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MAJOR PROBLEMS INVOLVED IN MULTIPURPOSE DAM PROJECTS: ANALYSES OF UPPER KOLAB PROJECT OF ODISHA.

Balamakunda Bhuyan[1]

Research Schoolar Dept. of Political Science

Ravenshaw University, Odisha India.

Abstract:

Construction of Large Dam Projects have many negative and positive impacts where, positive impacts are supply of water though canals, hydro electricity generation, flood control of rivers, pisciculture, navigation and recreation and some major negative impacts are the displacement, valuable land loss, forest loss, environment degradation and biodiversity depletion. Big River Valley Projects have effect towards climatic change, damage natural eco- system, high soil erosion and creates air and water pollution. Mega Projects facing big challenges in the ground of massive involuntarily displacement which causes movements and unrest by various Social Organizations, environmentalists, Non-Government Organizations (NGOs), affected Indigenous People and Human Right Activists. The role of environment is not appreciated properly by the public decision-making process. No more river valley projects are considered as symbolic dogma and temple of growth of the nation. This research paper is an enquiry to investigate major problems involved in Upper Kolab Multipurpose Dam Project. Only from the stock-taking of the project and secondary data collected from various institutions is processed and analyzed to deduce the inferences.

Key words: Biodiversity Depletion, Dam Impoundment Area, Decision Making Process, Environmental Degradation, Environmental Economics, Massive involuntary Displacement, Mult-Purpose River Basin Projects, World Commission on Dams.

1.INTRODUCTION

The International Commission on Large Dams (ICOLD) defined, Dams with a height exceeding 15 meters that regulate, store and divert water from rivers are known as the Large Dam Project. The importance of a Large Dam Project is to achieve economic development and considered as a dogmatic symbol of a nation. Multipurpose Dam Projects facing big challenges in the ground of massive forced displacement which causes movements and unrest by various organizations, environmentalists, Non-Government Organizations (NGOs), affected indigenous people and human right activists. It is found that big dams have many folds characteristic and related positive impact in terms of water supply to the cultivable land through canals, hydro-electricity generation, flood control, fishery, navigation and recreation etc., whereas the negative characteristics are big damages of human settlement, wild life, wilderness areas. The major socio-economic loss of the projects is forced displacement with wrong rehabilitation process, valuable land loss, forest loss, environment degradation and biodiversity depletion. Big river valley projects have an effect towards climatic change, damage natural eco-system, high soil erosion and creates air and water pollution. Scientific and recreational 1values are damaged in the process of implementation of River Valley Projects (Bhatt 1987). The reservoir submerged and flooded out peoples' resources, ancestral houses, devasted free flowing rivers, water falls, canyons and rare plant species. (Dasgupta A.K. and D.W. Pearce, 1972,Little and Mirrules,1994). The authority of the project forced the submerged people to resettle in poor environment areas which disrupted their socio-religious activities (Dasmann et. al, 1973). Cost Benefit Analyses is a practical way to calculate, enumerated and evaluated a project. In Cost Benefit Analyses zero weightage is putting to environmental damage caused by the project. The most losers of dam projects are the tribals who forcefully evicted from their own lands and natural habitats may create long serious problems. The gap between De-jure and De-facto displacement is much wider.

2.OBJECTIVES

The main research work of the article is to make an ex-post facto analyses of the project. The main component of the study is to draw the following objectives:

1. To find out the major negative and positive impacts involved in a Multipurpose Dam Project particularly the Upper Kolab Dam Project,

2.To analyses problems and discourses caused by Multi-Purpose Dam Project,

3. To know about the project and appreciate the dynamic role of the project in regional level.

3.Methodology

The present study based on to know the impacts involved in upper Kolab Multipurpose Dam project. The research is complete based on the secondary data which have been collected from various sources like different books, journals, paper cuttings, project office and project recommended books. Experience and logically facts, figures and evidences are compiled to find out the insight. All the collected data are assimilated and processed.

