

Status of Biodiversity and Its Conservation in the Kobadak River Basin of Maheshpur Upazila, Jhenaidah, Bangladesh

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Abstract This research project represents the Status of Biodiversity and Its Conservation of Kobadak River basin of Maheshpur Upazila. The study was designed to develop a set of information about the present condition of biodiversity of the study area. Both primary and secondary data have been used to fulfill the survey successfully. Primary data have been collected from focused group discussion, key informant interview and secondary data have been collected from journals, books, websites etc. and maps have been collected from websites. The significant importance of this survey is to conduct with a view to expand our knowledge on biodiversity conditions of Kapotakkho River at Maheshpur Upazila, Jhenaidah. Collected data from the study area indicates that the condition of biodiversity of the area is gradually deteriorating. This study also shows that many species is under threat of extinction. The main causes include pollution and contamination, siltation on riverbed, over-exploitation, and lack of awareness and also include lack of government initiatives and effective steps from NGOs. So, government initiative must be taken to protect biodiversity and maintain environmental balance. This study would help understand the present situation of the study area.

Keywords Biodiversity, Conservation, Deteriorate, Extinction, Over-Exploitation, Pollution And Contamination

1. Introduction

Biodiversity is an asset for a nation. However, population pressure, conversion of forestland and wetland into agricultural land, overexploitation of forest products and excessive withdrawal of water, relentless wetland depletion due to overexploitation of both flora and fauna are causing great harm to our biodiversity. Agro-diversity has been reduced and this limits potential of further growth and development in this sector. At the same time, a large section

of terrestrial diversity of plants and animals is being threatened due to deforestation and conversion of forestland. Similarly, aquatic diversity is also under pressure due to the drying up of rivers, reduction of flow of water in major rivers, and accumulation of pesticide residues in lake waters. Bangladesh is a land of rivers and one of the world's top populous countries in the world. It has become a challenge for her to meet the demands of this huge population. Even if it can do so, but the pressure on the biodiversity has become a great concern. To meet the needs of people there has been a constant pressure on her physical health. There have been many causes behind the damages of the biodiversity. Rivers biodiversity is being damaged in different process. According to this study, many species in Kobadak River has been extinct and many are under the threat of extinction or endangered. Although it would not happen if proper steps were taken timely.

2. Objectives of the Study

The study has been carried out in order to achieve the following objectives:

- To know about the biodiversity condition of the river basin;
- To find out probable causes behind biodiversity loss; and
- Role of Govt. & NGOs potential measures to prevent biodiversity loss

3. Methodology

In this research the data have been collected from both primary and secondary sources. When I want to research about a matter for our work, we have to collect data from primary and secondary sources. Nowadays this is the technique that is followed. This research is primary and

secondary data based. Information was collected from primary data sources as key informant interview, focused group discussion.

Data on biodiversity of Kobadak River has collected by field observation. Primary data were collected from 10th June to 15th June, 2014 at Maheshpur upazila in Jhenaidah district. A questionnaire was developed using open questionnaires. Random sampling method was employed in selecting the sample population from the study area. Informal discussion has done with the respondents related to loss of biodiversity

of the study area. Taking interview of the people living by the side of River and are dependent on the river. Personal observation takes photographs from the surveyed area. Basic knowledge has been earned by literature review, online journals, internet etc. Maps have been collected from Banglapeadia online version.

The secondary data are collected from Internet, Books, Journals and research papers etc. Collected data were stored, explored and analyzed using Microsoft Excel, and Microsoft Word program to present results and discussion.

