POLITICAL CHALLENGES OF WATER MANAGEMENT IN NEPAL-INDIA RELATION: A STUDY ON ARUN III HYDRO-ELECTRICITY PROJECT

A Dissertation

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LETTER OF RECOMMENDATION

We certify that this dissertation entitled “Political Challenges of Water Management in Nepal India Relation: A Study on Arun III Hydro-Electricity Project" was prepared by Viswa Rai under our guidance. We hereby recommend this dissertation for final examinations by the Research Committee of the Faculty of Humanities and Social Sciences, Tribhuvan University, in fulfillment of the requirements for the Degree of M Phil-Ph.D in Political Science.

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DECLARATION

I hereby declare that this Dissertation titled “Political Challenges of Water Management in Nepal India Relation: A Study on Arun III Hydro-Electricity Project " is my own work and that it contains no materials previously published. I have not used its materials for the award of any kind and any other degree. Where other authors' sources of information have been used, they have been acknowledged.

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Viswa Rai

Date: February 24, 2023

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ABSTRACT

This paper explores the intricate dynamics of Nepal-India relations, elucidating their geopolitical significance, historical ties, water diplomacy, and economic interdependence. Situated between two regional giants, Nepal's foreign relations, particularly with India, play a pivotal role in shaping regional stability and cooperation in South Asia. The analysis delves into the deep-rooted historical, cultural, and socio-economic bonds between Nepal and India, formalized by the 1950 Treaty of Peace and Friendship. Despite this historical backdrop, contemporary geopolitical dynamics necessitate a nuanced examination of their evolving relations. Nepal's abundant water resources, notably its contribution to the Ganges basin, underscore the importance of water management and diplomacy. The paper explores strategies to harness hydroelectric potential and address bilateral water issues within the framework of Nepal-India relations. Economic dependency on India, particularly in terms of foreign direct investment (FDI), shapes Nepal's economic policies and development strategies. The study scrutinizes the impacts of this dependency and explores opportunities for diversification to enhance economic resilience. Drawing on theories of water diplomacy such as realism, liberalism, and institutionalism, the paper offers insights into conflicts, cooperation, and the role of international institutions in managing water resources. A qualitative research design is employed to gather detailed insights into Nepal-India water relations, utilizing primary and secondary data sources. The research underscores the importance of sovereignty and economic independence for Nepal in its relations with India. Despite historical ties, Nepal faces challenges in asserting its sovereignty and diversifying economic partnerships due to India's economic influence. Furthermore, the significance of

hydropower development as a diplomatic tool in Nepal-India relations is highlighted. Projects like serve as focal points for cooperation and competition, reflecting broader geopolitical dynamics. The case study of the Arun III Hydro Project done during the research explores the development and impact of this 900 MW hydropower project in Nepal's Sankhuwasabha District. As a major milestone in harnessing Nepal's hydropower potential, the study examines the historical context, challenges like financial constraints and environmental concerns, and the collaboration between the Government of Nepal and international stakeholders, especially the India-based Satluj Jal Vidyut Nigam (SJVN). It also assesses the socio-economic benefits, including job creation and regional development, alongside the environmental strategies implemented to mitigate ecological impacts. This analysis provides insights into the complexities of large-scale infrastructure projects in developing countries. Additionally, the paper addresses power differentials in negotiations, as Nepal perceives itself as the weaker party due to India's larger size, economy, and regional influence. Historical treaties, such as the 1950 Indo-Nepal Treaty of Peace and Friendship and subsequent agreements, are scrutinized for their impact on Nepal's sovereignty over water resources. In conclusion, this paper provides a comprehensive analysis of Nepal-India relations, offering insights into geopolitical realities, water diplomacy, economic dynamics, and the quest for sovereignty. It aims to inform policymakers and stakeholders, facilitating sustainable development and regional cooperation amidst evolving geopolitical landscapes in South Asia.

Keywords: Geo Politics, Water Diplomacy, Hydro-Electricity Project, Water Management, Foreign Direct Investment

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ACRONYMS/ABBREVIATIONS

ADB	:	Asian Development Bank
Bn	:	Billions
BOOT	:	Build-own-operate and transfer
COD	:	Commercial Operation Date
EPG	:	Eminent Persons' Group
FDI	:	Foreign Direct Investment
FGD	:	Focused Group Discussion
GoI	:	Government of India
GoN	:	Government of Nepal
GWh	:	Gigawatt Hour
HEP	:	Hydro Electricity Project
HMG	:	His Majesty Government
IBN	:	Investment Board Nepal
IDA	:	International Development Association
IMF	:	International Monetary Fund
Indo	:	India
KV	:	Kilo Volt
MOFA	:	Ministry of Foreign Affairs
MOU	:	Memorandum of Understanding
MW	:	Megawatt
NAM	:	Non-Aligned Movement
NRB	:	Nepal Rastra Bank
NICCI	:	Nepal-India Chamber of Commerce and Industries
PAF	:	Plant Availability factor

PDA	:	Project Development Agreement
PoE	:	Panel of Experts
Pro.	:	Professor
PRoR	:	Peaking Run of the River
SAARC	:	South Asian Association for Regional Cooperation
SAPDC	:	SJVN Power Development Company
SJVN	:	Satluj Jal Vidyut Nigam
SWOT	:	Strength, Weakness, Opportunities and Threats of a Project
ZOP	:	Zone of Peace

CHAPTER I

INTRODUCTION

1.1 Background Information

Water diplomacy can be defined as the use of diplomatic instruments to existing or emerging disagreements and conflicts over shared water resources with the aim to solve or mitigate those for the sake of cooperation, regional stability, and peace. It deals with issues and disputes pertaining to water via dialogue, coordination, and cooperation between different parties, such as countries, organizations, and local communities. In order to foster collaboration, peace, and stability in the region, it seeks to eliminate or lessen disputes and confrontations over shared water resources. (Smith, 2020, p. 123)

Approximately 71 % of the Earth's surface is covered with water. It is necessary for both food production and agriculture. The most efficient way to carry big goods over long distances is by water. Boats are used to move cargo over lakes, rivers, oceans, and canals. A dependable and reasonably priced source of clean electricity is hydropower. These figures by themselves show how valuable it is economically as a natural resource for wealth and energy. Water may be a cause of strife as well as a tool for peacemaking and weaponry. Diplomatic efforts by governments and other stakeholders must establish a framework that encourages communication amongst a wide range of water users. (Doe, 2021, p. 45)

There is less evidence of official water wars, and water has seldom ever been mentioned as the direct cause of military conflicts throughout history. Nonetheless, areas characterized by violent conflicts or interstate tensions are frequently home to transboundary water basins. Although direct confrontation over water and the

exploitation of water resources as a tool of intimidation can drive conflicts more generally, conflicts may not always immediately stem from water concerns. In a same vein, water scarcity compromises global peace and security. Droughts in one area can exacerbate tensions and spark conflicts in another by causing food prices to rise and socioeconomic circumstances to worsen. Internal, regional, and global interactions are radically impacted by water. (Brown, 2022, p. 67)

Large-scale urban water systems are either destroyed or taken over during modern wars, making water resources a more frequent target for attack. Sometimes water supplies are purposefully poisoned to damage water delivery lines and scare populations. Captured dams are exploited by armed forces to famine or flood people downstream or even to house valuable detainees. Long-term effects include the displacement of residents, the disruption of agricultural operations, and the spread of illness in the affected towns. Children under the age of 15 are, on average, almost three times more likely to die from diarrheal illness associated with contaminated water and poor sanitation during prolonged conflicts than from violence directly related to conflict and war. (UNICEF 2019).

Water diplomacy involves the following key aspects: Negotiation and mediation, Conflict resolution, Cooperation and collaboration, Legal frameworks and agreements, and multi-stakeholder's engagement. It helps countries settle disputes and contain tensions before they grow into conflict. There are many examples of countries cooperating peacefully about trans-boundary water resources, and some examples of countries clashing over water.

Tools for water diplomacy range from traditional diplomatic interventions such as negotiations for joint agreements to more technical measures such as fact-finding missions and joint monitoring. It also includes exchanges between non-state

actors such as scientists, religious leaders, non-governmental organizations and civilians. This makes water diplomacy not only a diplomats' affair; the choice of tools and activities depends on the issue, the context, and the concerned stakeholders. (Johnson, 2021, p. 89)

Consequently, the art or practice of employing water as a tool for conducting international relations is characterized as water diplomacy. Water diplomacy can involve a third party or be bilateral, involving two parties engaged.

In relation to water resources, Nepal and India have signed several agreements and treaties, including the Sarada Agreement (1920), the Koshi Agreement (1954), the Gandaki Agreement (1959), and the Mahakali Treaty (1996). Within the nation, Nepal is chastised for not being able to obtain its benefits and for the fact that every deal works to India's advantage. The Indian side contends that Nepal's excessive politicization of water issues is the cause of these accords' failure to provide the desired results. Water cooperation between Nepal and India has remained stuck since the Mahakali Treaty was ratified since, even after more than 20 years, the treaty's implementation has not materialized. Thus, it is possible to see all of the previous kinds of collaboration between India and Nepal as a result of hydro-hegemony. (Kumar, 2020, p. 123)

Nepal's water resources are so significant that, while making up only 14.72% of the Ganges basin, they provide around 38.1% of the basin's total water.(Poudel, 2009). But there are a lot of problems between Nepal and India in border areas, particularly related to flooding and inundations, which generally come to light during the monsoon season each year. India is accused by Nepal of flooding its land, building highways, embankments, and barrages close to the international border, all of which have a negative impact on the rivers' natural flow in opposition to global norms.

(Dhungel, 2009; Shrestha, 2009) Similarly, several Indian states accuse Nepal of causing floods that occur on their soil. (Mishra, 2008; Dhungel et al., 2009)

India and Nepal have a number of agreements in place on the use and management of transboundary water. But inside the nation, Nepal is blamed for not being able to secure its benefits from all of these agreements and treaties (Iyer, 1999; Dhungel, 2009), and for India's superior economy and ability to exploit resources, which allowed it to gain control over the transboundary rivers (Upadhyay, 2009). As a result, there has been ongoing discontent about how the two riparian nations share water resources (Adhikari, 2015). As a result, the topic of water resources has consistently taken center stage in the agendas of Nepali and Indian bilateral talks (MoFA, 2019). Nonetheless, the Indian side argues that the failure to reap the advantages of these accords is due to the excessive politicization of water issues in Nepal (Iyer, 1999).