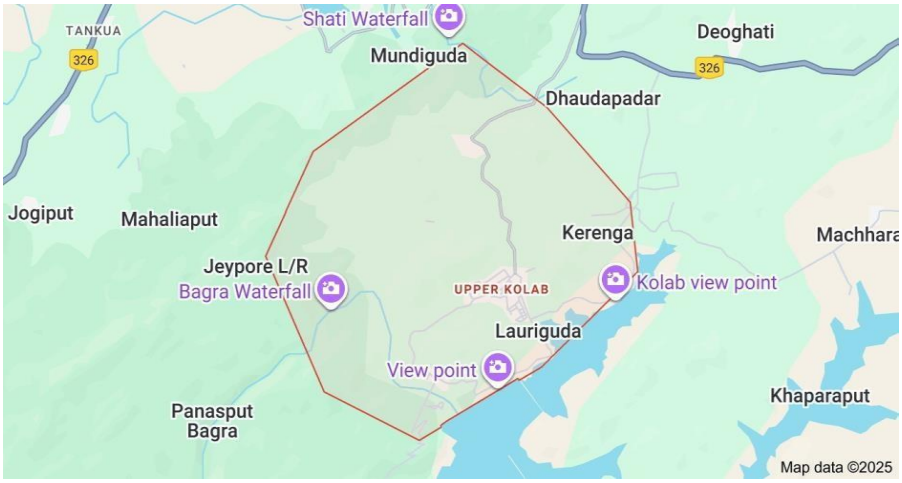
4.THE STUDY REGION AND THE PROJECT.

Koraput is located South-Eastern Ghat mountain range. Some parts of the area occur at 150-1000 meters above the Mean Sea Level (MSL). The region is characterized by scatted, isolated, sharp and some series hills with forest covers. Gullies and ravines are steadily encroaching land of many major command areas. Excessive deforestation, overgrazing, faulty agricultural practice and the industrialization is the causes of erosion. Factors like climate (temperature, rainfall and wind), vegetation, topography (degree and length of slope) and soil type (infiltration, permeability, soil depth, particle size) ultimately refers to its erosivity. The process of conservation practices includes biological measures, mechanical measures, technical measurer, contour farming, contour bonding, graded bonding, beach terracing on steep slopes, runoff harvesting, storage and recycling. The soil conservation programmes and rural development programmes benefited to the rural people. Most of the marginalized sections of the society are highly benefited through the application of soil conservation programmes. It is proved that soil conservation programmes are benefited to the local marginal tribals as well as to non-tribal people in Korapput district. Interventions through various governmental programmes increase quality of life such as prevention of health measures, sanitation, drinking water, food security and so on. Soil conservation programmes also enhance income of the poor, marginal and landless households through promotion of self-help groups and common interest groups.

Micro credit and savings, micro enterprise promotion, skill development, primary processing and marketing, livestock promotion, fishery promotion and other farm enterprise development is also visualized.

Kolab river a tributary of Godabari is located in Koraput district of Odisha has a Multipurpose Dam Project nearer to Jeypore town of Koraput. At the initial stage of Upper Kolab Project, it was investigated by the then Government of Madras before April 1936. At that time Koraput district was a part of Madras Presidency and subsequently detailed investigations were carried out by Govt. of Odisha after 1961. The power project was approved by the Planning Commission during August 1975 and irrigation project in June 1976. The project has its reservoir including a dam, a power station canal at sides of outlet of water for agricultural purpose after generation of electricity (Map-1). Some proposal was finalised for the development of dam sites and water conductor systems of the project.

Map- 1: Upper Kolab Dam project



(Source-From internet)

The Kolab dam is an earth dam with concrete both the sides and has a straight masonry gravity dam with 54.5 meters high and 630.5 meters long. The reservoir has a Gross Storage Capacity {GSC) of 1215 MCM with 935 MCM of live storage. The Full Reservoir Level (FRL) is 858 meters and the Minimum Drawdown Level (MODL) of the dam is 844 meters. A GIS study indicates a high rate of annual sedimentation in reservoir area affecting the potentiality

and longevity of the dam. The location of the project is 5km distance from Jeypore town of Koraput district of Odisha,

FIG-1 DAM WITH 11 SPILLWAYS

(Source- From internet)

The project includes a Power Station having an installation capacity of 320MW of 4 units of 80 MW each.

Fig-2: Shows the power station

(Source- From the internet)

Coordinates: $18^0 49' 54''$ N $82^0 35' 37''$ S Operators (s): OHPC Commissioning

Date : 1993 Turbines : 320 (80) each Francis turbine type

Installed Capacity of the project is 320 MM (Fig-2). After generation of electricity, it irrigates 47985 hectors of cultivable land and provides drinking water facilities to nearby town such as, Damanjodi, Sunabeda, Jeypore and Koraput.The projects main canal is Jeypore main canal which is designed to carry waqter to Jeypore , Boriguma and Kotpad Tehsil with an additional 22,267 hector in high contour up to the Telengiri River. The project also diverts water supply to jeypore town from Satiguda Dam Pond created by the Project The feature of Power Station has four Vertical Francis Turbine manufactured by BHE **(Fig-3).**

FIG-3 : SHOWS THE OUT LET TUNNEL WITH WATER FOR IRRIGATION

(Source- From the internet)

5.PROBLEMS FOUND IN THE PROJECT IMPOUNDMENT AREA

The problems basically observed in the large dam projects are four categories, like, social and human problems, production problems and environmental and resource problems. Generally, some positive and negative impacts are gathered from various studies which is given in table-1.