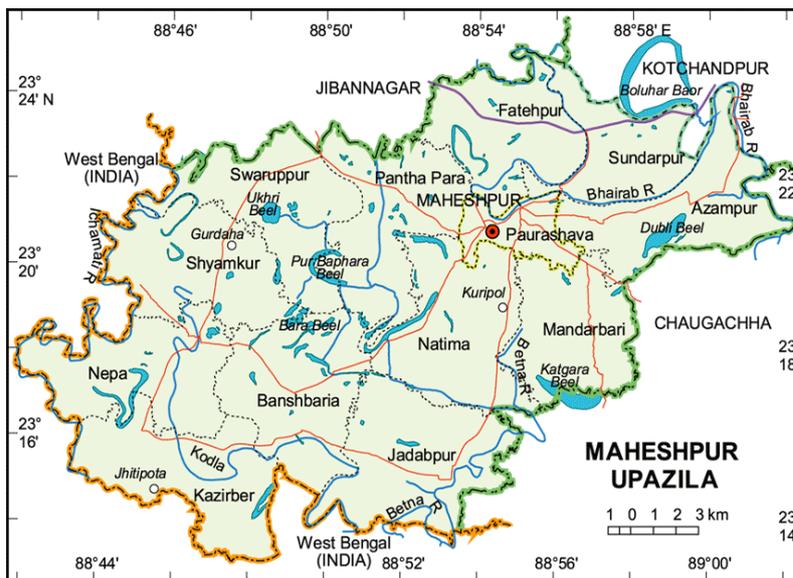


Figure 1. Study area Map (Maheshpur Upazila)

Table 1. Fishes of Kobadak River

SL NO.	Local name	Common Name	Scientific Name	Category
1	Kakila	Indian needle fish	Xenentodon Cancila	Endangered
2	Taki	Spotted snakehead	Channa punctatus	Least Concern
3	Cheng	Walking snakehead	Channa orientalis	Vulnerable
4	Bhol	Barb	Raiamas bola	Critically Endangered
5	Potka Tetraodon	Ocellated puffer fish	cutcutia	Data Deficient
6	Tit punti	Ticto barb	Puntius ticto	
7	Sarputi	Punta Olive barb	Barbodes sarana	Vulnerable
8	Shing	Stinging catfish	Stinging catfish	Endangered
9	Magur	Walking catfish	Clarias batrachus	Vulnerable
10	Tengra	Day's mystus	Mystus bleekeri	Vulnerable
11	Kolisha	Banded gourami	Colisa fasciatus	Vulnerable
12	Choto Kolisha	Dwarf gourami	Colisa chuna	Vulnerable
13	Boisa	Dwarf gourami	Colisa lalia	Critically Endangered
14	Koi	Climbing perch	Anabus testudineus	Critically Endangered
15	Tara baim	Lesser spiny eel	Macrogathus aculeatus	Critically Endangered
16	Rui	Rohu	Labeo rohita	Data Deficient
17	Catol	Catla	Catla catla	Data Deficient
18	Gozar	Great snakehead	Channa marulius	Critically Endangered
19	Kalibaas	Orange-fin labeo	Labeo calbasu	Critically Endangered
20	Snake eel	Longfin snake-eel	Pisodonophis cancrivorus	Critically Endangered
21	Mrigol	Mrigal	Cirrhinus cirrhosus	Data Deficient
22	Pangas	Yellowtail catfish	Pangasius pangasius	Least Concern
23	Bele	Giant mudskipper	Periophthalmodon schlosser	Least Concern
24	Tepa	Ocellated pufferfish	Tetraodon cutcutia	Least Concern

Source: Field Work, 2014

4. Result and Discussion

4.1. Present Status of Biodiversity in Kobadak River

From the mentioned diagram it is noticed that about 86% responded decreased biodiversity in the Kobadak river basin, 8% respondent said that increased biodiversity and 6% comments no change.

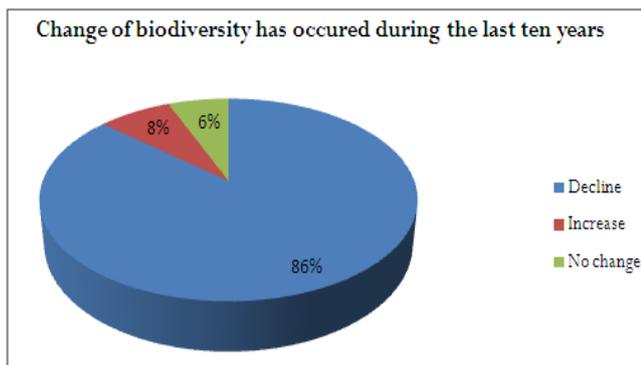


Figure 2. Change of Biodiversity has occurred during the last 10 years

4.2. Fishes of Kobadak River

According to the field data the status of vulnerability of fishes are grouped in the following table and categorized according to IUCN Red List

