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Interlinking Of River

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Abstract: The rivers in India are truly speaking not only life-line of masses but also for wild-life. The rivers play a vital role in the lives of the Indian people. The river systems help us in irrigation, potable water, cheap transportation, electricity as well as a source of livelihood for our ever increasing population. Some of the major cities of India are situated at the banks of holy rivers. Proper management of river water is the need of the hour. Indian agriculture largely depends upon Monsoon which is always uncertain in nature. Hence, there is a severe problem of lack of irrigation in one region and water logging in others. Damage to crops due to drought and pitiable drainage facility could be managed. Depleting and decreasing status of water resources may be one of the most critical resource issues of the 21st century. The core objectives of the paper are to study issues and challenges in interlinking of rivers in India and to study environmental impact of Inter-River Linking Project (IRL). At the backdrop of this, the present paper is an attempt to study issues and challenges in interlinking of rivers in India from the point of view of society at large.

Key words: Water, environment, society, masses, management.

I. INTRODUCTION

Water is undoubtedly the most important natural resource on the planet, as it sustains all aspects of life in a way that no other resource can. United Nations agencies and the World Bank have claimed that these scarcities will escalate in the future, creating serious problems for humankind and the environment. India needs to adopt a crystal-clear water mission that can help us to use available water resources to fields, villages, towns and industries round the year, without harming our environment.

Keeping in mind the increasing demand for water, the government of India has developed a new National Water Policy which claims that water is a prime natural resource, a basic need and a precious national asset. India‟s National Water Development Agency (NWDA) has suggested the interlinking of rivers of the country. This proposal is better known as the Inter-River Linking Project (IRL). It is a mega project that engages money, resources, engineering, management and human understanding. It is designed to ease water shortages in western and southern India and aims to link 30 major rivers.

It will also involve diverting the Ganges and the Brahmaputra – two of India‟s biggest rivers. It is estimated to cost US $ 123 billion (as per 2002) and, if completed, would be the single

largest water development project anywhere in the world. It is expected that properly planned water resource development and management could alleviate poverty, improve the quality of life, and reduce regional disparities, better law and order situation and manage the integrity of the natural environment. The core objectives of the paper are to understand the historical background of Interlinking River Projects and to discuss issues and challenges pertaining to Interlinking River Projects.

II. REVIEW OF LITERATURE

The idea of linking rivers is not new. It was Sir Arthur Cotton who had originally proposed the networking of rivers more than a century ago, and Dr. K. L. Rao, the Minister of Power and Irrigation in the Cabinet of Smt. Indira Gandhi, revived this proposal in 1972. Both were no doubt eminent engineers. Cotton‟s prime concern was for inland navigational network and Dr. Rao‟s concern was for irrigation and power. (Shiva and Jalees, 2003) The then-Ministry of Irrigation (now the Ministry of Water Resources) conceived a plan for “Na-tional Perspectives for Water Development” in August 1980 (Ministry of Water Resources, 1980)

This paved the way for the establishment of the National Water Development Agency (NWDA) in 1982 to work out basinwise surpluses and deficits and explore possibilities of storage, links and transfers, has identified 30 river links, which would connect every major river in the Indian mainland, and has prepared a feasibility report on six of these. The Supreme Court has asked the Government of India to complete all planning required to launch the project by 2006 and these projects of inter-basin transfers be completed in the next 10 years or so.

Shah and Raju (1986) studied the nature and pattern of the development of water markets across regions of India considering the lift irrigation potential as a major criterion. Even in the international context, supply sharing has been a matter of big *vs* small, with problems over supply in Nepal, Bangladesh, and India. In issues of inter-basin transfers, such diversions do indeed cause the

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liveliest concerns, often leading to protests and resistance in the exporting region, sparked by the elemental importance of water for life and the economy (Verghese, 1990).