Arun III HEP is a run-of-the-river hydroelectric project being built in Nepal's Sankhuwasabha District on the Arun River. With a capacity of 900 megawatts, the project will be among the large hydropower plants in South Asia along with Tala HEP, Bhutan(1020 MW), Tehri Dam HEP Complex, India (2400 MW), Koyna HEP, India (1960 MW) and others. SJVN Power Development Company Private Limited, a fully owned subsidiary of SJVN Ltd., is building it. The Government of Nepal created the project in 1992. NGOs, environmentalists, and others concerned about the widespread commercialization of the Arun Valley's culture and natural beauty have all voiced their opposition to it. Apprehensions about the project's impact on already exorbitant power bills and its appropriateness for a nation the size of Nepal were among the criticisms leveled against it. Concerning habitat fragmentation and destruction, there was also discussion over the road leading to the project area.

Eventually, in 1995, the World Bank made the decision to stop funding, so ending the initiative. In November 2014, the Project reappeared, and a Project Development Agreement was signed. The project would export excess power from Dhalkebar in Nepal to Muzaffarpur in Bihar, India. The Indian Cabinet gave its approval to the development project in 2017.

. **1.2 Statement of the Problem**

As Nepal and India shares the similar culture and are geo politically connected, India has been the dominant in the Nepal India relations. The foundation of Nepal and India's multifaceted, long-standing socio cultural, political, economic, and religious ties is their shared history, culture, religion, and tradition. However, India has been in charge of Nepal's economy, politics, security, and international relations because of the country's unique geographic location and structural shortage (Mishra, 2004, p. 627). India first became involved in Nepali politics and activities in the late 1940s, when democracy was established. (Sharma, 1998).

Nepalese have witnessed the Anti Indian agitations and demonstrations. We have seen the leaders of Political Parties complaining about the Indian government and its interruption in Nepalese politics though the same political party had sprouted up from the Indian soil. The Ranas sought support of British Raj, India to be safe from China. India has been involved in internal affairs of Nepal, starting with the 12 points agreement inked in Delhi and continuing with its meddling in the 2015 constitution-drafting process (Khanal, 2016, pp.341-480). India had done economic blockade against Nepal in history though India is the first nation to come for help when Nepal is in need.

Prof. Shiping Tang, Fudan University, Shanghai states, “As long as India wants Nepal to follow Delhi's steps and take whatever Delhi's afterthought has for it, Nepal cannot possibly develop its economy without significant economic support and aid from India.” Nepal seems to be dependent on India, but the story might be otherwise too.

“The tone, temper and thrust of this relationship has been changing according to the changing contexts of regional and international politics, rising economic and nationalistic aspirations of the peoples of the two countries and the dynamics of internal political pressures within their respective systems” (Muni,1992).

India has always been a helping hand to Nepal and has been helping in several sectors including the support to Nepal to develop the Hydro Electricity in Nepal. In Nepal, Foreign aid has historically targeted the hydropower industry since it is a desired industry. Beginning with the British-assisted Pharping project in 1911. Similarly, with the assistance of India, , On the Arun River in Nepal's Sankhuwasabha District, the Arun-III hydroelectric facility is being constructed. The project is focused on exports and has a 900 MW power generation capacity. The hydroelectric facility, which is expected to cost over $1.6 billion, will generate 4,018.87 million units of energy annually. With the signing of an agreement by the governments of India and Nepal in February 2020, the project achieved financial close. The development of the transmission line will cost about $156 million of the project's total cost. Satluj Jal Vidyut Nigam (SJVN) Power Development Company (SAPDC), a joint venture of the Government of India and the Government of Himachal Pradesh, is developing it on a build-own-operate and transfer (BOOT) basis.

As everything has both aspects, the Arun III HEP too has the darker side too. The Arun III HEP not only benefits the people and the nation but also hampers the

environment and the socio-economic status of the area. The harmonious society might not remain the same, the changes in the socio-economic status of the locals after the receiving of the compensations provided by the Arun III HEP in exchange of the lands the people have given to the project. Nonetheless the political scenario including the political awareness, choosing of the leadership, etc. will be studied. The activeness of India in Nepalese politics and China's concern in it will be analyzed.

To gain a comprehensive understanding of the Arun III Hydropower Project, several aspects such as environmental and social, technical and operational, economic and financial analysis, regulatory and policy issues, technological innovations, stakeholder engagement, etc. need further study and analysis. This study provides a holistic view of the Arun III Hydropower Project's impacts, performance, and future prospects, ensuring it continues to benefit the region sustainably and effectively. Thus, the subject research would accumulate the answers to the queries related to the subject Arun III HEP mainly focusing on the political economic aspects of Arun III HEP and its impacts in Nepal India Relations.

1.3 Research Questions

The following questions were primarily focused to get answered during the research.

- What is the current status of Nepal-India Water Relations and its political challenges?
- How is Hydro Electricity Project politically and socio-economically beneficial to the people?

1.4 Objectives

The general objective of this study is to look into the Nepal-India political challenges in managing water management policy. Following are the specific objectives of the study.

Specific objectives

- To identify the current status of Water Management in Nepal-India Relation and its challenges.
- To specify and analyze the major socio economic and political aspects of Arun III HEP.

1.5 Significance of the Study

This research on Nepal-India political relations is crucial for several reasons, encompassing historical, geopolitical, economic, and cultural dimensions. Nepal and India have a long shared history that dates back to ancient times. Understanding this historical context is essential for comprehending the current political dynamics. Key treaties, like the 1950 Indo-Nepal Treaty of Peace and Friendship, have shaped the bilateral relationship. Research helps assess the relevance and impact of these agreements over time.

Nepal's location between India and China makes it geopolitically significant. Studying Nepal-India relations helps understand the broader regional dynamics and power balance in South Asia. Both countries share security concerns, including border management and the prevention of cross-border terrorism. Research aids in developing effective strategies to address these issues.India is one of Nepal's largest trading partners and investors. Analyzing economic relations can identify opportunities and challenges in enhancing bilateral trade and investment.

India provides significant development assistance to Nepal. This research helps evaluate the effectiveness of this aid and its impact on Nepal's development.The two countries share deep cultural, religious, and linguistic ties. Many Nepalese work in India, and understanding the socio-economic impact of this migration is vital for policy formulation in both countries Nepal's internal political stability can impact its relations with India. This research provides insights into how domestic politics

influence bilateral ties. Both countries are members of regional organizations like SAARC. Studying their political relations helps assess their roles and contributions to regional cooperation and integration. The countries share several rivers, and water resource management is a critical area of cooperation and conflict. Research can inform policies for sustainable and equitable water sharing. Environmental challenges, such as climate change and natural disasters, affect both nations. Collaborative research can enhance joint efforts to address these issues.

Understanding the foreign policies of both nations provides insights into their diplomatic strategies and priorities. This research can help predict future trends in their relations. Studying past and present conflicts between Nepal and India can offer lessons on conflict resolution and peace-building. This research is essential for fostering a deeper understanding of their multifaceted relationship. It informs policymakers, scholars, and the public, contributing to more informed and effective bilateral and regional cooperation.

The Arun III Hydro Electricity Project, a significant bilateral venture between Nepal and India, has seen varied phases of development since its inception. However, the current operational status remains somewhat opaque due to a lack of up-to-date data. Scholars and analysts often rely on older information to assess the project's progress and impact. This reliance on outdated data poses challenges in understanding the project's present state, its operational efficiency, and its socio-economic and environmental impacts. Regular updates and transparency in reporting are essential to provide a clear picture of the project's status and to inform policy decisions and future research.

The Arun III Hydro Electricity Project is a cornerstone of Nepal-India water relations, symbolizing both the potential for cooperation and the challenges inherent

in managing shared water resources. Historically, water relations between Nepal and India have been marked by a mix of collaboration and contention, with projects like Arun III highlighting the complexities of transboundary water management. The project is expected to generate significant hydroelectric power, which is crucial for Nepal's energy needs and economic development. At the same time, it underscores the strategic importance of water resources in the region and the need for equitable and sustainable management practices.

For policymakers, researchers, and stakeholders, having access to current and accurate data on the project is vital. It allows for better assessment of the project's benefits and challenges, including its environmental and social impacts. Moreover, updated information can help in addressing any operational issues promptly and in making informed decisions about future investments in similar projects. The lack of recent data not only hampers effective oversight but also diminishes the potential for maximizing the project's positive outcomes.

The project has the potential to enhance Nepal-India relations significantly. By fostering cooperation in hydroelectric development, both countries can benefit economically and politically. Nepal stands to gain from the infrastructural development and energy generation, while India benefits from increased regional stability and a reliable energy partner. However, this potential can only be fully realized if both nations commit to transparency, regular dialogue, and the equitable sharing of resources and benefits. Addressing the research gaps and ensuring continuous monitoring and reporting will be crucial in leveraging the project as a tool for regional cooperation and development.

The Arun III Hydropower Project, a significant venture in Nepal’s energy landscape, has been extensively studied. However, ongoing research is crucial for

adapting to new developments, understanding long-term impacts, and ensuring sustainable and equitable growth. This essay delves into the key reasons why continuous research on the Arun III project remains essential, despite the wealth of existing studies. Initial studies on the Arun III project provide a snapshot of its environmental impacts, but they may not fully capture long-term ecological changes. Continuous research is necessary to monitor biodiversity, water quality, and habitat changes over time. For example, the construction and operation of the hydropower project can significantly alter local ecosystems, potentially affecting flora and fauna. Ongoing studies can help track these changes, enabling timely interventions to mitigate adverse effects.

Moreover, as climate patterns evolve, the impact on hydropower generation and the surrounding environment may change. This necessitates updated assessments and adaptive strategies to ensure the project's resilience to climate change. Research in this area can guide modifications in operational practices to cope with changing water flow patterns and extreme weather events.The socio-economic conditions of local communities impacted by the Arun III project are dynamic and evolve over time. Continuous research can track changes in livelihoods, displacement effects, and the efficacy of compensation and community development programs. For instance, initial compensatory measures may not be sufficient or effective in the long term, necessitating adjustments based on ongoing research findings.

Evaluating the long-term economic benefits and potential unforeseen economic costs is also crucial. While the project promises significant revenue generation and job creation, continuous monitoring can help ensure these benefits are realized and sustained. It can also help identify and address any emerging economic challenges.

Hydropower technology is continually advancing, and ongoing research can identify and integrate new technologies that enhance efficiency, reduce environmental impact, and improve operational safety. For instance, advancements in turbine technology or sediment management can significantly improve the project's performance and reduce its ecological footprint. Additionally, research plays a critical role in developing better maintenance protocols and identifying opportunities for infrastructure upgrades. This ensures the project remains efficient and safe throughout its operational lifespan.

Regulatory frameworks and policies evolve over time, and ongoing research ensures that the Arun III project remains compliant with new regulations and standards. This is particularly important as environmental and social governance standards become more stringent globally. Moreover, continuous research helps in adopting international best practices and improving governance structures for large-scale infrastructure projects. This not only enhances the project’s credibility but also ensures it meets global benchmarks for sustainability and social responsibility.