From the above table it is seen that about 29% of all fishes of Kobadak River is critically endangered, 4% are endangered, vulnerable 25%, least Concern 17%, Data Deficient 17%. This data also shows that Bhol, Snake eel, Kalibaas needs special concern.

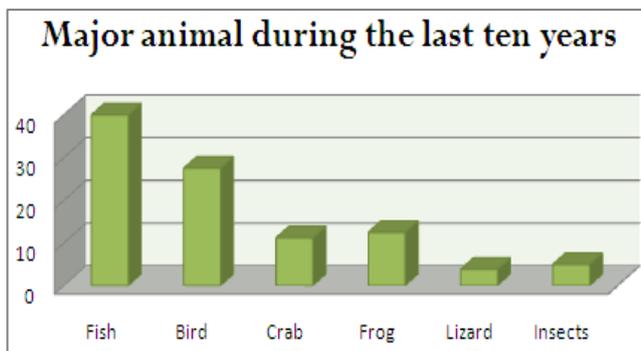


Figure 3. Major Animals during the last 10 years

4.3. Major Animals during the last 10 years

From the mentioned diagram it is noticed that about 40 percent responded said that they are showing a lot of fishes in the river, 27.5 percent comments birds, 11.2 percent said that crab, 12.5 percent showing frogs, 3.8 percent comments they are showed lizard and 5 percent showed different insects in the river basin.

Bird

Kingfisher: In Bangladesh there are 12 species, two of which are threatened: one is endangered and the other one is vulnerable; three could not be evaluated due to paucity of data; seven do not have any immediate threats. Kingfishers inhabit a wide variety of aquatic and wooded habitats. There are a lot of common kingfishers and Collared Kingfisher around the river. They built nests in natural hollows in trees or in burrows excavated by the birds in earth-banks, termite mounds, or rotten-tree stumps by the side of river. Kingfishers perch on dead branches, watching for small fishes, frogs and large aquatic insects. They dive headlong into the water to capture prey, often submerging completely, the preys are struck against the perch several times, tossed into the air and swallowed headfirst.

Other Birds

Over hunting is the main cause of the decline of birds in the river. According to the field data Herron, Pankouri, Kadakhocha, Samukvanga are endangered bird. In fact, there number has decreased in such way that their appearance may be seen like a dream and local people repeatedly try to hunt them. For this, they made trap and use net sometimes to hunt Gang Shalik. Before 10 years, they were abundantly found in the river and surrounding area.

Crabs

In Kobadak River natural populations of mud crab are declining due to the following reason, Over-exploitation, Loss of natural habitat, and Riverine environmental degradation.

Crab fishers use 'Dingi' as their fishing boat and lines (single and multi-baited) and hooks as principal gears. They also use different types of nets and traps. The crabs harvested are done generally to meet the demand of Hindu community. In this way, their number has been reducing. But it is a matter of hope that being living in cave in the river side it is somewhat hard to catch them. So, they can easily adapt to the change, according to the respondents.

Frogs

Frogs are cold-blooded vertebrates of the order Anura, class Amphibia. There are about six types of Frogs in Kobadak River, among them bullfrog is mostly found. They are found abundantly in rainy season. There are some tiny frog species in the river. Bullfrogs are hunted for meat by some people who are responsible for the diminishing number of them. But they are not threatened for extinct.

Lizards

Monitor Lizard (GUI Sap) is a large dry-bodied tetrapod reptile of family Varanidae. Body covered with tubercles, well-developed sharp clawed pentadactylus limbs, neck long, more flexible than in most other lizards, tail not fragile, backwardly curved pleurodont teeth, tongue smooth, long, slender and bifid at the tip and protractile. Feeds on live animals, and carcass. Gui Sap was abundant by the riverside. But, now a day they have become very rare to be

found.