TABLE -1 PROBLEMS OBSERVED IN PROJECT IMPOUNDMENT IN AREAS

SI.NO.	Types of Problems	Particulars of Problems
1	Social and Human Problems	i. Competition among Resettlement people with previously established population usually sifting cultivation. ii. Problem due to extended and broken of families. iii. Dietary problem for new crops and malnutrition. iv. Resettlement demand on multiple socio-economic and cultural establishment v. General disruption of human ecology and man and land relationship.
2	Production Problems	i. Settlers unfamiliar with production techniques for new crops in different climate and soil ii. Unsuitable to practice agriculture of flood plain areas in upland.
3	Environmental and resource problems	i. Resettlement in upland is less productive and difficult to practice them in less fertility and soil eroded land ii. Productive forest land will convert to less productive agriculture land at settlement site. iii. Resettlement in steep catchment leads to deforestation. iv. People will suffer new diseases in newly established areas
4	Management and administrative problem	i. Inadequate pre-settlement surveys. ii. Studies made but no follow up action is taken. iii. No adequate information and orientation among the affected people. iv. Inadequate compensation to evacuated people

		but not settled.

(Source:Dasmnn et.al.,1973)

6.Major Problems Involved in Large Dam Projects

The problems found in major dam projects are prioritized and briefly discussed in such a way that also reflected in Upper Kolab Dam Project.

I.Problems in Sustainable Development

Development generally indicates the qualitative change or progress in material wellbeing. Sustainable development is an approach which balances the need of present generation without hampering the future generation. Basically, it involves the economic growth, social progress, environmental protection and ensuring healthy planet. Sustainable development connected each other of the above in long term progress. This also mitigating climate change, protecting biodiversity and Development is pointed out with education organization and discipline with growth, performance and production more (Sahoo,2005).

II.Biodiversity Depletion /Extinction of Rare Species

The major cause of the multi-purpose dam project is to submerge a vast forest and mountainous area by its construction of big dam which lead to biodiversity depletion. Biodiversity depletion refers to the reduction or disappearance of plant and animal species otherwise known as decline in genetic diversity and ecosystem verities. Depletion of animal and plant species from local extinction to global species extinction. Human activities are the prime cause of current biodiversity and threatening essential ecosystem. Habitat loss and degradation due to different human activities will arise pollution, climate change and invasive species. The consequence of biodiversity depletion drive towards ecosystem instability, increased vulnerability to disasters, health impacts, economic losses, ethical and cultural impacts etc.

III.Rehabilitation and Resettlement Problems

Displacement force to the communities out from their ancestral home and converting them to stranger in their home land (Mishra,2019). Establishment of Projects in Public and Private mechanism, displaced people permanently from their own settlements. Rehabilitation and Resettlement is a major work of Dam Projects constructed in different areas. The important work of it to provide support and compensation to individuals and communities displaced by the construction of dam project. It ensures their well-being and sustainable

development. The main objective of R & R of dam projects are land based resettlement, financial compensation, community development like schools, health care facilities, water supply etc. with regular monitoring. Rehabilitation and compensation are pathetic for both the authorities and outies.

IV.Problems in soil conservation

Soil and water are two important component and endowment of nature to operate the living world. It is the gift of nature which make sustainability of whole biological kingdom. It is proved and evident that soil loss and degradation particularly in multipurpose reservoir areas silted up in an alarming rate. Riverine, gullies and mountain slops steadily encroaching the productive command areas which endangered the flora and fauna. The process of shifting cultivation practices and deforestation in tribal mountainous areas are the main causes of soil erosion. In 6th Five Year Plan (1980-85) National Land Resources Conservation and Development Commission on National and State Land Use Board were set up. Integrated Watershed Management in the catchment of flood prone river launched. Soil conservation in the catchment of river valley projects was started in this five-year plan. The top soil is the life supporting layer and has an indestructible power for our survival (Tejwani et.al 1975).