On governance, Ramaswamy Iyer (2002, 2003) writes that the most visible manifestation of water politics has been in inter-State river-water disputes. The dispute over the sharing of Cauvery waters has assumed enormous importance in the politics of Tamil Nadu and Karnataka. Similarly, the disputes over Ravi-Beas waters have occupied Punjab and Haryana. Verghese (2003), one of its few champions outside the government, suggests it should be viewed as a 50-100 year project. Verghese (2003) found ILR variously described as

"frighteningly grandiose", a "misapplied vision", "extravagantly stupid", a case of putting the "cart before the horse", a "sub-continental fiasco", "a flood of nonsense", a "dangerous delusion" or a case of "hydrohubris". According to Iyer (2003) "It amounts to nothing less than the redrawing of the geography of the country."

According to Bandyopadhyaya and Praveen (2003), the proposal claims to package an uncertain and questionable idea as a desirable one. Rath (2003) called the ILR a „pie in the sky" because he, like many others, is skeptical of the government"s capacity to mobilize the kind of investable funds ILR demands. Shukla and Asthana (2005) reveal the challenges inherent in the government"s policy decision to interlink rivers as envisaged by the bureaucratic agency of state power, a culture of scientific expertise, a perceived need to mobilize global capital, and the opposition to such plans engendered by the agency of civil society in a bid to examine how different actors conceptualize the project through a discursive approach. It is expected that the water demand of nonfood grain crops will further accelerate with changing consumption patterns (Amarasinghe *et al*, 2007a; 2007b).

Krueger *et al* (2007) highlight that properly planned water resource development and management has the ability to alleviate poverty, improve the quality of life, and reduce re-gional disparities and to maintain the integrity of the natural

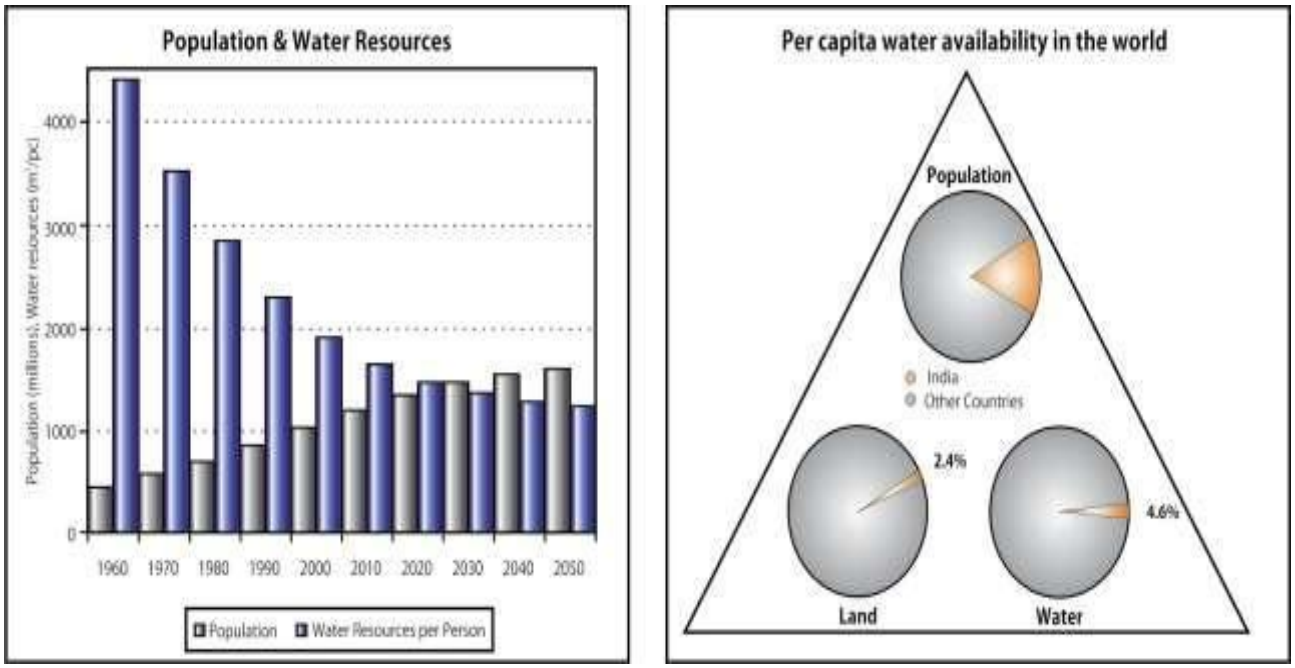


Fig. 1. Source: Home Page of International Water Management Institute (IWMI) http://nrlp.iwmi.org/ (as per 2012. The new homepage of International Water Management Institute is www.iwmi.cgiar.org)139 Geo-Eco-Marina 19/2013

Environment. Shah et al (2007) layout seven reasons why revisiting the river linking issue is a good idea. Reddy (2008), in his most comprehensive review of water pricing as a demand management option, concludes that the ability of water pricing to influence water use in India is severely constrained both by the nature and level of water rates as well as by the lack of effective institutional and technical conditions.

