigation channels, fishing ground and place of entertainment (Karim, 2011). But, unplanned development projects like embankments and illegal activities such as drain site effluents as waste drainage system and encroachment of *Mayur* rendered the river to the fate of current fatality. Although people's awareness and institutional management can ensure the proper management of this water body in the long run but presently, strict enforcement of laws and legislation is the only way to revive this water body to ensure the future water security. Here we discuss how the present law and legislation can prevent some of the major devastating activities.

**Pollution load and solid waste disposal:** Pollution load is one of the main reasons for the annihilation of the ecosystem services of this water body. Dumping of waste and effluents with high nutrient contents is responsible for the eutrophication which leads the annihilation of the habitat of the aquatic species.

There are adequate clauses present in the legislation to protect the pollution in the *Mayur* especially through the Environment Conservation Act 1995. In this act Department of Environment, headed by the Director General (DG) is the responsible authority to protect any kind of pollution.

- In this act under sub-section (1) of section 7, if anything appears to the authority that any act or omission of a person has caused, directly or indirectly, injury to the ecosystem or to a person or to group of persons, compensation may be determined and the person may be directed to pay the same or in appropriate cases to take corrective measures, or do both and the person so directed shall be bound to comply with the direction. Non-compliance of this direction imposed penalty of imprisonment not exceeding 10 years or fine not exceeding BDT 10 Lac or both.
- According to the section 12, no industrial unit or project shall be established or adopted without obtaining environmental clearance from the authority, in the manner prescribed by the rules.

Violation of this section will imposed penalty as imprisonment not exceeding 3 years or fine not exceeding BDT 3 Lac or both.

- In the section 9 include subsection (1) state that, where the discharge of any environmental pollutant occurs in excess of the prescribed limit laid by rule, the person or the in-charge of the place shall be bound to prevent or mitigate the environmental pollution caused as a result of such discharge. Violation of this section with impose penalty as imprisonment not exceeding 10 years or fine not exceeding BDT 10 Lac or both. Besides subsection 2 (a) and (b) under section 20, Government may establish quality standards for water as well regulate the establishment of industry and other development activity to protect the water resources.

There are about 18 city sewage drains disposing waste water directly into the *Mayur* river without any treatment (Mridha, 2011). According to the Environmental Conservation Rules 1997, sewage shall be chlorinated before final discharge as well has to maintain a prescribed standard. Department of Environment is the responsible authority to ensure the safe disposal of waste water into the water bodies. As these drains originates from point sources its management is possible if the concerned authority take necessary steps to establish some treatment plant for the waste water before discharging to the *Mayur*. In this case both the monitoring authority (DoE) and the responsible institution (KCC) need to be concerned on this issue.

**Human interference:** Unplanned urbanization and development are responsible for deterioration of the *Mayur* river ecosystem. Karim *et al.* (2011) has found that on average 31% of the total chanel/valley area of the river have already been grabbed and 22 tributaries of this river (*Khals*) also died up because of the grabbing. About 30 years ago this river was a navigation route for the peri-urban people of the Khulna region (Karim, 2011) but due to the encroachment and effluent/ pollution overload the channel has been chocked and this route have been nonfunctional. In several parts of the river, encroachers blocked the natural flow of water and grabbed the land to fish culture. This river can be easily identified by the Cadastral Survey (CS) of 1913 and Revised Survey (RS) of 1983. As the land is in under the jurisdiction of the Deputy Commissioner (DC) of the respective district, they can restore the grabbed land by the help of law enforcement authority as well as by the DoE and in this case Environment Court Act 2000 can be successfully used to charge the grabbers. Also by using the canals act, 1864, govt. can revive these navigation paths which will take out the *Mayur* River from the clutch of the grabbers and restore the ecosystem.