V. Distress Migration

Migration is a common feature seen in most of the backward region of Odisha. Increase in population, mass poverty, immigration, displacement through major development projects, deforestation and pressure on land are the main cause of migration. Tribal migration is a common phenomenon due to involuntary displacement due to the acceleration of multipurpose river valley projects. This compels them to search new works in different working place. Due to lack of education, tribal people are mainly involved in construction, digging soil. physical labour and farming work etc.. The present study not discusses about the incident and impact of migration but only to cover the real facts arising due to involuntary displacement.

VI. **Problems in Air and Water Pollution**

The implementations of river basin projects need vast area for construction for its dam, power project, canals, official quarters, markets, rehabilitation and resettlement colonies with schools, hospitals, roads and to provide many more basic amenities. Use of polythene, garbage and many other materials may lead to air and water pollution. The flooding of different materials to the reservoir may lead the decomposition of organic maters and produces poisonous gases which cause various diseases to both aquatic and human beings.

7.Discourses of Large Dam Project

Different groups opposed the benefit of large dam projects which is not equally distributed among the privileged and vulnerable sections. From the peak period of construction of large dam projects, it is considered as temple of progress but after 1970 the projects are opposed and construction of Mega Dam Projects are discussed as the crime. Discourses and disaffection begun to oppose environmentally, socially, economically and politically (Table-

.2). Below depicts some major discourses over the decades but not possible to indicate completely year wise due to watertight. The present discourses are found basically four dominant issues like, regions to build large dam projects, its ideology, actor and development. Earlier campaigns were basically concerned with protection of cultivable land, tropical forest and conservation of biodiversity. But in current age, protests are organized by looking large scale involuntarily displacement.

Table -2: Changes in Discourses of large Dam Projects (Phase-1)

Si,No.	Dominant Issues	1940 to1950	1960 to 1970	1980 to 1990	2000 onwards
1	2	3	4	5	6
1	Reason to build Large Dams	Multipurposed mainly for Irrigation and flood control	Improving irrigation mechanization with the advancement of green revolution	Harnessing hy-droelectrcity	Multipurpose and political gain
2	Ideology	1.Nationalism based on nationalistic ideas. 2.Regionalism was not encouraged	Nationalism	!. Market Oriented 2.Convergence of Local and regional gain 3.Nationalistic ideals.	!. Market Oriented 2.Convergence of Local and regional gain 3.Nationalistic ideals.
3	Actors	1.Project affected 2. Central and state Govert interferences	1.Project affected 2. Central and state Govert interferences	1.Project affected 2. Central and state Govert interferences	1.Project affected 2. Central and state Govert interferences

			3. World bank is the Donor (Social Movement localized)	3. World bank is the Donor (Social Movement localized)	3. World bank is the Donor (Social Movement localized) 4.Non Government Organisation (NGO) 5.Civil Society 6.Social Movements	3. World bank is the Donor (Social Movement localized) 4.Non Government Organisation (NGO) 5.Civil Society 6.Social Movements 7.World Commission.

(SOURCE: MISHRA, P.K. AND S. MISHRA, P. 103 2018).

8.Upper Kolab Multipurpose Dam Project; A Stock Taking

Upper Kolab Hydro Electric Project, Located in the district of Koraput (odisha) was taken up for excavation in the year 1976 by the Irrigation and Power Department, Govt .of odisha at an estimated cost of Rs. 74.63 Crores. This Project is utilising the water potential of river 'KOLAB'a tributary of river Godavari. It is a multipurpose project aimed at Generation of Hydro Electric Power, providing irrigation facilities to 47,985 H.A. by lift canal irrigation and suppling drinking water to Damonjodi, Koraput, Sunabeda and Jeypore town.

Upper Kolab Dam project is famous for its nature's beauty attraction and recreation to visitors. Otherwise, it is popularly known as heavens paradise. People of different areas of the district and outside the district come to enjoy the nature. The project not only provides irrigation, hydro-electricity, navigation but also attracts the natures lover for its scenic beauty. The tranquil atmosphere around the reservoir, rolling and undulated mountains, water bodies, canyons and water falls converted the place to a perfect picnic spot.

Estimated cost of the project at different time is shown below (in Lakhs). The work has begun from 1976 and end 1993.The Project work was completed in two stages i.e. STAGE-I & STAGE-II. In stage -I, 3 nos. of 80MW Hydro Generators along with their auxiliaries, 220 KV Switchyard, water conductor system, Reservoir etc. were completed and commissioned; Under Stage-II, only the Installation and commissioning of Unit IV was completed. Major Works of Stage-I were completed during 1993. The total revised expenditure for completion of major electrical works under stage-I and stage-II comes out to be 8880 lakhs (Approx) but the table- shows a sum of different costs in different development works.