Shilp et al (2008) show that the existing pattern of inter-state virtual water trade is exacerbating scarcities in already water scarce states and that rather than being dictated by water endowments, virtual water flows are influenced by other factors such as „per capita gross cropped area" and „access to secured markets". IWMI-CPWF project (2009) provides the public and policy planners with a balanced analysis of the benefits and costs of different components of the National River Linking Project (NRLP).

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III. RESEARCH METHODOLOGY

Interlinking of Rivers is a dream project and the road ahead is quite challenging. This was a study conducted on the basis of secondary data available from various sources along with literature review. In literature review, research information from 1986 to 2008 was collected and studied. The secondary data was collected from magazines, books, internet, industry journals etc. Literature review has shown prior research work done in this area. Significant inputs were found in the subject matter with reference to interlinking rivers projects. The impact on the environment has been analysed.

IV. INTERLINKING RIVER PROJECT

The interlinking of rivers has two components: the Himalayan component and a Peninsular one. All interlinking schemes are aimed at transferring of water from one river system to another or by lifting across natural basins. The project will build 30 links and some 3000 storages to connect 37 Himalayan and Peninsular rivers to form a gigantic South Asian water grid. The canals, planned to be 50 to 100 meters wide and more than 6 meters deep, would facilitate navigation. The estimates of key project variables - still in the nature of back-of-the-
envelope calculations - suggest it will cost around US $ 123 billion (or Indian Rs 560,000 crores, at 2002 prices), handle 178 km of inter-basin water transfer/per year, build 12,500 km of canals, create 35 giga watt of hydropower capacity, add 35 million hectares to India's irrigated areas, and create an unknown volume of navigation and fishery benefits.
Similarly, 3700 mega watt would be required to lift water across major watershed ridges by up to 116 meters. The