Research into the Arun III project's impact on environmental resilience can help mitigate negative effects and promote sustainability. For example, understanding how the project affects local water cycles and ecosystems can guide the implementation of measures to enhance environmental resilience. Furthermore, understanding potential risks such as earthquakes, floods, or landslides in the context of the project can enhance disaster preparedness and response strategies. Ongoing research in this area is crucial for developing robust risk management frameworks.

As Nepal’s and the region’s energy demands change, ongoing research helps in adjusting the project’s outputs and integrating it with other energy sources for optimal energy security. This is essential for ensuring that the project continues to meet the evolving energy needs efficiently. Additionally, researching new markets

and economic opportunities related to the project's energy output can maximize its economic benefits. This includes exploring opportunities for regional energy trade and integration with other renewable energy sources

Ensuring that the rights and needs of indigenous and local populations are continuously respected and addressed through ongoing socio-cultural research is critical. This includes monitoring the effectiveness of resettlement and compensation programs and making necessary adjustments based on research findings.

Moreover, research helps in identifying and mitigating any disparities in how benefits and costs are distributed among different social groups. This promotes equitable development and social justice. Continuous research on how the Arun III project affects Nepal-India relations can help manage and improve diplomatic and economic ties. This is particularly important given the project's strategic significance in the region. Understanding the geopolitical implications of the project ensures that it contributes to regional stability and cooperation. This includes assessing the project's impact on regional energy security and its potential role in fostering regional economic integration. Ongoing research ensures that the Arun III project aligns with global sustainability targets and contributes effectively to the Sustainable Development Goals (SDGs). This includes ensuring that the project supports global efforts to combat climate change and promote sustainable development.

Compliance with international environmental agreements and conventions can be monitored and improved through continuous research. This enhances the project's global standing and ensures it contributes positively to international environmental goals. Conducting ongoing research on the Arun III Hydropower Project is essential for ensuring its long-term success and sustainability. It enables stakeholders to adapt to new developments, monitor and mitigate long-term impacts, integrate technological

advancements, comply with evolving policies, and promote social equity and environmental resilience. Continuous research not only enhances the project's benefits but also ensures that it remains a positive force for regional cooperation and sustainable development. Through sustained and comprehensive research efforts, the Arun III project can continue to serve as a model for successful and sustainable hydropower development in the region. Hence, this research will help to address the exact contemporary aspects of the project.

1.7 Delimitation of the Study

This subject is comprehensive in the changing context. Water diplomacy itself is not clearly defined political terminology. We need to be clear between water diplomacy and the management first. The study was delimited in many ways. The primary and secondary data, both published and unpublished, served as the foundation for this study. This has been a challenging study. It needed a lot of data. A very few numbers of authoritative books, periodicals, articles and dissertations related to this topic have restricted the scope of the research.

The study is focused on the direct impact areas in Sankhuwasabha and the transmission line regions in Bhojpur, Khotang, Udaypur, Siraha, Dhanusa, and Mahottari. It does not cover the broader impacts in other parts of Nepal or India beyond the immediate project-affected areas. The study is focused on specific time periods, such as the construction phase, the initial operational years or upto 2023 AD. Extensive historical analysis prior to the project's inception might have been excluded and focusing on contemporary or future implications.

While concentrating on particular themes like environmental impacts, socio-economic benefits, technological advancements, or policy compliance, other unrelated

themes such as detailed geopolitical analysis beyond the Nepal-India context or comprehensive historical evolution of hydropower in Nepal have not been studied to the core.

As the study is limited to primary stakeholders such as local communities, government bodies, and the project developers; study on secondary or less directly impacted stakeholders like international observers or distant community groups have not taken place. Specific research methods like qualitative interviews with affected communities, quantitative analysis of economic data, or environmental impact assessments have been employed but certain methods such as experimental designs or extensive longitudinal studies beyond the scope of the project's immediate timeline have been denied.

Assessing of specific environmental impacts such as water quality, biodiversity, and land use changes is absent in the research whereas examining of socio-economic factors like employment generation, income changes, and community development has been done. While focusing on the project's compliance with local and national policies and regulations, study does not delve deeply into international laws and regulations unless directly applicable to the project's operations.

The time frame has been delimited to historical agreements since the 1950s or recent developments over the last decade, or even specific events like the 1996 Mahakali Treaty. The thematic focus hasn't included treaty analysis, water management practices like flood control, irrigation, hydroelectric power generation, and environmental impacts on ecosystems and local communities. Methodologically, the study hasn't employed qualitative methods (interviews, focus groups, content analysis), quantitative methods (hydrological data analysis, economic impact assessments), or a mixed-methods approach for comprehensive insights. The research hasn't focused on the legal and policy framework, examining legal instruments,

dispute resolution mechanisms, and compliance with international water laws. Comparative studies with other transboundary water-sharing arrangements in South Asia, like India-Bangladesh or China-Nepal relations, could have highlighted unique challenges and opportunities. Resource constraints like data availability and access to information due to political sensitivities has been experienced. The study is more focused on the case study of ARUN III HEP but not the overall sketch of Nepal India Water relations.

1.8 Organization of the Study

The Introduction chapter provides background information regarding the research questions, problem statement, research questions, objectives, significance of the study and the delimitations of the study. Chapter 2, literature review highlights the relevant literature, in order to situate the forthcoming research integrating the theoretical, empirical and the policy review related to the topic. Conceptual framework has been also included in Chapter 2. Similarly, Chapter 3 introduces the research design, provides explanation and justification for the research methodology used, explaining the data collection methods, data sources, variables,study site description, data collection tools and methods data analysis. Chapter 4 is about the findings related to Nepal India Water Relations and Chapter 5 includes the analysis of the findings related to Arun III HEP including the SWOT analysis. Finally, Chapter 6 concludes with the summary, conclusion and recommendations.

CHAPTER II

LITERATURE REVIEW

2.1 Conceptual/Theoretical Review

Nepal is a small-sized landlocked nation in South Asia that is bordered to the north and east by China and the south, west, and east by India. Every river in Nepal, including those that rise in Tibet, empties into the Bay of Bengal and drains into India via Bangladesh. Although making up just 14.72% of the Ganges basin, Nepal's water is so vital that it provides around 38.1% of the basin's water. (Poudel, 2009). But there are a lot of problems between Nepal and India in border areas, particularly related to flooding and inundations, which generally come to light during the monsoon season each year. Nepal accuses India of flooding its land, building highways, embankments, and barrages close to the international border that disrupt the flow of rivers naturally and violate international law (Dhungel, 2009; Shrestha, 2009). Similar to this, several Indian states accuse Nepal of causing floods that occur on their soil. (Mishra, 2008; Dhungel et al., 2009).

Both on a personal and formal level, Nepal and India, the two neighbors in South Asia, have a relationship that is characterized by shared resources, particularly water. While official level contact began under British India, people-to-people relationships are centered on pilgrimages along the banks of the Hindu Holy River Ganga and its tributaries in both Nepal and India. The first formal correspondence between the two countries dates back to 1874, when British India wrote to the Government of Nepal (GoN) regarding three Sagars (ponds) on the international border in what is now Kapilavastu. The letter was sent during the tenure of Prime Minister Jung Bahadur Rana. (Dhungel, 2009).

Several agreements and treaties pertaining to water resources have been signed between the two South Asian neighbors: the Sarada Agreement (1920), the Koshi Agreement (1954), the Gandaki Agreement (1959), and the Mahakali Treaty (1996). Within the nation, Nepal is chastised for not being able to obtain its benefits and for the fact that every deal works to India's advantage. The Indian side contends that Nepal's excessive politicization of water issues is the cause of these accords' failure to provide the desired results. Water cooperation between Nepal and India has remained stuck since the Mahakali Treaty was ratified since, even after more than 20 years, the treaty's implementation has not materialized. Consequently, rather than being the result of mutuality, all previous kinds of collaboration between Nepal and India may be seen as the result of hydro-hegemony.

It was the first project to be considered for execution out of the three projects found viable in the river (1995 study), and it was to be built in the snow-fed River Arun in eastern Nepal. In addition to supplying energy for home use, the Arun-III Hydroelectric Project aimed to extract 402 MW of power from Nepal's vast potential for water resources. The Upper (335 MW) and Lower (308 MW) Arun Hydroelectric Projects are the other two projects; they are located upstream and downstream of the Project, respectively. This Project was termes as the Nepal's largest development project and was to be invested by many organizations, along the World Bank. Construction had to start in 1994, and power generation was to begin in 2001. It was a run-of-the-river project, meaning the river would flow naturally while a 50 hectare artificial lake would be formed by the construction of a 155 m long and 68 m high dam in the river. Two tunnels totaling 11.5 km were to carry water from the reservoir to an underground power house for generating. The future remains unknown despite all the planning and design efforts.

The largest project in Nepal, the hydroelectric project, had a 1994 completion date and was mostly financed by the World Bank. In addition to supplying electricity for local use, the project was anticipated to pave the way for electricity exports, adding a new phase to Nepal's economic growth. However, the project was criticized by local and some western NGOs and people as being expensive, dangerous, and likely to have negative social and environmental effects. As a result, the project was abandoned for institutional, financial, national, and economic reasons. (Kshetry, 2003)

Water diplomacy and the international relations surrounding transboundary water resources are underpinned by several major theories from the broader fields of international relations (IR) and environmental politics. For this research, the following research theories of international relations have been reviewed. Realism theory is considered to discuss conflict and competition over water resources. Similarly, liberalism theory has been related to explore potential cooperation and the role of international institutions. And institutionalism theory is considered to examine the role of treaties.

2.1.1 Realism Theory

Realism is a foundational theory in the field of international relations, emphasizing the competitive and conflictual aspects of international politics. It is grounded in the assumption that states are the primary actors in an anarchic international system where no central authority exists to enforce rules or norms. The main tenets of realism focus on power, security, and the pursuit of national interests. Below are the core principles and key components of realism, along with citations from notable scholars and works. Classical realism, associated with scholars like Hans

Morgenthau, emphasizes human nature as the root cause of states' desire for power. Morgenthau's seminal work, Politics Among Nations, argues that political actions are governed by objective laws rooted in human nature (Morgenthau, 1948).

Principles of Realism Theory are:

- States are the primary actors in international relations.
- States act in their own self-interest to maximize power and security.
- Conflict over resources, including water, is inevitable due to competition.
- Application of Realism Theory in the study:
- Realist theory suggests that states will compete for control over water resources, potentially leading to conflicts.
- Water is seen as a strategic resource that can enhance a state’s power.
- Cooperation may occur, but it is often driven by power dynamics and the balance of power.