Insects

Kobadak River is very rich in insect fauna having representatives of almost all the orders. The climatic conditions, mild winter, and bright sunshine are all favorable for insect growth and development. There are many insects in the river. But the use of pesticides and herbicides used in agriculture in the surrounding farming land sometimes reduces their number. But, it is a matter of hope that in the rainy season they are seen abundantly all over the river.

5. Major Causes of such Biodiversity Loss in Kobadak River Basin

Local people claim that Over-exploitation is the main cause of biodiversity loss in Kobadak River. 32.5 people said that the main causes of biodiversity loss is over exploitation, 22.5 percent comments causes of biodiversity loss for habitat destruction, 8.8 percent said that change in water tables; changes in water cycle; climate changes and change in land use, 5 percent said that pollution is the causes of biodiversity loss, 2.5 percent people comments unsustainable agriculture practice and 2.5 percent indicates others factor for biodiversity loss.

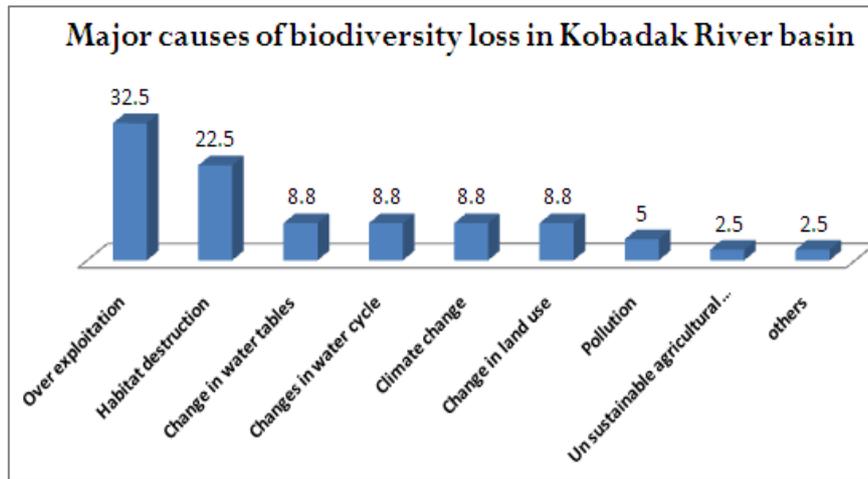


Figure 4. Major causes of such biodiversity loss in Kobadak River basin



Figure 5. Silt Deposition on riverbed



Figure 6. Fishing in the river



Figure 7. Unsustainable Agricultural Practices

5.1. Causes of Indirect Threats of Biodiversity Loss

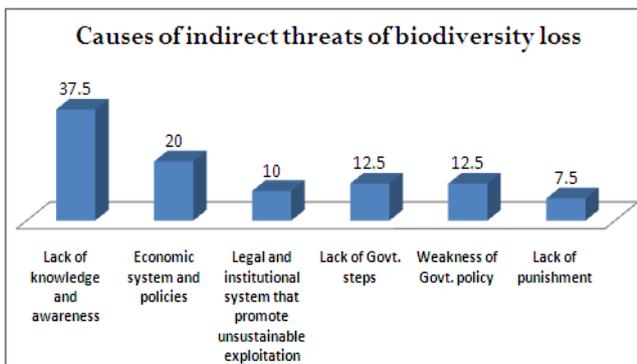


Figure 8. Causes of Indirect threats of Biodiversity loss

Local people claim that lack of knowledge and awareness (37.5) is the main cause of indirect threats of biodiversity loss in Kobadak River. 20 people said that the indirect causes

of biodiversity loss is Economic Systems and Policies, 10 percent comments causes of biodiversity loss for Legal and Institutional Systems that Promote Unsustainable Exploitation, 12.5 percent said that Lack of government steps; Weakness of gov. policy and 7.5 percent said that lack of punishment is the causes of biodiversity loss.