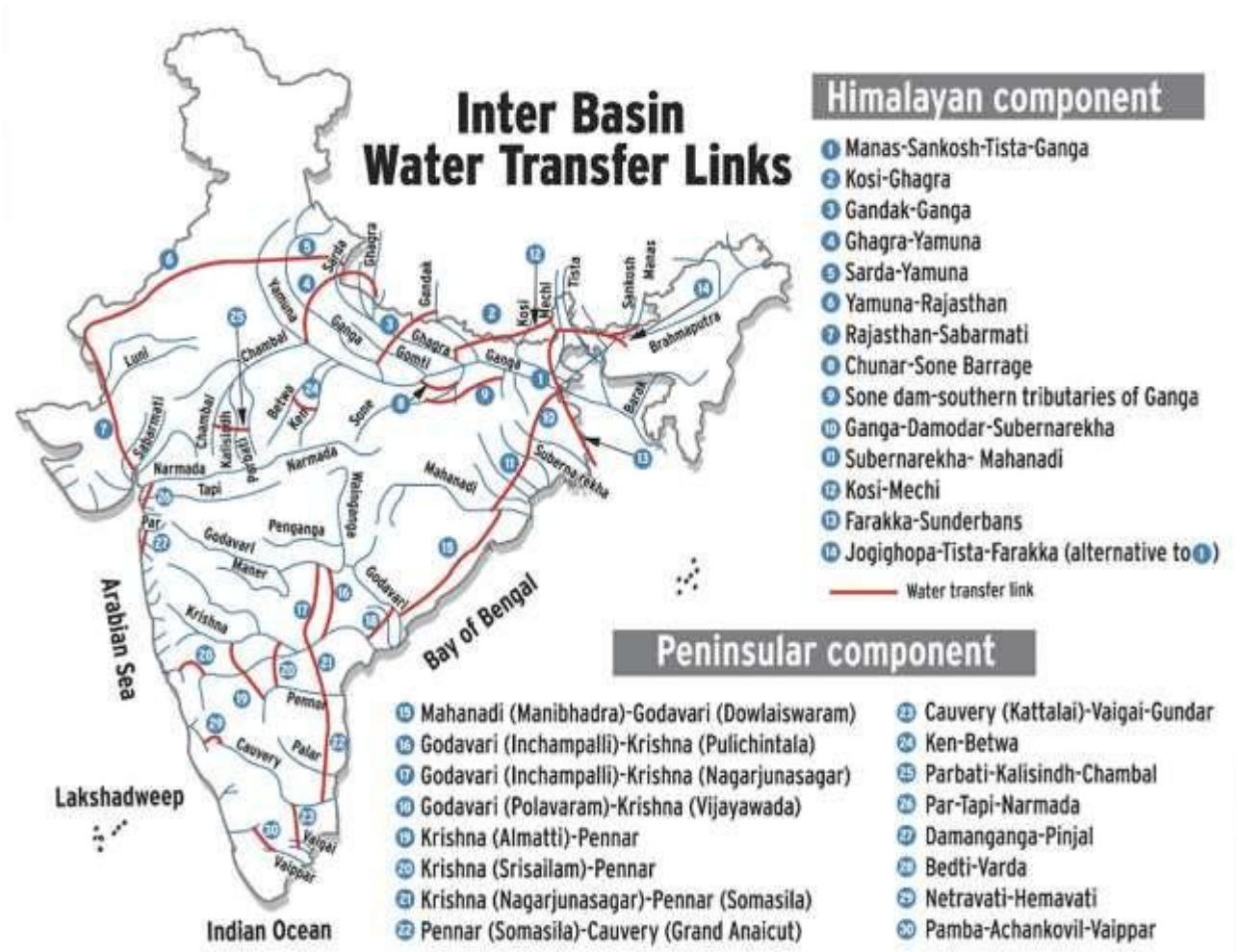


Fig. 2. River Links under the National Perspective Plan. Source: National Water Development

Majority of observers agree that the Project may not be in operation even by 2050.

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A. Major Advantages Of Ilr

1) Create the potential to increase agricultural production by an additional 100 per cent over the next five years;
2) Avoid the losses of the type that occurred in 2002 to the extent of $550 million by the loss of crops because of extreme draught or flood condition;
3) Save $ 565215000 a year in foreign exchange by avoiding importing oil;
4) nify the country by involving every Panchayat as a share holder and implement agency;
5) Provide for enhancing the security of the country by an additional waterline of defense;
6) Provide employment to the 10 lakh people for the next 10 years;
7) Eradicate the flooding problems which recur in the north-east and the north every year;
8) Solve the water crisis situation by providing alternative, perennial water resources;
9) The large canals linking the rivers are also expected to facilitate inland navigation too;
10) Increasing food production from about 200m tones a year to 500m;
11) Boost the annual average income of farmers, from the present $40 per acre of land to over $500.

B. Major Disadvantages Of Ilr

1) Environmental costs (deforestation, soil- erosion, etc.)
2) Rehabilitation: not an easy task
3) Social unrest/Psychological damage due to forced resettlement of local people (for example, Sardar Sarovar Project)
4) Political effects: strained relationship with neighbors (Pakistan, Bangladesh)

C. Issues And Challenges

Inter-River Linking Project involves multifaceted issues and challenges related to economic, ecological, and social costs. On this note, Iyer (2003) very sharply states that “We have had great difficulty in completing even a single project successfully and we want to embark on thirty massive projects at the same time.”

IRL project has caused much anger and protest in our neighbouring nation, Bangladesh. It is grappled with fear that diversion of water from the Brahmaputra and the Ganges, which provide

85% of the country‟s fresh water flow in the dry season, would result into an ecological disaster.