**Drainage pattern:** The drainage pattern of the *Mayur* River has already been destroyed totally due to land grabbers. From different records it has been found that this river has 22 *khals* and a direct link with the *beel Pabla* (Karim *et al.* 2011). These tributaries kept the river ecosystem its course alive by contributing water. However, due to the encroachment, these *khals* are barricaded and a structured construction has now exist on these grabbed lands. There is no link between the *Mayur* river and *beel Pabla* at present, which indicates that now this river is a close water body (Karim *et al.* 2011). In this issue KCC and DoE can play a very important role. The DC office can file case against the grabbers on the basis of the land laws as the leasing of rivers is strictly prohibited. Since these tributaries are present in the Cadastral Survey (CS) of 1913 and Revised Survey (RS) of 1983, the responsible authority can revive these tributaries and ensure the river flows which may be the only option to breathe life into this river again. However presently the river is suffering from diversion of water to other nearby river and has become an abandoned channel. So this could be a good fresh water reservoir.

**Ecological services:** A river and/or a reservoir have numerous ecological services and the *Mayur* was not the exception in this regard. This river supplied different ecological services earlier but such acts were decreased and river died gradually because of development disaster. The *Mayur* still has the potentiality to serve some of the very important ecological services including irrigation, fisheries, entertainment natural reservoir for water supply, discharge zone of city waste water after treatment etc. This water reservoir also potentially recharges the groundwater in aquifers.

In the *Jalmahal* policy 2009, real fishermen are only allowed to get the lease of govt. owned close and open water bodies which ensure fisheries production moreover secure the real fisher dependent people's livelihood. In this policy the irrigation facilities for the farmers also secure even if the fisheries culture is going on that time.

This river could be the best place for the entertainment to the city dwellers if it can be protect from the pollution discharge and the aesthetic views to be protected as the Environment Conservation Act 1995 and city wetland conservation act 2000 must be implemented with the help of the Environment Court Act 2000. Moreover, if the waste water can be treating that comply with the standards of Environmental Conservation Rules 1997, then this river can be used as a discharge route of the city waste water.

**Landscaping:** The change of landscape because of unplanned development is another reason responsible for deterioration of *Mayur* ecosystem. Encroachment and rapid conversion accelerate the destruction of habitat in the *Mayur*.

- As the major portion of the *Mayur* drainage basin is located within KCC, execution of the 'City Development and Conservation for Natural Wetland Act 2000' can protect the change of the landscape. According to this law, without the permission of the authority no change would be allowed for natural water bodies included in the master plan.
- According to the ECA 1995 under section 6(5), natural water body can not be converted to another form of land type. Violation of this section of act, first time penalty imposed as imprisonment not exceeding 2 years or fine not exceeding BDT 2 Lac or both and from next imprisonment not exceeding 10 years or fine not exceeding BDT 10 Lac or both.

## Responsible authority to protect the water bodies in Bangladesh

In Bangladesh there is no specific statutory authority solely responsible for the management of water bodies. Different institutions have conflicting types of responsibilities on multidimensional problems. Integration among the institutions is absent not even cooperation. As a result problems remain unresolved.

The government agencies responsible for protection and development of water bodies includes 13 ministries and 35 organizations, the most important among which are the Ministry of Water Resources, Bangladesh Water Development Board, Water Resources Planning Organization (WARPO), Joint Rivers Commission, River Research Institute, Surface Water Modeling Centre, Bangladesh *Haor* and Wetland Development Board, Ministry of Agriculture, Bangladesh Agricultural Development Corporation, Ministry of Local Government, Rural Development & Cooperatives, Local Government Engineering Department, Department of Public Health Engineering, Dhaka Water Supply and Sanitation Authority, Chittagong Water Supply and Sanitation Authority, Ministry of Environment and Forest, Department of Environment, Ministry of Ports, Shipping & Inland Water Transport, Bangladesh Inland Water Transport Authority, Ministry of Fisheries & Livestock, Department of Fisheries, and Disaster Management Bureau. The local government institutions are the *Paurashava* (municipalities) and the *Parishads* (councils, mainly the *upazila parishads*) are also part of the management of water resources (Banglapedia 2007).

Despite the fact that lots of institutions and organizations are playing role in the management of water resources all efforts are failing failure to reach the goal. Most of the problems related to water resources are multidisciplinary so an integrated approach is very important to install where government agencies moved be incorporated under a common umbrella.