6. Steps the Govt. or Local Administration Taken to Improve Biodiversity

From the mentioned diagram it is noticed that about 69 percent responded said that to improve biodiversity condition for needed river digging, 15 percent comments awakening people for biodiversity condition, 11 percent said that different activities running on kobadak river based work.

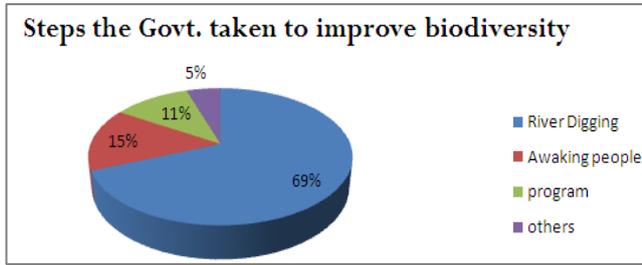


Figure 9. Steps the Govt. or local administration taken to improve biodiversity

6.1. Ganges-kobadak Irrigation Project (g-k Project)

The river was about to die, but the Bangladesh Water Development Board maintains a flow from the Ganges by pumping, providing irrigation to its buffer area in the Ganges-Kobadak Irrigation Project (G-K Project).

6.2. Excavate/Digging

Water Development Board (paubo) - According to reports, Kobadak River 198 kilometers in length. Khulna, Jessore and Satkhira, Jibannagar, Chuadanga River in the district Paikgachha, Sibbari extent. Jessore and Satkhira since part of the Poly 2000 began to fill. Water Development Board to restore navigability of the river in 2011 parts of Satkhira has undertaken a project to excavate. River to drill 2011 is undiscovered for four-year term in July. Under the project, 21.250 kilometers during 2013-14

7. Steps the NGOs Taken for Biodiversity Loss

From the mentioned diagram it is noticed that about 55 percent responded said that to improve biodiversity condition already many Non-government organizations are taken fish culture program for needed improving biodiversity condition. 35.5 percent comments re-excavated for biodiversity condition, 3.8 percent said that different activities running on Kobadak River based work.

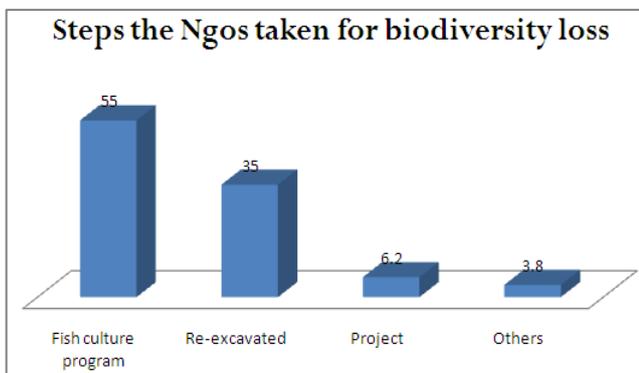


Figure 10. Steps the NGOs taken for biodiversity loss

7.1. Fish Culture Program

BRAC has already initiated a fish culture programme through fishermen group formation in the Kobadak River. The river is partitioned by using split bamboo patta and large sized fingerlings are released in January and are harvested in April-May. There is low level of navigation by boats in the river.

7.2. Baor Development Project

DOF under its Baor Development project has selected five sections of the river which cover about 24 miles for fish culture. Already one section of the river has been re-excavated and culture is being practiced by sectioning it through net partitions. The whole river has a potential for pen culture once it is developed by re-excavation and cleared off the water hyacinth.

7.3. Awareness Raising Program

Awareness raising program is must for the conservation of biodiversity in the river. Most of the people are not aware about the environmental impact of biodiversity loss. Some local educated people claim that lack of awareness and education is the main cause behind this and it seems that government are totally indifferent about the loss and NGOs are also not willing to raise public awareness to protect the river from being damaged. So, it is inevitable to arrange such a program.