Indian National Water Development Agency plans to dig hundreds of reservoirs and more than 600 canals. This may trigger an alarm among environmentalists to raise their voice against this plan. Environmentalists are quite concerned about the ecological impact of the project of such huge magnitude. Shiva (2003) very aptly remarked that the water flowing into the sea is not waste; it is a crucial link in the water cycle. With the link broken, the ecological balance of land and oceans, freshwater and sea water, also gets disrupted Shiva considered ILR violence to nature: “Violence is not intrinsic to the use of river waters for human needs. It is a particular

characteristic of gigantic river valley projects which work *against*, and not *with*, the logic of the river.”

As this project is of massive estimated cost, a long term planning and a sound financial simulation are required to meet the standard of due diligence for such proposals. The huge expenditure may likely generate fiscal problems that are difficult to handle. The maintenance cost and physical position of the dams, canals, tunnels, and captive electric power generation will also involve huge financial burdens. This certainly requires financial assistance from the private sector, as well as global capital agencies. Mobilization of global capital may ultimately entail the risk of destroying social welfare measures.

The rehabilitation of project-affected people in water infrastructure projects will also pose a burning question before the concerned authorities. The construction of reservoirs and river linking canals in the peninsular component alone expect to displace more than 583,000 people and submerge large areas of forest, agriculture and non-agriculture land.

Transfer of water is bound to be unacceptable as no state is likely to transfer water to another foregoing possible future use of such water. Domestic and regional geo-politics play a pivotal role on the discussions on ILR. As of now, there is no mechanism as of now to deal with matters concerning inter-basin transfers. There are also important institutional and legal issues to be sorted out. As per the latest information disclosed in the Indian Parliament, Union Minster of Parliamentary Affairs and Water Resources informed the house that NWDA has spent Rs 350.5 crores on various Inter-River Linking Project (IRL) studies up to February 2012 and Water Resource Ministry had not received certified copy of guidelines, as issued by the Hon‟ble Supreme Court of India.

Some of the ILR (inter-linking of rivers) schemes have international implications, with a possible impact on countries like Bhutan, Nepal and Bangladesh. Each of the 30 schemes of the ILR is supposed to get through several statutory, legal and procedural steps.

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None of the schemes have gone through any of it. The Union ministry of environment and forests has already said no to the project. No state is ready to give water to another state. In India„s constitution, water is essentially a state subject. Several states including Kerala, Andhra Pradesh, Assam and Sikkim have already opposed ILR projects. There will be several environmental impacts of ILR including sub141 Geo-Eco-Marina 19/2013 Dharmendra Mehta, Naveen K. Mehta– Interlinking of Rivers in India: Issues & Challenges

mergence of land and forests, destruction of rivers, aquatic and terrestrial biodiversity, downstream impacts, destruction of fisheries, salinity ingress, pollution concentration, destruc-tion of groundwater recharge and increased methane emission from reservoirs, among others. Unfortunately there is no comprehensive assessment of all such possible impacts for a single link in any credible way.

V. ENVIRONMENTAL IMPACT

The Ministry of Environment and Forests, Government of India, on 23rd of May 2003, had shown a very serious concern about the environmental issues related to the proposed interlinking project. Bandyopadhyay (2003) asked the question "How are the environmental damages that may be caused by the interlinking project identified and their financial costs estimated, if at all?"

Martin (2003) clearly warned that linking rivers like straight pipelines without looking at the ecological impact may be very harmful for our environment. Scientists are also doubtful that river diversion may bring significant changes in the physical and chemical compositions of the sediment load, river morphology and the shape of the delta formed at the river basin. Water related diseases, such as Malaria, and Filariasis can spread through stagnant or slow moving water in the irrigation command area. The ecologically un-informed economic development activities, like widespread waterlogging and the resulting desertification in the catchment areas of many large irrigation projects, can also be cited.

Roy (1999) states that, "In India, fifty million people are estimated to have been displaced in the last five decades by the construction of dams, power plants, highways and such other infrastructure development projects. Subsequently no more than one-fourth of them could be assisted to regain their livelihoods". Wolfensohn (1995) remarked that „Such social injustice can destroy economic and political advances. With the link broken, the ecological balance of land and oceans, freshwater and sea water, is also disrupted (Shiva 2003).

A section of scientists argue that large dams and reservoirs also cause earthquakes. The controversies over koina dam, Tehri dam are few such examples. In view of a spate of earthquakes being experienced, the presence of large number of reservoirs will prove to be disastrous in case of any such eventuality. Inter-linking a toxic river with a non-toxic one will have a devastating impact on all our rivers and, consequently, on all human beings and wild life.

