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Environmental Impacts In The Construction Of Dams

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Abstract:

This paper with the title “environmental impacts in the construction of dams” clearly describes the massive effects faced by the environment while constructing mega-structures such as dams. As it comes under huge structures therefore it may sometimes affect the ecological balance of the nature in many ways. So this paper clearly describes about the impacts being governed in the construction of dams as well as the measures that should be taken into consideration while the constructing such huge structures so that the effects on humans, nature, could be minimized. The environmental impacts of dams can also be classified according to different criteria as long term and short term impacts, the impacts on the close area and the impacts on the regions where the dam services, social and unsocial impacts, beneficial and harmful impacts. These effects may be either climatic, hydraulic, biologic, social, cultural, archaeological etc.

Key words: *Impacts, ecological balance, construction, measures*

1.Introduction

This paper clearly describes about the steps that should be taken into consideration while constructing a dam so that it does not have an impact on the environment as well as does not disturb the ecological balance of the nature as that may cause a great threat to the human beings as well as other living beings residing. So the paper clearly depicts different measures so that the impacts could be minimized

2.Effects Of Dams

2.1.Effect Of Dam In Atmospheric System

Changes in moisture percentage, temperature and air movements caused by the water bodies differentiate the climatic conditions related to topography. Regional scaled climatic changes can be observed by these effects. These alterations don't affect human health directly, but they are notable from many plants and animals. Their secondary effects influence human being.

2.2.Effect Of Dam In Earth's Crust

The dams and reservoirs have some seismic effects, it must be stated that this is not proven scientifically. Till now scientist is researching on this topic.

2.3.Effect Of Dam In Aquatic Ecosystem

The decomposing organisms cause an increase in the nutrient substances in water in a short period of time. Therefore, BOD (Biological Oxygen Demand) value of water rises. An anaerobic decomposition method is performed with the help of the stationary layers along the reservoir depth and this result in a dark colour, smelling badly. Besides the phytoplankton and macroflora grow up on the water surface. These events can be harmful both for the lives of the lake, and also for the people fishing, taking a boat-trip and even from the dam gates and turbine propellers. Sometimes, macroflora created here acts like a source for disease vectors. A dam that

will be built on this way will interrupt the life cycle of these creatures and cause deaths in a mass. It has seen that by-pass flows are designed for this purpose.

2.4. Effect Of Dam In Human Life

In spite of the fact that the dams are an important target for development, they are not easily acceptable to people whose agricultural areas, houses and the environment they are living goes under the water. There are changes in the employment and production systems starting before the construction of the dam including expropriation of the land, employment of construction workers and the transport of construction material with the machines to the site. Unqualified workers are employed from the site, however the technicians and experts come from other places. Moreover, the social life becomes active, trade increases, cultural activities arise. Important alterations are observed in the transportation system. The ways lying under water and their surrounding area are important from this point of view. The new roads that were constructed to prevent any breakdown in the transportation services result in additional expenses and additional environmental costs. At the same time dams decrease the pollution effect considerably in the down-stream part by lowering the pollution load coming from the source, thanks to their big storing reservoirs. In addition, they decrease the pollution load again by containing water continuously in their beds during dry periods. It is difficult to consider the relations between these effects beforehand and determine which positive and negative effects will come up. This estimation should be made separately for each dam and reservoir. On the other hand, it is false to comprehend the effects totally negatively. The important point is who will do the assessment and from whose point of view. Will they be based on the fisherman, based on the industrialist or the farmer whose field will be under water? No matter who has taken the decision or whom the decision will take into the centre, as long as whole environmental effects are explained totally according to their importance level.

2.5. Effect Of Dam Territorial Biological System

Biological life of the river changes fast both in the reservoir and in downstream. The parts of the bio-system that are affected by the dam are the watered parts of the shore. During the filling works of the dam, while the lands remain under water the land part of the region decreases. However, the water-land boundary extends. Thus plant, animal or human being livelihood changes. Forests, agricultural areas may come under water. Water-soil-nutrient relations, which were settled after floods in the downstream of the dam, change in a long period of time. Moreover, changes occur in flora, fauna and the agricultural traditions of people in the region. This effect can extend for kilometers.

2.6. Negative Impact Of Dam On The Environment

- Archeological and historical places in company with geological and topographical places that are rare with their exceptional beauties disappear after lying under the reservoir.
- Discharge of toxic materials (pesticides, toxic metals etc.) and their condensation in the food chain may affect sensitive animals immediately, all living organisms
- Water-soil-nutrient relations, which come into existence, are related to the floods occurring from time to time in a long period of time. Depending on this fact, compulsory changes come into existence in the agricultural habits of the people living in this region and also in the flora and fauna.
- Dams may cause increases in water sourced illnesses like typhus, typhoid fever, malaria and cholera.
- Dams affect the social, cultural and economical structure of the region considerably. Especially forcing people, to migrate and affect their psychology negatively.
- Rise in evaporation loses may be expected as a result of the increase in the water surface area.

2.7. Positive Impact Of Dam On The Environment

- Dams are not only important in economic growth, but also in overall economical and moral development. In many developed countries, dams have performed a key role in the development of the underdeveloped regions.
- Dams, which contribute to the national economy from many aspects like irrigation, drinking water supply, flood control, electricity generation, fishing, tourism, are also effective in increasing the standards of living
- It decreases and minimizes the flood effects.
- Land improvement benefits are the extra-benefits that will occur after an increase in the soil productivity because of drainage and land improvement.
- Transportation benefits are the benefits that will happen in case of waterway transportation in the project.
- Providing drinking water and domestic water benefits are different from each other and should be investigated one by one.
- Irrigation benefits define the distinction benefits between dry and irrigated positions.

2.8.Measure To Be Taken

- Review of the activities in the selected projects
- Review Policy and Institutional Framework
- Environmental and Social Assessment of the selected projects
- Public Consultation
- Scoping and screening impacts
- Development of an Environmental and Social Management framework.

2.9.Some Of The Social Impacts That Should Be Taken Into Considerations Are

- Reservoir distribution
- Tourism Development
- Approach of road, dam crest roads, etc. construction / improvement
- Hydropower Generation
- Standby Generator
- River Degradation
- Flood Protection Network
- Wind Mill & Solar Power
- Treatment of leakage through masonry and concrete dams and reduction of seepage through earth dams and their foundations.
- Improving Dam Drainage
- 11 Structural strengthening of dams to withstand higher earthquake loads
- Remodeling earth dams to safe, stable cross sections
- Improving toe drain and seepage measuring devices
- Improving ability to withstand higher floods including additional flood handling facilities, if needed.
- Repairs to damaged spillways, stilling basins and downstream channels
- Improving dam safety instrumentation
- Improving communications
- Flood marking
- Low voltage electrical supplies in inspection and drainage galleries,
- Improving lighting in external areas of dams
- Inspection launching provision
- Rehabilitation / Improvement of Spillway, head regulator and draw-off gates and their operating mechanisms
- Repair / Modification of Spillway Gates
- Cleaning of foundation drain & porous drain
- Repair and cleaning of irrigation outlets

3.Conclusion

With the high demand of hydroelectric power projects it has become a highly essential for the fast construction of dams which on the other hand has a great negative impact to the environment. As the positive side in the construction of dams cannot be neglected therefore the construction must involve the introduction of latest techniques which would further minimize the environmental and social impacts that are hiding behind the construction of dams which should focus on the sustainability of the environment and the nature.

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