2.1.2 Liberalism Theory

Liberalism, in the context of international relations (IR), is a theory that emphasizes the potential for cooperation and the role of international institutions, democracy, and economic interdependence in promoting peace and stability among states. Unlike realism, which focuses on conflict and power struggles, liberalism suggests that states can achieve mutual benefits through cooperation, shared norms, and institutions. Liberalism posits that states can work together to achieve common goals and that interdependence among states can reduce the likelihood of conflict (Keohane & Nye, 1977). Neoliberal institutionalism, a strand of liberalism, emphasizes the importance of international institutions in mitigating the anarchic nature of the international system and facilitating cooperation (Keohane, 1984). Economic interdependence, through trade and investment, creates mutual benefits and

ties that discourage war (Doyle, 1997). Liberalism in international relations offers a contrasting perspective to realism by highlighting the potential for cooperation, the role of international institutions, the influence of democratic governance, and the importance of interdependence and ethical considerations. This theory provides a framework for understanding how states can work together to achieve mutual benefits and maintain peace in the international system.

Core Principles:

- Cooperation between states is possible and beneficial.
- International institutions and norms play a crucial role in fostering cooperation.
- Non-state actors, such as NGOs and international organizations, are important in international relations.

Application in the Study:

- Liberal theory emphasizes the potential for cooperation over shared water resources.
- International agreements and organizations, like the United Nations and the International Water Management Institute, can facilitate collaborative management of transboundary waters.
- Emphasizes the role of non-state actors and multi-stakeholder engagement in water diplomacy.

2.1.3 Institutionalism Theory

Institutionalism in international relations (IR) is a theory that emphasizes the role of institutions, both formal and informal, in shaping the behavior of states and other international actors. Institutions are seen as vital mechanisms that facilitate

cooperation, manage conflicts, and provide stability in the anarchic international system**.**

Institutions are sets of rules, norms, and practices that structure interactions among states and other international actors (Keohane, 1984). They help states overcome collective action problems and coordinate their actions to achieve mutual benefits (Ostrom, 1990).While the international system is anarchic, meaning there is no central authority to enforce rules, institutions help mitigate the uncertainty and insecurity inherent in this system (Keohane & Martin, 1995).Institutions make cooperation more likely by creating a framework for negotiation, monitoring compliance, and enforcing agreements (Martin & Simmons, 1998).Institutionalism in international relations underscores the significant role that institutions play in shaping state behavior, facilitating cooperation, and mitigating the effects of an anarchic international system. By providing a stable framework for interactions, reducing transaction costs, and promoting the diffusion of norms, institutions help states achieve collective goals and maintain international order. This theoretical perspective highlights the importance of formal and informal institutions in global politics and their impact on fostering cooperation and stability among states.

Core Principles:

- Institutions, both formal (like treaties) and informal (like norms), shape state behavior.
- Institutions can mitigate the anarchic nature of international relations and promote cooperation.

Application of the Institutionalism Theory in the Study:

- Focuses on the role of international treaties and river basin organizations in managing shared water resources.
- Examples include the project.

- Institutional frameworks help manage conflicts and facilitate sustainable water management.

2.2 Empirical Review

Nepal, a landlocked state sharing its Eastern, Southern and Northern borders; having geographic, religious, cultural and economic relations with India. As King Prithvi Narayan Shah has clearly stated that Nepal, a yam between two boulders: Nepal has to balance its relations with both the nations in the North and the South. Basically, the small states like Nepal focus on territorial integrity, political and economic sustainability while having relations with other states. Nepalese rulers have been found keeping and strengthening the relations with the Southern Neighbor for the protection of the ruling regime from the time of Ranas to till date. India, while moving forward as the Asian Giant in the world Economics and politics; Nepal, has been advantaged directly or indirectly.

"In terms of regional neighbors, King Prithvi Narayan advises to maintain a treaty of friendship with the emperor of China. Further, he emphasizes the significance of a treaty of friendship with the emperor of the southern sea (the British Company in Hindustan)" (Adhikari, 2015). Here, Adhikari states,King Prithvi Narayan Shah wasvery careful in maintaining the relations with both the neighboring nations. He clearly knew that either the two big neighbors could be great support or could terribly threats to the Nepal's sovereignty.

Then, the Rana Regime seemed to be more inclined towards the British. The Ranas got support from the British to make them more powerful and to protect the nation from China. "Jung Bahadur was the first Prime Minister of Nepal who had visited the UK in 1850. He was aware that at that time British power had dominated

the whole region and China's power was declining. So, he adopted a British-India centric policy." (Rose, 1971, p. 106).

Nepal had a good relation with British Raj India so that Nepal could be protected from the foreign attacks. The supply of Nepalese youths in the British Gurkha Regiment helped Nepalese to be recognized as the Loyal and Brave Warriors, and a source of remittance as well as the introduction of different modern trends of development to Nepal. The establishments of Missionary schools like St. Xavier's in Nepal helped to uplift the academic status of Nepal. Nepalese youths got the chance to explore the world and practice better living practices here in Nepal. Ram Prasad Rai himself thought of fighting against Ranas when he was in the British Indian army, highly impressed by Indians fighting for their freedom from the British Raj. In 1975, King Birendra proposed Nepal as the zone of peace, 130 countries supported the proposal but India didn't. Then in 1990, the panchayat system was replaced by multi-partydemocracy. Thedemocratic forces of Nepal were fully supported by Indian political leaders.

In 2015, the constitution of Nepal was promulgated. "On the day that the fuel blockade began, "Indian Express' ' newspaper reported that India had demanded specific changes to the new Nepali constitution while the Indian government denied this claim. (Rawat,2015). Similarly, there are disputed areas like Kalapani and Limpiyadhura between Nepal and India, and are very hard to resolve due to the unavailability of old maps and documents. The agreements signed on water resources (like Gandaki and Koshi) do not seem to be advantageous to Nepal.

Nepal-India relations is often pronounced as the matrimonial relation of 'RotiBeti' because Nepalese people living in Terai region are dependent over Indian market for their daily life whereas cross border marital relations is in wider existence

between Nepal and India (Patel, 2017, p.76). Nepal has been receiving the aid in the form of concessional loan, grant aid, budget support, technical assistance, revenue mobilization by support in upgrading administration and others. Development programs like schools, campuses, health posts, hospitals, hydro projects, roads, bridges, rural drinking water projects are undergoing India's assistance.

Nepal India relation seems not to be vividly clear though India has been playing an important role in the development works of Nepal, as India has been invading the areas Nepal's border and the time after time economic blockade Nepal had faced. It is seen that India has sometimes interfered directly in Nepalese politics. The water diplomacy between India and Nepal is the absolute topic to be studied since it brings the clear picture of India's key interest in Nepal and its water resources, and Nepal's projected benefits or the ballooned development with an Indian air. The agreements made between Nepal and India regarding the water resources have to be analyzed. How the nations have been benefitted or burdened only? Despite the Arun III HEP seeming to be a development bringer, "What are its positive and negative impacts in the political economic aspects of the Nepal India relation due to the project?" is the vital issue to be studied. "Indian aids come to Nepal in a haphazard and unplanned way without much homework for fulfilling Nepal's larger development needs but they are centralized to mark the visit of high-level dignitaries and as gifts in the special days of India." (Jaiswal ,2016, pp.93-94)

India has been the largest trading partner of Nepal and there has been a substantial increase in the volume of bilateral trade over the years between the two countries. Over 552 large, intermediate and small-scale projects have been implemented across Nepal at an estimated cost of more than 77 billion Nepalese

rupees with Indian assistance since 1951. Moreover, the social, religious and cultural ties between the two countries and their peoples have existed since time immemorial.

Water management between Nepal and India is a critical aspect of their bilateral relations, heavily influenced by the shared river systems that traverse their borders. These transboundary rivers, including the Ganges, Koshi, Gandaki, and Mahakali, are vital for agriculture, hydropower, and flood control in both countries. This review examines the historical context, key agreements, and contemporary political challenges in managing these shared water resources, drawing on empirical evidence and scholarly analysis.

The Koshi Agreement (1954, revised 1966): The Koshi Agreement aimed to construct a barrage on the Koshi River to control floods and generate hydropower. While it provided significant irrigation benefits to India, it faced criticism in Nepal for insufficient compensation and adverse social and environmental impacts (Pun, 2009).

The Gandak Agreement (1959): This agreement facilitated the construction of the Gandak Barrage, benefiting India's irrigation needs but raising concerns in Nepal about waterlogging and inadequate compensation for displaced communities (Gyawali, 2001).

The Mahakali Treaty (1996): The Mahakali Treaty, centered on the integrated development of the Mahakali River, including the Pancheshwar Multipurpose Project, was seen as a more balanced agreement. However, its implementation has been delayed due to technical disputes and political disagreements (Dhungel & Pun, 2009).

Frequent monsoon floods cause significant damage in both countries, necessitating improved bilateral coordination. While there have been joint efforts in flood forecasting, the need for more effective disaster response mechanisms remains

critical (Shrestha, 2016). Political sensitivities often hinder the timely exchange of information and resources. Nepal's vast hydropower potential is of strategic interest to India. Projects such as Arun-III and Upper Karnali highlight the benefits of cooperation but also underline issues like fair compensation, environmental impacts, and local community involvement. Political resistance in Nepal, driven by perceptions of unequal benefit distribution, complicates these projects (Rai, 2019). Climate change poses new challenges for water management, affecting river flows and increasing the frequency of extreme weather events. Both countries need to adopt adaptive management strategies, but political disagreements often impede the formulation of cohesive policies (Pandey, 2020).

Ensuring equitable water sharing is a persistent challenge. Historical agreements have often been perceived as favoring India, leading to calls for more transparent and fair negotiation processes that better address Nepal's concerns (Upreti, 2006). Political dynamics within Nepal, including regional and local power struggles, further complicate these negotiations.

Empirical studies have shown that the Koshi Barrage has led to significant socio-economic disruptions in Nepal, including displacement and loss of livelihoods (Gautam, 2008). The lack of adequate compensation and rehabilitation measures has fueled political discontent. Research indicates that while the Gandak Project has provided irrigation benefits to India, it has caused waterlogging and other environmental issues in Nepal (Shrestha, 2004). The political fallout from these adverse impacts continues to affect bilateral relations. The Pancheshwar project, under the Mahakali Treaty, is a prime example of the political challenges in transboundary water management. Disputes over cost-sharing, benefit distribution,

and environmental assessments have stalled the project for decades (Dhungel & Pun, 2009).

Nepal-India water management is a complex interplay of technical, environmental, and political factors. Historical agreements and contemporary projects highlight both the potential for cooperation and the challenges posed by political sensitivities and perceived inequities. Addressing these challenges requires enhanced bilateral mechanisms, inclusive negotiations, and integrated management strategies. As climate change exacerbates water management issues, both countries must work together to ensure sustainable and equitable use of their shared water resources.