8. Others Actions/Steps for Protect Biodiversity

8.1. Pollution Control

To protect biodiversity from being totally damaged the reduction of pollution and contamination of the river is must. Reduction and better targeting of pesticides allows more species to survive in the river.

8.2. Biodiversity Action Plan

Implementation of Biodiversity Action Plan may be a solution to prevent biodiversity loss in the river. Biodiversity Action Plan (BAP) is internationally recognized program addressing threatened species and habitats and is designed to protect and restore biological systems. The original impetus for these plans derives from the 1992 Convention on Biological Diversity (CBD). As of 2009, 191 countries have ratified the CBD, but only a fraction of these have developed substantive BAP documents. The principal elements of a BAP typically include:

- (a) Preparing inventories of biological information for selected species or habitats;
- (b) Assessing the conservation status of species within specified ecosystems;
- (c) Creation of targets for conservation and restoration; and

(d) Establishing budgets, timelines and institutional partnerships for implementing the BAP.

8.3. National Level Laws and Policies

Biodiversity is taken into account in some political and judicial decisions. The relationship between law and ecosystems is very ancient and has consequences for biodiversity. It is related to private and public property rights. It can define protection for threatened ecosystems, but also some rights and duties (for example, fishing and hunting rights). Law regarding species is more recent. It defines species that must be protected because they may be threatened by extinction. Governments struggle to decide whether to focus on for example, genes, genomes, or organisms and species.

8.4. Sustainable Use of Biodiversity

Sustainable Use of Biodiversity refers to the uses of the biological products and ecological services of ecosystems in a manner and at a rate that does not reduce the system's ability to provide those products and services to future generations. Over exploitation has become a major concern for biodiversity loss in the river. Sustainable use of biodiversity is must for the reduction of biodiversity loss in Kobadak River. Sustainable use of biodiversity can be a positive force for conservation because it can provide positive incentives to maintain wild species and habitats. Sustainable use, like any other approach to biodiversity conservation, requires a supportive enabling environment. At the local and national scales, this means good governance, secure land etc.

9. Findings

1. One of the causes is siltation in the riverbed which leads to decrease in the depth of river.
2. Riverbed siltation seems to be high in the recent years.
3. Over exploitation through indiscriminate fishing, hunting of local species led the condition worst.
4. Lack of proper implementation of law is always a hindrance to the flourish of species
5. Most of the species don't have the capacity to adapt to the changed condition.

10. Recommendations

- Public awareness must be increased among people about the biodiversity loss.
- Illiteracy eradication and health care facilities to be enhanced.
- Environment ministry can play a vital role as well as the local government authority, local research institutions, NGOs.

- Government policies must be in favor of biodiversity protection. For this implementation of existing policies and if needed new policies could be introduced.
- Ban on fishing in breeding season can be an effective way to prevent fish species in a great extent
- Pollution and contamination from waste, pesticides and also herbicides must be controlled.
- Indiscriminate and unwise use of biodiversity must be reduced.
- Conservation of bio-diversity and sustainable use of the river ecosystem may be a great way.
- Effective protection of wildlife, especially of the endangered species must be ensured.
- More in-depth applied research and training is needed especially on some potential issues as well as on hydrology, water quality and supply, soil fertility, vegetation, wildlife, precipitation and temperature, climate change fisheries.
- Dredging the riverbed may be a probable and suitable solution.

11. Conclusions

Rivers play a vital role for sustaining life form and help humankind in various ways. Kobadak is a small river but it is too important for the people of Maheshpur. Many of people are totally dependent on this river and to the flourish of agriculture the contribution of this river cannot be neglected. But it is a matter of great sorrow that the biological diversity condition is not same as before 10 years. Indiscriminate hunting of the species is the main cause. On the other hand local authority and government are seemed to be ignorant to protect the river. For this, almost all the species of this river are in threat. But it is also a matter of hope that some species like crab and shelf has adapted to this adverse condition and their number has not reduced in proportion to other species like Boal and Gozar (Local name) fish. To conserve and prevent species of the river being extinct people of all classes should come forward. Government and Local NGO's can play a vital role in this regard.

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