Shiva (2003) considers ILR to be an act of violence against nature: "Violence is not intrinsic to the use of river waters for human needs. It is a particular characteristic of gigantic river valley projects that work against, and not with, the logic of the river. These projects are based on reductionist assumptions, which relate water use not to nature"s processes but to the processes of revenue and profit generation… Rivers, instead of being seen as sources of life, become sources of cash. In Worster"s words, the river ends up becoming an assembly line, rolling increasingly toward the goal of unlimited production. The irrigated factory drinks the region dry." Iyer (2003) is acerbic in his comments on IRL projects: "Are rivers bundles of pipelines to be cut, turned around, welded and re-joined? This is technological hubris – arrogance – of the worst description, prometheanism of the crassest kind. The country needs to be saved from this madness."

VI. CONCLUDING REMARKS

Successful implementation of this project largely looms upon timely release of water from the surplus basin to the deficit basin. The Government of India has constituted a task force to examine the project, comprised of experts from science, engineering, economics, and social sciences and including as official stakeholders one member from a water deficit state and one member from a water surplus state. It will address the following broad issues: provide guidance for norms of appraisal of individual projects vis-à-vis their economic viability, socio-economic impacts, environmental impacts, and preparation of resettlement plans; develop a mechanism for speedy consensus amongst states; prioritize different projects; propose organizational structures for implementing the project; consider funding modalities for the project; and consider the international ramifications of the project. The completion date for achieving the goal of the interlinking project is December 31, 2016 (Ministry of Water Resources 2002).

Amidst rapid development and urbanization, outdated systems of managing water resources; it is the high time for India to come forward in all-out manner to transform this dream project into a big reality. Fact is that the ILR projects are site and requirement specific depending upon the hydrological, geological, topographical and regional conditions. It is essential that needed

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environmental safeguards are properly implemented in a coordinated manner by various agencies. We have to develop a range of models that agree to use shared data sets and explore definitions of water use/ consumption.

If water transferred from water abundant rivers to water-deficit areas, there would be adequate supply for everyone in every part of the country. It also appears to promote national integration and a fair sharing of the country‟s natural water wealth. India‟s river linking project shows and promises a great concern for water conservation and optimum use of available water resources. Undoubtedly, it is the need of the hour to have a water mission like as IRL, which will enable availability of water to the fields, villages, towns and industries throughout the year, even while maintaining environmental purity to combat with both fold and drought simultaneously.

The problem of providing domestic water supplies in areas away from the rivers will largely remain unsolved, even if the interlinking project is completed. IRL Project may not have much effect on improving the supply situations in the 142 Geo-Eco-Marina 9/2013 Dharmendra Mehta, Naveen K. Mehta– Interlinking of Rivers in India: Issues & Challenges

vast dry areas that are in the higher parts of the basins and away from the rivers to be interlinked rivers, and therefore, most critically will have to depend on local rain water. Thus, the gigantic construction in the name of delivering water to the water scarce areas may prove to be not the most cost-effective way of doing so. Most of the rural areas are suffering from water scarcity; there is no alternative available at local level for harvesting of water. For these areas, the option of long distance transfer may not be a good idea. Some of the major criticisms of the project are about its socioeconomic viability, environmental impacts, displacement and rehabili-tation of affected people, the challenge of resource mobilization, geo-political constraints, as well as domestic political dynamics.

In the case of the interlinking project, no official figure is available for the number of people to be displaced. It is estimated that the network of canals extending to about 10,500 km would displace about 5.5 million people, who are mostly tribals and farmers (Vombatkere, 2003). On

the 23rd of May 2003, the Ministry of Environment and Forests put out a 23-point concern about the environmental implications of the proposed interlinking project. These included the sub-mergence of forests and cultivable areas, displacement and resettlement and serious implications in terms of bio-diversity loss (Hazarika, 2003). Scientists are also doubtful that river diversion would bring drastic changes in the physical and chemical compositions of the sediment load, river morphology and the shape of the delta formed at the river mouth. All these have serious economic and livelihood implications that are merely ignored by the project. There is an urgent need to take Socio- environmental concerns related to IRL Project so a very detailed hydrological, geological, meteorological and environmental analysis of the project would be imperative in the benefit of India. There is an acute need for examining the presuppositions on which the whole interlinking project has been conceived.