2.2.1 Nepal India Political Relations

Even before Nepal was unified, it had political contacts with India. The Licchhavi monarchs, who are claimed to have come from India to Nepal about 250 ADS, played an essential role in strengthening Nepal-India relations. Similarly, Malla monarchs expanded their contacts with India during their reign. After Nepal's unification, the creator of modern Nepal, Prithivi Narayan Shah, described Nepal as 'a yam between two stones' and pursued an equidistance policy with India and China to defend Nepal's independence. The Sugauli Treaty, reached following Nepal's loss in the Anglo-Nepal War (1814-1816), led to reliance on British India and a decline in ties with Tibet (Baral, 2016).

Nepal lost one-third of its land to British India as a result of the treaty, and Article 7 of the Sugauli Treaty banned Nepal from maintaining connections with other European and American nations without the British government's agreement (Malla, 1983). The pact allowed Britain and India to pursue diplomatic interests during the Rana government. Although British India recognized Nepal as a sovereign state through a peace and friendship treaty in 1923, Kathmandu had to confer with British

India on its ties with neighboring states such as Bhutan, Sikkim, Tibet, and China (Adhikari, 2018) After gaining independence in the late 1940s, India revived a "Treaty of Peace and Friendship" in 1950, establishing a fresh diplomatic relationship to this day. The treaty is seen as the foundation for Nepal's Special ties with India, which include an open border. However, it is viewed as a problematic pact and has become a political issue in Nepal. The "treaty" and the "Letter of exchange "formed the essential foundation for Nepal's ambitions, primarily in terms of security and commercial connections (Khatri,2001).

While the anti-Rana movement was expanding using Indian soil, India committed Ranas to support them to sustain their regime if a new Peace and Friendship treaty can be signed but the Rana regime collapsed in less than one year after signing the treaty (Mishra, 2004).According to Article 7 of the "Nepal-India Treaty of Peace and Friendship, 1950," the governments of India and Nepal commit to provide citizens privileges in terms of residence, property ownership, participation in trade and commerce, and mobility in other countries' territories. It has major implications for Nepal since it might generate an unfair and disproportionate impact (Shrestha, 2003)

Indian hands were always there in every political shift, including the Maoist insurgency that occurred between 1947 and 2003, taking advantage of Nepal's topography (Mishra, 2004). In order to put pressure on the Rana administration, King Tribhuvan's family escaped to Delhi in 1950 with the assistance of India. The 'Delhi Compromise', a tripartite agreement between Ranas, Nepali Congress, and the King, marked the end of the Rana regime and the start of a democratic era in Nepal. The three parties were unable to interact directly and instead relied on Indian Prime Minister Jawaharlal Nehru (Sharma, 1998, p.176). According to Nepal's democratic

government relied heavily on Delhi for guidance on political, administrative, security, and foreign affairs problems (Mishra ,2004, p. 631). While addressing India's parliament in 1950, Nehru said: "From time immemorial, the Himalayas have provided us with magnificent frontiers, we cannot allow anything to go wrong in Nepal or permit that barrier to be crossed or weakened, because that would be a risk to our own security" (Baral, 2015).

In the 1960s, King Mahendra sought to neutralize special links with India by diversifying assistance, trade, and foreign relations, recognizing that they restricted Nepal's independence and threatened national sovereignty (Dahal, 2011, p. 40). Mahendra aimed to eliminate vulnerability owing to over-reliance on a single power. Nepal remained neutral during the Sino-Indian border conflict in 1962. King Mahendra also consented to build the Kathmandu-Kodari Road, which was finished in 1965 with Chinese aid. Along with unequal treaties, Nepal and India's open and easily accessible border promoted political, cultural, and economic contacts, allowing India to become one of Nepal's most prominent foreign players. Nepal, threatened by India's acquisition of neighboring Sikkim, proposed the 'Zone of Peace' (ZOP) in 1975. India saw King Birendra's proclamation of ZOP as an attempt to damage India's strategic and security interests, and rejected the idea (Khan, 2016, p. 165). The treaty would also replace the old treaties like the tripartite treaty of 1947 and peace and friendship treaty of 1950 as well as prevent both India and China to engage Nepal in any future wars between them (Malla, 1983, p. 78).

In 1987, Nepal implemented a work permit requirement for Indian laborers. In 1989, India established a blockade on Nepal after it acquired armaments from China, blocking 13 out of 15 border transit points (Garver, 1992, p. 77). India also refused to renew the Indo-Nepal trade and transit treaty which expired in 1988. In the early

1990s, over one lakh Bhutanese refugees entered Nepal, causing significant problems. India offered a path through Assam for Bhutanese to access Nepal (Ikram, 2005, p.110). Bhutan's foreign relations are dictated by India's bilateral treaty of 1949. However, the Indian government declined Nepal's plea for assistance in settling the Bhutanese refugee situation (Ikram,2005, p.113). Communist Party of Nepal raised voice against Indian interference and put forward the agenda to cancel unequal treaties with India during election season in Nepal (Mishra, 2004). n Communist party of Nepal, Maoist started a 10 years insurgency in Nepal in 1996, they presented 40 points demanded to the government where they stated India as 'hegemonic' and 'regional imperialist' (Subedi, 2016, p.34). The Indian Government declared Communist Party of Nepal (Maoist) as a terrorist organization and some of the key leaders of Maoist were arrested in India. However, CPN (Maoist) used Indian Territory to regroup and retreat in insurgency which is the reason for their rapid success (Mishra, 2004, pp. 634-642).

India's interference in Nepal's internal decision-making ranging from the 12-points agreement signed in Delhi to the process of drafting a new constitution. India took initiative to organize a meeting between Maoist leaders and Nepal's major political parties' leaders in 2005 and a 12 points agreement was signed between Seven Parties Alliance (SPA) and CPN (Maoist) in New Delhi. (Khanal,2016) This resulted in the 'Peoples' movement II' in Nepal that led to the downfall of the monarchy in 2008. From 2005 to the Indian PM Modi's visit to Nepal in 2014, India dealt with Nepal with no political contact but only with its bureaucracy and intelligence (Subedi, 2016, p.35). Modi's speech during the visits become more popular and helps to decrease anti-Indian thought. He also showed interest to revise the 1950 Treaty of Peace and Friendship and agreed to form Eminent Persons' Group (EPG) which was

mandated to review the 1950 Treaty (Subedi, 2016, pp. 36). EPG prepared a single joint report and submitted it to their respective governments.

There are border disputes between Nepal and India in 21 districts of Nepal which covers more than 60000 hectares of land with major disputes in Kalapani, Lipulekh, Susta, Limpiyadhura, Tanakpur, etc. (Poudyal, 2014, p.34). Many of the border pillars have been either removed or misplaced from the Indian side (p.34). Border encroachment issues have been reported by journalists and Nepali leaders also visited the disputed area. India Nepal relations became more complicated when both countries published their cartographic map including disputed land in 2020.

Nepal suffered from an undeclared economic blockade in 2015 when the Constitution Assembly passed a new constitution by majority. India cut the supply of medicine, fuel and other commodities in Nepal. More than 90 percent of Constitution Assembly members voted in favor of the new constitution but some socio- political groups, mainly the Madhesh centric party, protested against a few points of the new constitution (Pant, 2018, p.24). Some days before promulgation of new constitution, Indian foreign secretary, S. Jaishankar visited Nepal and tried to give pressure to postpone the promulgation of constitution which was ignored by Nepali leaders and that resulted in blockade (Karki and K.C., 2020). Experts consider the blockade as the violation of many international laws and conventions like the Vienna convention of 1965, UN convention of law of the sea of 1973, SAFTA agreement, etc. which guarantees transit rights of landlocked countries. Nepali people perceive those treaties like 1950 Treaty of peace and friendship, Kosi treaty, Mahakali treaty, Gandak treaty are not equally beneficial but only fulfill India's vested interests of India.(Karki and K.C., 2020, p.88)

2.2.2 Nepal India Political-Economic Relation

Though the people-to-people contact between Nepal and India is centuries old, the formal bilateral relations was marked on 31 July 1950 with the signing of the Treaty of Peace and Friendship. India is one of the major trading partners of Nepal. As per the central bank's report, Nepal exports to India stood at 53.3 percent of total exports in the first five months of the ongoing fiscal year (2017-18). It was 55.6 percent in the corresponding period of the previous fiscal. Nepal has exported goods worth Rs 17.96 billion to India in this period. India's major export to Nepal includes petroleum, coal products; chemical, rubber, plastic; ferrous metals; machinery and equipment; mineral products; textiles; transport equipment; food products; motor vehicles and parts; and metals. Its major imports from Nepal include textiles; ferrous metals; chemical, rubber, plastic; crops; beverages and tobacco product; metals; vegetables, fruits, nuts; food products; minerals; and leather products. India is also major source of Foreign Direct Investment to Nepal accounted for approximately 36% of the total FDI in Nepal. India is also source of remittance for Nepal.

2.2.3 Indian Aid to Nepal

Nepal is a major receiver of international aid from India. The country has received help in several forms, including concessional loans, grants, budget support, technical assistance, and revenue mobilization through administrative upgrades. India has been providing aid for development projects such as schools, campuses, health posts, hospitals, hydro projects, roads, bridges, and rural drinking water. Nepal is the fifth-largest recipient of Indian aid in South Asia.

India initially sent help to Nepal in 1954 through the Indian help Mission. India funded the construction of the Tribhuvan Highway, the first road connecting Kathmandu and Terai. India has supported several projects in Nepal, including the Koshi Barrage, Bir Hospital, Janakpur Railway, Mahendra Highway, Devighat

Hydropower, Tribhuvan University, and B.P. Koirala Institute of Health Sciences (BPKIHS) (Embassy of India, 2008). Since the 1980s, India has provided help through its Economic Cooperation Wing of the Embassy of India.

India has undertaken numerous river training and flood protection projects along the major rivers that flow from Nepal into India, such as the Gandak, Kosi, and Mahakali rivers. These projects are crucial in managing floods and ensuring sustainable water management in the border regions.

Under the Gandak and Kosi Agreements, India has constructed and maintained infrastructure such as barrages, canals, and embankments. The Kosi Barrage and the associated flood management structures are prominent examples, aiming to control floods and provide irrigation benefits to both countries. India has been involved in developing hydropower projects in Nepal, such as the Pancheshwar Multipurpose Project and the Project. These projects not only enhance water management but also contribute to energy production and economic development in Nepal. India has funded several Small Development Projects in Nepal, which include the construction and renovation of water supply systems, irrigation channels, and rural drinking water projects. These initiatives aim to improve local water management and provide access to clean drinking water.

India has also focused on capacity building and training programs for Nepalese professionals in water resource management. These programs help enhance the technical skills and knowledge of Nepalese engineers and officials, facilitating better water management practices. India has provided significant aid to Nepal in the water management sector, focusing on various aspects of water resources, flood management, and hydropower development. Here are some of the key initiatives and projects: In 2023, India and Nepal signed an agreement for the export of 10,000 MW

of hydroelectric power from Nepal to India over the next decade. This deal includes the development of infrastructure to facilitate power trade, aiming to boost Nepal's energy export capabilities and assist India in transitioning to renewable energy source.