The present government of the People's Republic of Bangladesh took an initiative to formulate river commission to protect rivers from the pollution and encroachment. 'National River Protection Commission Bill, 2013' was finally approved by the cabinet on 7<sup>th</sup> January, 2013. Under the law, a five-member commission will be formed for three years comprising one chairman and four members to be appointed by the government. The members of the commission will comprise of experts on river, environment, river engineer or river management, and lawyers having expertise in human rights issues. It is hoped that it would be helpful for taking strong steps in protecting rivers, especially from river pollution and encroachment (The Daily Independent, 2013).

### **Authorization of *Mayur* River**

Although *Mayur* River, a short river with limited drainage extent but its importance is immense because of its location. The BWDB is playing a very important role in the water management but unfortunately this river is not included in the list of BWDB. However the Cadastral Survey (CS) of 1913 and Revised Survey (RS) of 1983, has recorded *Mayur* as river in the *Baniakhamar Mouza*. This river is under the jurisdiction of the Deputy Commissioner of Khulna district. However, for management purpose, different institutions and organizations are responsible as authority in different aspect. In case of pollution control, Department of Environment is responsible to execute enforcement including ECA 1995, ECA 2000 etc to ensure the water standard to ECR 1997. To conserve the river and associated land pattern according to the master plan, Khulna Development Authority and Khulna City Corporation is the responsible authority. KCC is empowered with implementation of City Wetland Conservation Act 2000 to restrict and recover the land encroached in rivers and to restore the master plan formulated by KDA. The KCC, WDB and LGED are responsible for development work of the river and WARPO is responsible for research and planning of the river.