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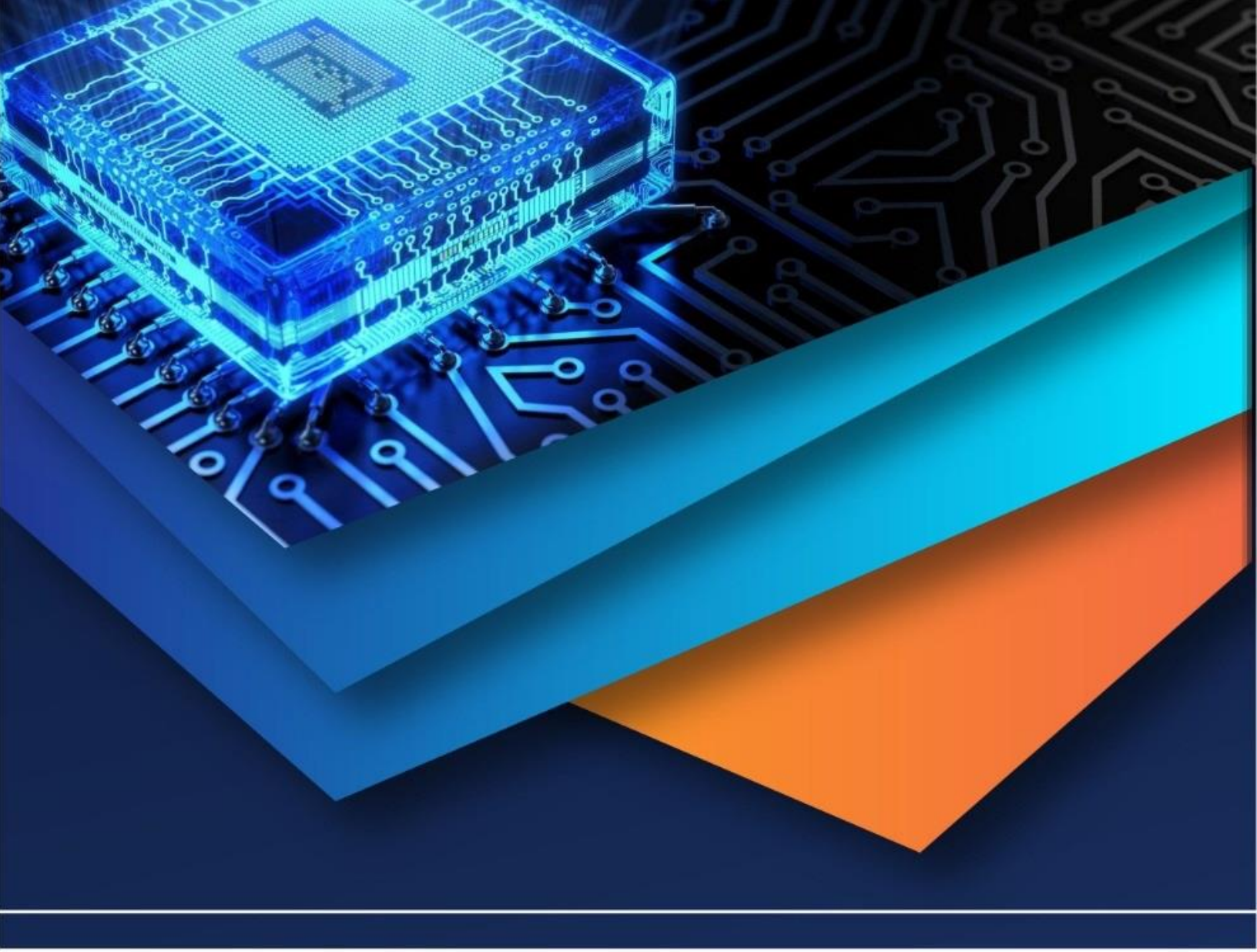
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