The two countries have inaugurated three cross-border transmission lines to support the trade of electricity, enhancing the connectivity and efficiency of power distribution between them.

India and Nepal collaborate on managing floods in shared river basins. These efforts include building and maintaining infrastructures like dykes, reservoirs, and embankments. The focus is on reducing flood risks, improving community resilience, and ensuring sustainable water resource management. India has increased its grant assistance for high-impact community development projects in Nepal, which includes various water management initiatives. These projects are aimed at improving local infrastructure and disaster management capabilities.

Regular meetings of the Nepal-India Joint Commission address bilateral issues, including water resource management and flood control. These meetings facilitate ongoing dialogue and coordination on various projects and policies.

India provides technical support and capacity-building initiatives to enhance Nepal's ability to manage its water resources effectively. This includes training programs and sharing expertise in water management technologies. Through these collaborative efforts, India aims to support Nepal in harnessing its water resources for economic development while addressing environmental challenges and enhancing bilateral ties. These initiatives reflect the ongoing cooperation between India and Nepal in the water management sector, aiming to address common challenges and promote sustainable development in the region.

2.2.3.1 Indian Foreign Direct Investment (FDI) in Nepal

According to Nepal Rastra Bank (NRB), India's paid-up capital reached a record of NPR 41.47 billion, followed by China's NPR 26.81 billion (NRB, 2019, p.12). It is carrying out large projects such as hydro, which is worth 900 MW and costs around USD 1.6 billion, which is regarded as crucial for Nepal. India's investments comprised 6% in agro-forestry, 1% in construction, insignificant in information technology and minerals, 34% in services, 30% in tourism, and 25% in manufacturing. Aside from commerce, FDI penetration demonstrates India's supremacy in funding Nepalese projects (NRB, 2019).

More than 150 ventures are operating in all over Nepal having ownership in various sectors. Asian Paints (Nepal) Pvt. Ltd, Berger Jenson & Nicholson (Nepal) Pvt. Ltd, Nepal SBI Bank Ltd, Everest Bank Ltd, Surya Nepal Private Limited are some of the major joint ventures that have larger market share of Indian investors (NRB, 2019). Nepal India Treaty of 1950 provided special preferences to Indian Government and private firms to engage in economic matter due to which investment of Indian ventures increased in Nepal after Nepal adopting liberal economic policy in 1990s.

Table 1: Year-Wise Total FDI, Indian FDI, Number of Employment and Share of IFDI

FY	Total FDI	Indian FDI	No of Employment by IFDI	Share of IFDI (percent)
1989/90	898.51	70.4	6039	7.83
1990/91	406.28	26	1501	6.40
1991/92	597.84	289	3303	48.34
1992/93	3083.67	1362.5	4045	44.18
1993/94	1378.76	444	2298	32.20
1994/95	477.59	115	761	24.07
1995/96	2219.86	235	1585	11.00
1996/97	2395.54	1508	3570	62.95
1997/98	2000.28	180	694	9.00
1998/99	1671.22	724	1361	43.32
1999/00	1417.61	243	1628	17.14
2000/01	3102.56	1282	2524	41.32
2001/02	1206.95	678	1452	56.17
2002/03	1765.33	505	1065	28.60
2003/04	2764.8	1696	1560	61.35
2004/05	1635.77	1167	3125	71.35
2005/06	2606.39	1563	3020	59.96
2006/07	3226.79	2167	1908	67.15
2007/08	9812.6	4555	3187	46.41
2008/09	6255.09	2500	2105	39.96
2009/10	9100	3994	1835	43.90
2010/11	10050.71	7007	3274	69.71
2011/12	7140.81	2298	1754	32.20
2012/13	19936.23	2691	3471	13.50
2013/14	20107.42	6451	2108	32.08

(Department of Industry, n.d., as cited in Adhikari and Baral, 2015)

According to the percentage of Indian FDI in Nepal's total FDI was just 6.40 percent in 1990/91, but climbed to 71.35 percent in FY 2004/5. Again, Indian FDI fell to 13.50 percent in FY 2012/13. Since 2014, Chinese investment has eclipsed Indian FDI, and it is now three times larger in terms of both projects and money. In the 2017

Nepal investment conference, Indian businesses contributed 317 million dollars, while Chinese firms committed 8.36 billion out of 13.52 billion overall investment promises (Jha, 2020). Nepal must likewise exercise caution when it comes to FDI because it may be both beneficial and detrimental. If FDI is allowed without adequately examining the terms, conditions, and transparency elements of the project, the country may slip into a debt trap or suffer unwanted involvement in the country's internal decision-making process. (Jha,2020)

2.2.4 Historical Development of Hydroelectricity in Nepal

Hydropower sector was liberalized under the policy formulated in 1992. As the on-site activity to implement private sector projects only started in 1996 and first power project (Khimti) was commissioned in July 2000, during 9th Five-year plan. In this backdrop, an evaluation of each such plan period will help to compile a score-card of the policy heralding private investment in the sector and also help gauge the success or failure of each such plan as well as to diagnose problems and suggest improvement measures. (Shrestha,2015)

- **Eighth Five Year Plan: It** was in the first year of 8th Five Year Plan, for the period 1992-1997 that Hydropower Development Policy, 1992 and Electricity Act, 1992 were promulgated to allow private sector entry into hydropower sector. The target set for this period was 29.7 MW and the following projects. (Shrestha,2015)
- **Tenth Five Year Plan:** Tenth five-year plan, covering the period of 2002-2007, had aimed to add 314.6 MW installed capacity. NEA was expected to complete 70 MW Middle Marshyangdi and 30 MW Chamelia projects, totaling 100 MW. The private sector was expected to complete an assortment of projects totaling 214.6 MW. Compared to the ninth plan, the achievement

of the tenth plan was very dismal as NEA failed to add a single MW20, while the private sector succeeded to add only 33.93 MW by completing following projects: Only 10.78% of the target was achieved during this period. (Shrestha,2015)

- **First Interim Three-YearPlan**: A target of 105 MW was fixed for the first interim 3-year plan (2007-10), of which NEA completed the Middle Marshyangdi Project, 70 MW. Private sector completed the following projects during the period. In this manner, 82 MW was added to the system against a target of 105 MW which is a significant achievement; 78 percent. However, Middle Marshyangdi was supposed to be commissioned in the previous plan period - specifically 2004. (Shrestha,2015)
- **Second Interim Three Year Plan**: A target of 281 MW was set for 2nd three-year interim plan spanning from 2010 to 2013. However, only an isolated mini hydro project 400 kW Gamgad (in Mugu district) was completed by NEA. On its part, private sector completed following projects totaling 49.863 MW: Following projects were upgraded in this plan period by the private sector to add 6.42 MW capacity as follows: Similarly, NEA signed Supplementary PPA for additional power of 9 MW21 with Upper Bhote Koshi Project Company on July 8, 2012 at Rs 1.625/kWh22, thereby adding 9 MW to the system. Against a target of 281 MW for the 2nd Interim Plan, only 65.683 MW was added to the system - an achievement of meager 23%. (Shrestha,2015)
- **Third Interim Three-Year Plan:** It was targeted to add 668 MW in the system during this plan period, 2013 to 2016. However, NEA commissioned no project in the first year of 3rd Interim Three-Year Plan (FY 2013/14) while

following projects were commissioned by private sector in FY 2013/14. (Shrestha,2015)

2.4 Policy Review

2.3.1 Water Related Policies

According to the Hydropower Development Policy, 2001 (HPDP, 2001), based on experiences gained in the course of implementing the principles followed by the Hydropower Development Policy 1992, emerging new concepts in the international market and their impacts, technological development, possibility of exporting electricity, and foreign investment and commitment on the environmental protection, the Hydropower Development Policy, 2001 (B.S. 2058) was introduced with a view to make clear, transparent and investment-friendly hydropower development in Nepal The objective of Hydropower Policy, 2001, which guides the hydroelectric development in the country, is to produce clean energy through the development of hydroelectric projects, which could also assist in environmental conservation. One of the policies is to utilize indigenous labor and skill in hydropower projects. It emphasizes extending the use of electricity in rural areas to reduce fuel wood consumption Clause 6 of the policy refers to the arrangements of compensation, land acquisition and resettlement of displaced families. Provision of water rights has also been mentioned in sub-clause 6.2.

According to the " Water Resources Regulation, 1993 (WRR, 1993)", It is mandatory under Rule 17(e) of the regulation that any person or corporate body, who desires to obtain a license for utilization of water resources must state in his application that appropriate measures will be taken to lessen the adverse effects due to the project on the overall environment. Measures are to be taken for the conservation

of aquatic life and water environment, and for mitigating social and economic effects of the project in the concerned area. Local labor should be utilized and the local people should get benefits after the completion of the project. The regulation also emphasizes training to the local people in relation to construction, maintenance and operation of the project. The mitigation plan should give details of people to be evacuated and a necessary plan for their rehabilitation Rule 19 stipulates that the water resources committee shall publish a notice giving detail information about the project to the people. If any person found that the construction and operation of concerned project is likely to cause adverse effects, he or she may furnish his/her reaction stating the reason within the thirty-five days from the date of publication of the notice. If the committee is satisfied with the reason given by the people, the proponent will be asked to revise the plan.

2.3.2 Foreign Policy

Foreign policy is one of the wheels with which the process of international politics operates. Foreign policy is not separate from the national policy, instead it is a part of it. It consists of national interests that are to be furthered in relation to other states. Almost all the states determine the course of their foreign policies within the limits of their strengths and the realities of the external environment. The nonpolitical relations also fall in the scope of foreign policy.

According to Joseph Frankel, Foreign policy “consists of decisions and actions which involve to some appreciable extent relations between one state and others". According to Hugh Gibson, Foreign policy is “a well-rounded, comprehensive plan, based on knowledge and experience, for conducting the business of government with the rest of the world. It is aimed at promoting and protecting the interests of the nation. This calls for a clear understanding of what, whose interests are and how far

we can help to go with the means at our disposal. Anything less than this falls short of being a national foreign policy".

The foreign policy is the sum total of the principles, the interests and objectives which a state formulates in conducting its relations with other states. Foreign Policy consists of self-interest strategies chosen by the state to safeguard its national interests and to achieve its goals within the international relations milieu. It is the plan of action adopted by a nation with regards to its diplomatic dealings with other countries.

2.3.2.1 Foreign Policy of Nepal

Every nation has its own foreign policy. Foreign Policy determines the state of relationships between countries and guides the diplomatic negotiations. In this digital world, the theory of isolation does not exist at all. System theory in International Relations states that the world as a system, where the sovereign states are the parts of the global system. Each and every country maintains relations with the others to protect their sovereignty.