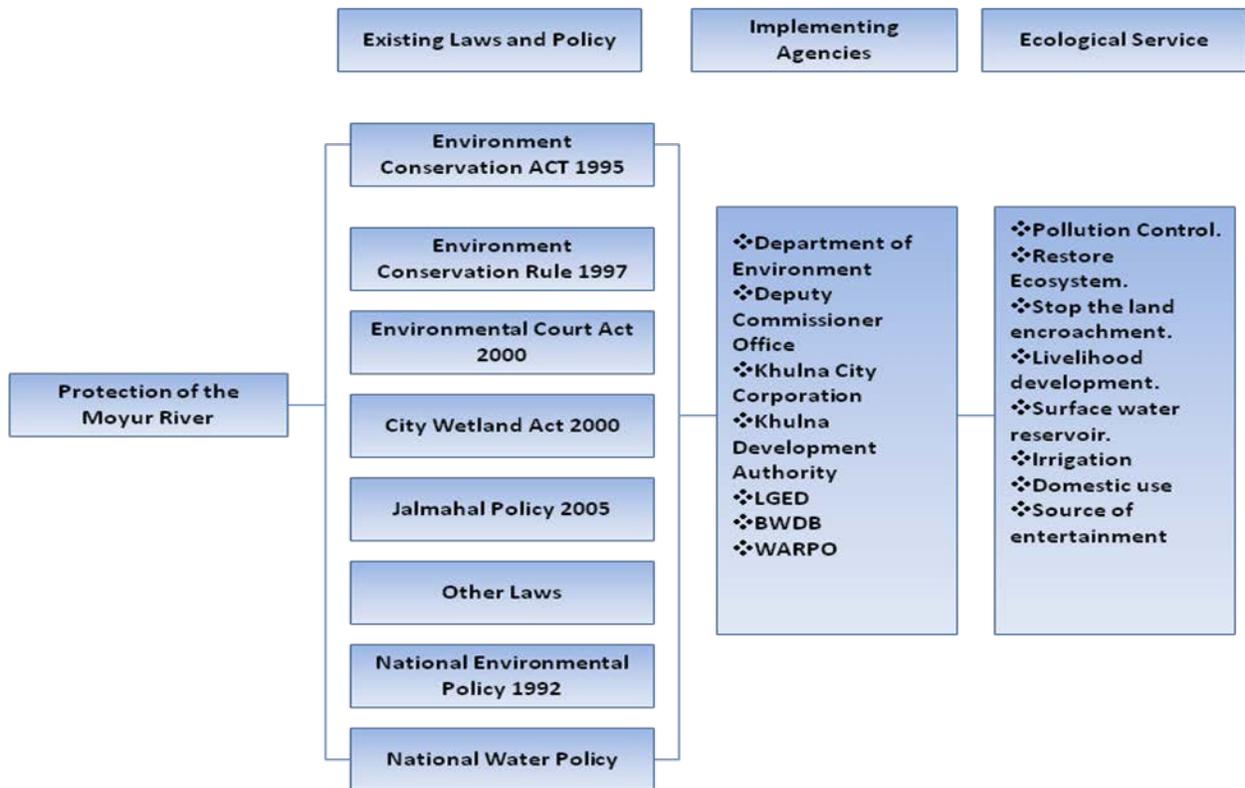


Figure 1: Main Regulations and the Implementing agencies to protect the *Mayur* River

## Possible Options

Rules and enforcement are often regulation is not the best options for the management rather awareness among the resources user is more important to ensure the sustainable management. However, countries like Bangladesh where resource is too scarce and people are not so concern, enforcement of strict rules and regulations is often the only options to conserve the resources and to regulate its optimum use. However for implementation of laws, administration must be sound. Following effort can be carried out to save the *Mayur* and ensure its optimum use under the existing laws.

**Declaration of ecologically critical area:** In ‘The Bangladesh Environmental Conservation Act 1995’ under section 5, if the Government is satisfied that an area is in an environmentally critical situation or is threatened to be in such situation, the Government may, by notification in the official Gazette, declare such areas as ecologically critical and specify the activities or processes that cannot be initiated or continued in an ecologically critical area. According to the Environmental Conservation Rule 1997,

section 3, Government can declare an ECA area considering factors such as wetland, biodiversity etc and some standards also has to comply. Government has already been declared Gulshan-Baridhara lake as an ECA in 26<sup>th</sup> November, 2001 as its ecosystem has reached in vulnerable conditions. Its ecological importance in Dhaka also has been taken into consideration. The *Mayur* has the importance for the KCC and its habitants. This river has already an abandoned channel. Its flow has been diverted and the system is dead as a river. However this system may remunerate as a close water body that reserve fresh water for KCC if properly managed.

**More activity by environmental court:** Most of our laws have some complexities and hence these are time consuming except the Environmental Court Act 2000. According to this act, Environmental Court can solve a case within 45 days with appeal opportunity. The number of environmental court is very few, generally only one in each division. However, such courts could be established more in numbers in each division by notification in gazette. More activity by the environmental court surely would restrict the pollution and encroachment of the river.

**Enhance the collaboration:** A multidisciplinary approach is required for the management of a water body. As such a strong integration is essential specially among the KCC, KDA, Deputy Commissioners office, DoE, LGED, BWDB, WARPO etc for proper planning and implementation.

**Engagement of community and civil society:** community participation with civil society's involvement always appreciated in worldwide for proper planning, implementation and monitoring of water bodies. This has always been ignored in Bangladesh. The involvement of the fisheries dependent people, in the management of the water bodies, in *Jalmahal* policy 2005 offers expectation that community participation in development efforts are important factor. In Khulna, several NGOs, community and civil society are very much concerned and working together to save the *Mayur* from the pollution and encroachment. So, their involvement in the management will definitely contribute to protect this river.

**Awareness buildup:** Awareness among the people is the only options for long term development because the big stick of the law can not work for a long time. Hence awareness among the people is required. Authority should be concerned to inform them about the importance of ecological services of the *Mayur*.

**Extensive Research:** Research is the only way to find out the best option to solve a problem. Proper planning is difficult without research. In such cases researchers from academic institutions may collaborate with government institution for proper dissemination of knowledge.

## **Conclusion**

Bangladesh has adequate laws, regulation and policy for security of water bodies. However, for implementation of these administrative tools, competence of the administration is not supposed to be satisfactory. Strength and integration among the different responsible agencies is required at the foremost. Organizations should be well equipped for proper monitoring and evaluation by recruiting adequate and skilled manpower, proper training, free of bureaucratic complexities and political influence etc with strong policy. However, awareness buildup and community engagement also required for the long term with strict enforcement of laws and regulation. Thus good governess is a must to be ensured.

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