Table- 3: Estimated Cost of Dam, Power and Irrigation Project

Si. No.	Development of works(Lakhs)	Original estimate 1976(Lakhs)	Revised estimate Phase-I(Lakhs)	Revised estimate phase-II(Lakhs)
1	2	3	4	
1	Dam Works	1497.89	5790.27	8062.18
2	Power(Civil)	2051.72	3777.65	5322.18
3	Power (Electrical)	2283.00	5729.00	5729.00
4	Irrigation development	1631.32	6774.85	10477.46
5	Grand Total	7643.93	22071.77	30090.76

(Source: Collected from google search)

The main defect of large Dam is its displacement. Like the other large dam projects, a mass displacement also involved in Upper Kolab Project and the most victims are seen particularly, in tribal communities due to its submergence by the reservoir .The table-4 depicts that out of 3067 families 1431 families are tribal families of different communities.

TABLE-4: TOTAL DISPLACEMENT FAMILIES OF DIFFERENT CATEGORY PEOPLE DUE TO THE PROJECT

Sl. No.	Displaced	General	Tribal	% to total
1	Odisha (Irrigation & Dam project)	410000	3067	37.45
2	Upper Kolab Dam Project	3067	1431	46.66

(Source: Femandas, Walter and Mohamad Asif, 1997. Development Induced Displacement and Rehabilitation, Odisha !951- 1958: a Database on its Extent and Nature, New Delhi).

9.Anti Dam Movements and Disputes

Anti-dam project has been intensified in the modern era by Social workers, Environmentalists, NGOs and Tribal Leaders and local people. But here, they protesting since the inception of Upper Kolab Multi-Purpose Dam Project. They protested by visualizing many fold effects like, involuntary tribal and non-tribal displacement, environment issues and forest depletion, Safety and design of dam etc.. The merits and demerits of Large Dam Project are analyzed through social gain and loss. The large-scale cost on construction for induced development led to destruction. The valuations of environment costs are untouched in the engineering decision making process. It ignores the cultural, social, economic and religious life of the tribal people. When a big dam project comes to an existence in the hilly and tribal areas, by the decision-making mechanism, its victims will naturally be a large number of tribals. The great problem while constructing a dam is the submergence caused by the reservoir. Being uneducated and poor, they cannot raise their voice against the authorities.

10.Conclusions

It is seen that Dam projects have different positive and negative dimensions. The positive effects are related to water supply, generation of hydro- electricity, prevention of flood damage, fishery, navigation and recreation etc. The major negative costs are displacement, valuable land loss, forest loss, environmental degradation and biodiversity depletion etc. Big dams usually cause big damages in terms of loss of human settlements, resources, forests, wild life and wilderness area etc. The most important element of nature is the forest which caters the need on the basic of fire wood, food, fodder, medicine, wood for building and raw materials etc. Big river valley projects generally have the effects on climate change and an increase in the fragility of natural eco-system, soil erosion, and air and water pollution. Ecological impacts are associated with the river basin development on aquatic life including fish, aquatic plants and organisms that transmit human diseases. Scientific and recreational values of resources may be lost in the process of river basin development.

Reservoirs devastate unique natural areas, existing potential parks, wild life reserves and important historical and archaeological sites. It also destroys natural features of free-flowing rivers, waterfalls, canyons and rare plant communities permanently. Investment in mega projects environmental protection is normally less prominent. The present study describes about the Upper Kolab Multipurpose Dam Project which submerged a vast forest terrain including tribal settlements. Large scale deforestation and involuntary displacement took place in the developmental project. There exists a close link between biological resources i.e. natural capital, social capital (indigenous knowledge) and human capital which decline the material resources may cause a threatened. Loss of species in the biological sphere would cause a loss of indigenous knowledge.

The Satiguda Pond Reservoir attracts tourists and provides recreation opportunities to the local people and out siders. For recreation, the Dam Authority has been collecting a good amount from the tourists towards entry fees. Travel Cost Method (TMC) is used for tourists towards recreation for coming from the local and

outside areas (P.K. Mishra-2019). From time to time, the Forest Department has also taken up various plantation programmes to conserve the soil and protect the reservoir areas They also provided good labour works to the local people which enhances their standard of living. Infrastructural facilities have been provided to the local people by the district administration. Market expansion also possible in local areas which is a development of regional level. In cost benefit analysis (CBA) of a Multipurpose Dam Project, a number of benefits are counted. The concept and components of Total Economic Value (TEV) includes environmental and ecological-economic value. Both present and future value of benefits are also counted in TEV (Hanley and spash,1993).

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