According to MOFA, Nepal, guiding principles and norms of Nepal's foreign policy are

- Nepal's independence, sovereignty, territorial integrity, freedom; protection of national interest, and promotion of national respect and dignity
- Sovereign equality
- Panchasheel (the five principles of peaceful coexistence)
- Spirit of the Charter of the United Nations
- Non-alignment
- Mutual respect and benefit
- International Law and norms world peace

- Peaceful settlement of disputes
- International cooperation and rule of law
- Economic progress and prosperity
- Ecological balance, human security and conservation of the planet

"The State shall direct its international relations towards enhancing the dignity of the nation in the world community by maintaining international relations on the basis of sovereign equality, while safeguarding the freedom, sovereignty, territorial integrity and independence and national interest of Nepal." (Ch. 4, Article 50(4), Constitution of Nepal, 2015)

Objective of Nepal's Foreign Policy The fundamental objective of Nepal's foreign policy is to enhance the dignity of the nation by safeguarding sovereignty, territorial integrity, independence, and promoting economic wellbeing and prosperity of Nepal. It is also aimed at contributing to global peace, harmony and security. Guiding Principles of Nepal's Foreign Policy,the foreign policy of Nepal is guided by the abiding faith in the United Nations and policy of nonalignment. The basic principles guiding the foreign policy of the country include:

1. Mutual respect for each other's territorial integrity and sovereignty;
2. Non-interference in each other's internal affairs;
3. Respect for mutual equality;
4. Non-aggression and the peaceful settlement of disputes;
5. Cooperation for mutual benefit;
6. Abiding faith in the Charter of the United Nations;
7. Value of world peace.

2.3.3 Provisions of the Constitution of Nepal on National Interest and Foreign Policy

National Interest (Article 5.1)

Safeguarding of the freedom, sovereignty, territorial integrity, nationality, independence and dignity of Nepal, the rights of the Nepalese people, border security, economic wellbeing and prosperity shall be the basic elements of the national interest of Nepal.

Directive Principles (Article 50.4)

The State shall direct its international relations towards enhancing the dignity of the nation in the world community by maintaining international relations on the basis of sovereign equality, while safeguarding the freedom, sovereignty, territorial integrity and independence and national interest of Nepal.

State Policy (Article 51)

1. To conduct an independent foreign policy based on the Charter of the United Nations, non-alignment, principles of Panchasheel, international law and the norms of world peace, taking into consideration of the overall interest of the nation, while remaining active in safeguarding the sovereignty, territorial integrity, independence and national interest of Nepal.
2. To review treaties concluded in the past, and make treaties, agreements based on equality and mutual interest.

2.3.4 Nepal India Peace Treaty

Excerpts of the Treaty have been mentioned here that might relate with the Nepal India Water Relations.

Article 5

The Government of Nepal shall be free to import, from or through the territory of India, arms, ammunition or warlike material and equipment necessary for the security of Nepal. The procedure for giving effect to this arrangement shall be worked out by the two Governments acting in consultation.

Article 6

Each Government undertakes, in token of the neighborly friendship between India and Nepal, to give to the nationals of the other, in its territory, national treatment with regard to participation in industrial and economic development of such territory and to the grant of concessions and contracts relating to such development.

Article 7

The Governments of India and Nepal agree to grant, on reciprocal basis, to the nationals of one country in the territories of the other the same privileges in the matter of residence, ownership of property, participation in trade and commerce, movement and other privileges of a similar nature.

2.4 Conceptual Framework

The theoretical foundation and conceptual framework of the study is as follow:

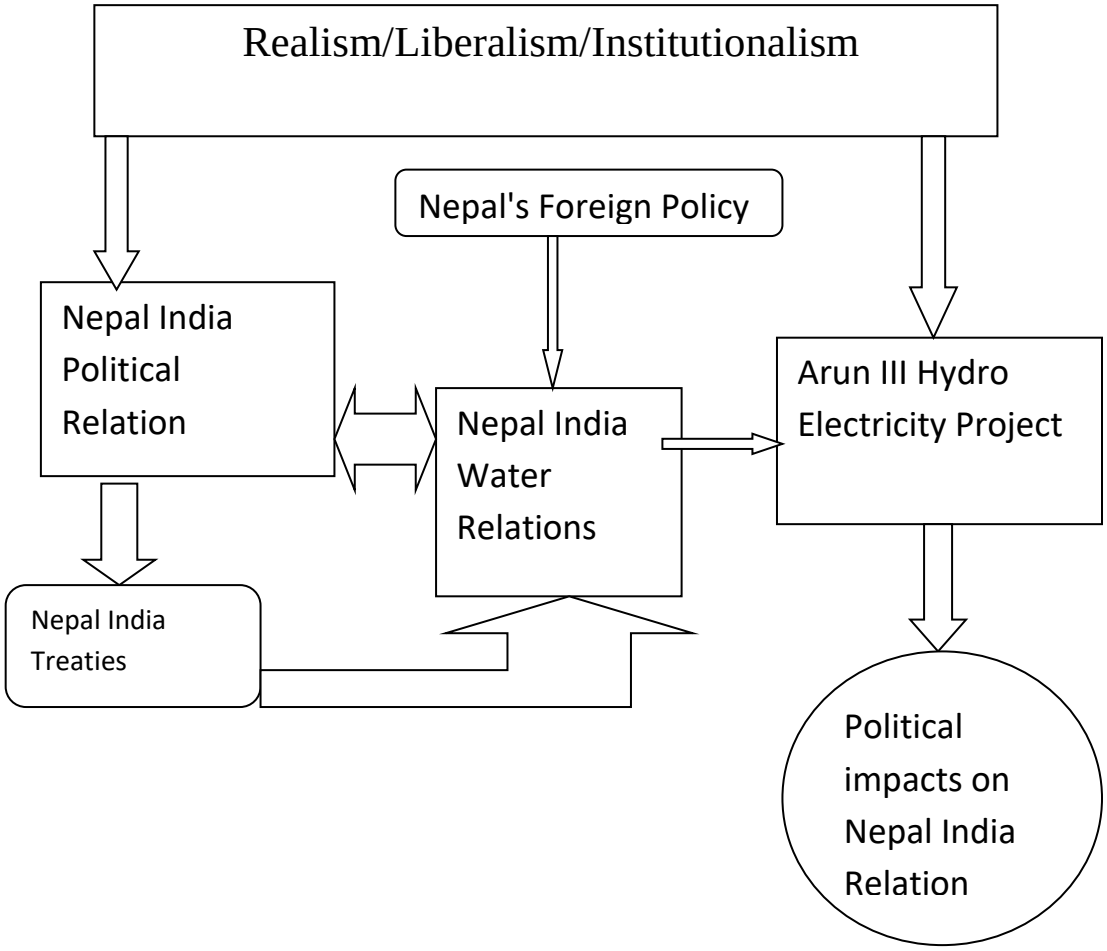

Figure 1: Conceptual Framework

2.5 Research Gaps

Several researchers have paved a foundation for the research on a topic of Nepal India Water Relations. Unfortunately, it is still inadequate. Nepal and India have a long relationship but the water politics between these nations have not been studied properly. The policies of Water diplomacy between Nepal and India are unclear. The insights of Arun III HEP have not been explored to its optimum yet. Research on the Hydro Electricity Project has been conducted by various researchers and organizations. Some of the researchers and their findings have become a paved a path for the other researchers.

Dr. Ram Sharan Mahat (Tribhuvan University) has focused on "Economic and social impacts of the Arun III Hydropower Project" concluding that the project is expected to significantly boost local economies through job creation and infrastructure development whereas the challenges include managing the displacement of local communities and ensuring fair compensation.

Similarly, Dr. Sunita Basnet (Kathmandu University) has done research on " Environmental impact assessment and biodiversity conservation" concluding that the project poses risks to local ecosystems, particularly in terms of habitat disruption for aquatic and terrestrial species. Mitigation strategies such as creating wildlife corridors and continuous environmental monitoring are essential.

Prof. Bishnu P. Bhattarai (Institute of Engineering, Tribhuvan University) has conducted research on " Technical feasibility and engineering challenges “stating that the engineering design of Arun III is robust, but continuous innovation and adoption of new technologies are required to maintain efficiency. Sediment management and the maintenance of transmission lines are critical technical challenges that need ongoing attention.

Research title of Dr. Ramesh Kumar Pandey (World Bank Consultant) is "Policy and governance in large-scale hydropower projects". He has concluded that the strengthening regulatory frameworks and ensuring transparency in governance are crucial for the project’s long-term success. Effective stakeholder engagement, including local communities and environmental groups, is necessary to address concerns and ensure sustainable development. The researches done before do not include the latest data. Most of the researches done before have not fully detailed the Nepal India Water Relations. To address this gap, this study is helpful.

CHAPTER III

RESEARCH METHODOLOGY

Chapter Three of this research paper titled "Research Methodology" outlines the approach and methods used to conduct the research. This chapter provides a detailed explanation of the research design, data collection techniques, and analysis procedures. It ensures that the research is systematic, replicable, and scientifically valid. This study uses a qualitative research design primarily. A thorough and qualitative research of the given problem has been conducted. The research has mostly employed primary and secondary data from government databases, academic journals, books, conference reports, articles, and various quotes from speeches and interviews. Aside from that, the study's legitimacy has been bolstered by a variety of written and broadcast interviews. For this study, definitions, concepts, and electronic and online media sources were largely used.

3.1 Research Design

This study used a qualitative approach to its research design. Qualitative research design has been chosen in this study to explore complex phenomena, understand context, and gather deep insights of Nepal India Water relation. Methods like interviews, Focus Group Discussions and Site observation have been done. FGD among the 7 people who had been working in Arun III HEP. A case study had been conducted on Arun III HEP. Similarly, 21 respondents had been interviewed.

3.2 Study Site Description

The study has been conducted among the Tumlingtar, Sankhuwasabha district, Nepal. The Hydroelectricity Project is situated in the Sankhuwasabha District of Province No. 1 in eastern Nepal. The specific geographic coordinates are

approximately 27.5°N latitude and 87.4°E longitude. The project harnesses the energy of the Arun River, one of the major tributaries of the Koshi River system. The project area is characterized by rugged and mountainous terrain. The altitude varies significantly, contributing to the high head needed for hydroelectric power generation. The region experiences a subtropical to temperate climate. Monsoon rains significantly impact the hydrology of the Arun River, with heavy precipitation during the monsoon season (June to September) and relatively dry conditions in winter. The Arun River has a substantial flow, which varies seasonally. The river's catchment area above the project site is extensive, collecting water from numerous smaller streams and tributaries. A large dam is constructed on the Arun River to create a reservoir. This dam is crucial for water storage and regulation.

The powerhouse is located downstream of the dam. It houses the turbines and generators that convert the river's kinetic energy into electrical energy. The project includes a network of tunnels and penstocks that channel water from the reservoir to the powerhouse. High-voltage transmission lines are installed to transport electricity from the project area is rich in biodiversity, with various plant and animal species. Efforts are made to mitigate the impact on local ecosystems, including the implementation of environmental management plans. There are no major protected areas within the immediate vicinity of the project site, but environmental assessments are conducted to ensure minimal disruption to wildlife habitats.

3.3 Data Collection Tools

The tools to collect the data were structured interviews, occasional observation, focus group discussions and open-end questionnaires. An interview had been taken of Mr. Vipul Thakur, the then HR manager of the project. Focused Group discussions had been done among the Nepalese individuals working in the projectso that participants can provide context to their responses, offering a deeper

understanding of the Arun III HEP. Open Ended Questionnaires had been requested to fill up by the local people of the subjected area.

3.4 Study Data

The data collected during the study are as the following. Verbal data such as interview transcripts, focus group transcripts, field notes and diaries. Similarly, the visual study data like photographs and videos have been collected of the project. Documentary data consulted during the research are textual documents and media contents related to the research. Audio recordings have been collected. Anecdotes made by the individuals have helped in the research.

3.5 Data Sources

3.5.1 The Primary Sources

Structured Interviews: The primary source of data has been the interviewing of the concerned authority.

Questionnaire: The data have been collected through open ended questionnaires. Considering the research matter, the questions are open-ended and subjective. Selection of individuals in the interviews and questionnaires has been made to ask the concerned individuals with the.

Interaction and focused group discussions: Interactions with Governmental and non-governmental officials, intellectual and political science, international relations and strategic related foreign policy experts have been used as primary source data for the study. FGD was conducted among the working staff of the project.

3.5.2 Secondary Sources

The secondary data have been derived from published and unpublished books, and published Ph.D. Dissertations, Degree Thesis, magazines, journals, reports, seminar, presentations, articles and documents of Foreign Strategic Level journals,

magazine and newspapers. The information available in the web sites have also been used in the course of analysis.

Documents: Documents of different conventions such as Vienna Convention, Text of different treaties of British -India, government of India and Nepal, etc.

3.6 Methods of Data Analysis

The entire process of data analysis done in this research can be explained as below. The textual, verbal, visual and experiential data have been explored in order to analyses the data.

First of all, the data have been transcribed. By re reading the data sources, key ideas and recurring themes have been enlisted. Then the initial codes had been generated from the data. Key themes were refined from the codes. Overarching themes or patterns that emerge from the coded data, focusing on significant concepts, ideas, or experiences were identified. Then the themes were organized conceptually, reflecting the relationships between different elements of the data. Each theme was defined and described in detail, supported by illustrative quotes or examples from the data.

After then data were evaluated in the context of the research topic, literature, and theoretical frameworks, investigated the meanings and consequences of the highlighted themes, taking into account the viewpoints of the participants as well as the social, cultural, and historical background. Themes were compared and contrasted from various populations, situations, or historical periods to uncover parallels, contrasts, or patterns of variation and confirmed their findings with participants to guarantee accuracy and reliability, and sought comments on theme interpretation. The findings were shared with colleagues to get new viewpoints and improve the rigor and credibility of the analysis. The findings were presented in a narrative way, giving a full explanation of the discovered themes with supporting evidence.

CHAPTER IV

NEPAL INDIA RELATION REGARDING WATER MANAGEMENT

Nepal has abundant water resources, including approximately 6,000 rivers and rivulets. These rivers and rivulets provide up to 237 billion cubic meters of average yearly renewable water. Nepal has the ability to create 83,000 megawatts of hydropower. More than 50% of this potential is economically viable. Nepal's hydropower projects began in 1911 with the 500 KWP Harping Project. Despite having a long history of hydropower generating, Nepal continues to experience daily load-shedding and relies on energy imports from India. At the same time, Nepal has failed to establish irrigation networks to produce adequate food grains for its people. The Indian plains rely only on Nepalese rivers for irrigation. For this, India needs an uninterrupted flow of water from Nepal. Nepal lacks financial resources and technical skills to establish large-scale hydroelectric plants. India is, and may be, a viable source of finance for such initiatives. Nepal's water resources have significant potential for development, benefiting both the country and its people.

The link between Nepal and India, particularly in terms of water resources, occurs at both the individual and official levels. People-to-people relationships are built on pilgrimages along the Ganga, the Hindu Holy River, and its branching rivers in India and Nepal, while formal involvement began during British rule. In 1874, British India sent a letter to the Government of Nepal (GoN) regarding three ponds on the international border in present-day Kapilvastu officially launching the two nations' official relations (Dhungel, 2009). Since then, starting in 1920, the two neighbors have entered into a number of accords and treaties with the exchange of letters to build the Sarada Barrage on the Mahakali River. Similarly, After the independence of

India in 1947, the Government of India played a significant role in establishing and managing water-sharing agreements with neighboring countries, including Nepal such as 1954 Kosi Agreement, the 1959 Gandak Agreement , the 1991 Tanakpur MoU, and the 1996 Mahakali Treaty.

Nepal has experienced instability in politics during 1990s, resulting in corruption and opportunism within the short period by particular greed at at the price of long-term objectives. Political instability made it unlikely that complicated and time-consuming changes will be launched or implemented. Nepal was then in the process of developing a new constitution, which transformed the nation into a Federal Democratic Republic. It was believed that there would be politics related ambiguity over owning of the projects by the new federal government.

Development in Hydro electricity is inextricably linked with the Indian connection, particularly for projects focused on exports. India may be the only nation that works with Nepal on water-related projects such as energy, irrigation, control of flood, and measures. However, the relation with India in terms of sharing hydro resources has not been always straightforward. The major events regarding Nepal India Water Management have been listed below.

1. In Nepal, the 1950 Treaty of Peace and Friendship, the 1954 Koshi River Agreement, and the 1959 Gandak River Agreement are all highly disputed.
2. It is also believed that India is antagonistic towards these three unplanned barrages: the Girijapur barrage on the Karnali river, the Tanakpur barrage on the Mahakali river, and the Laxmanpur barrage on the Rapti river.
3. The Pancheshwar Project has been inactive for the past 13 years, and the 1996 Nepal–India Power Trade Agreement, which sought to import

electricity from India to Nepal for a medium period of five years and export it to India for a 25-year period, has also not moved forward because of this complex relations.

4. Mutual power cooperation between India and Nepal started in 1920. Initially, the GoI provided financial and technical help for the construction of the Kataiya power plant and the hydroelectric projects at Phewa, Trishuli, and Devighat in Nepal;
5. The 1 MW Pokhara hydropower project, which was started in 1968 with Indian assistance, laid the groundwork for later, more extensive energy cooperation between Nepal and India (Pandey, 1998). Subsequently, in 1969, 1979, and 1983, respectively, there were 22 MW plants in Trisuli, 15 MW plants in Gandak, and 14.2 MW plants in Devi Ghat.
6. India and Nepal signed a Power Purchase Agreement, although commerce at several locations, including the border, was insufficient and of lesser capacity. With many 11 and 33 kV linkages, border interchange programs and power services in Nepal and India enable access to energy to locations that are supplied from across the border.
7. The Power Trading Corporation (PTC) was chosen by the Indian government in July 2001 to serve as the supreme authority for handling matters pertaining to energy trade with Nepal. The only Indian agency that can cooperate with relevant Indian firms and complete practical and commercial actions with the NEA is PTC.
8. To increase the two-sided power trade, Nepal and India signed an energy trade agreement in October 2014 (Singh et al., 2015).Increased power supply

between Nepal and India is anticipated as a result of the completion of two dual-circuit transmission passages between Dhalkebar to Muzaffarpur (90 km) and Hetauda to Duhabi (300 km), both of which were partially funded by the World Bank. Additionally, research in western Nepal and the development of hydroelectric plants with a combined potential of 20,000 MW are also anticipated. The rising demand for energy in Nepal, which results in a net import of power from India, may be explained by the country's increased production potential. Currently, imports of power account for over 20% of all imports into the nation.

9. In 2016, India provided US$ 13.2 million in funding to build the first high-capacity cross-border power transmission lines, Dhalkebar in Nepal and Muzaffarpur in India, to improve electric current circulation.
10. Two new 133 kV cross-border transmission links were established in 2017 between Kusaha (Nepal) and Kataiya (India), Parwanipur (Napal) and Raxaul (India) were built with GoI funding assistance. There have been more than 20 transmission connections of 132, 33, and 11 kV, constructed for power exchange and trade in bordering zones of the two countries.
11. About 450 MW of power are transported from India to Nepal (Kumar, 2016).Nepal's energy reliance is further exacerbated by its ongoing imports of oil from India, in addition to electricity (Dhakal & Raut, 2010).
12. A total of US$35 million was imported in oil products between 2005 and 2006. Though about 50% of oil imports are for conveyance and, therefore, would not be counterbalanced by the development of hydroelectric properties, another 50% for housing, profit, and civic facilities would be balanced by replacing oil with hydroelectric power. So, the long-term result

of continuing fossil fuel dependence helps as an additional basis for increasing hydro-electricity capacity.

4.1 Hydropower Development and FDI in Nepal

Currently Nepal is witnessing the operations of many hydro-powers in Nepal. The development of hydropower could not have been successful without the support of other countries to Nepal. Many different countries have helped Nepal in the development here in Nepal. Nepal has been getting support in various forms such as Loan, Grants, etc. The list of the Hydropower Projects has been mentioned below.

4.1.1 Hydro powers Constructed Through Grants (Direct Investment)

These projects, which include some early India-invested ones like Pardi (1 MW), Trishulank (21 MW), and Devighat (14.1 MW), were mostly funded by China, India, and the former USSR. With Chinese aid, Sunkoshi (10.5 MW) and Seti (1.5 MW) were constructed. And the 2.4 MW Panauti Project was funded by the former USSR. We can assume that the USSR's Cold War political rivalry with the US was the driving force for its interest in Nepali hydropower. Up until the 1970s, grants constituted the most prevalent type of investment in bilateral aid; after that, loans predominated and grants decreased. Bilateral aid essentially came to an end toward the end of the 1970s, as multilateral investment took its place.

Table 2: Hydropower Project Constructed through Grants (Direct Investment)

Name	Capacity (MW)	Funded by
Pardi	1	India
Trishuli	21	India
Devighat	14.1	India
Sunkoshi	10.5	China
Seti	1.5	China
Panauti	2.4	Former USSR

*Source***:** nepalprojects.com

4.1.2 Hydro Powers Constructed Through Loans

Nepal has been dependent on bilateral and multilateral funding for hydropower since the 1970s, mostly from international financial institutions (IFIs) including the World Bank and Asian Development Bank. Together with other institutions, Japan, Kuwait, Germany, China, and Korea provided funding for hydropower projects in Nepal, including Kaligandaki 'A' (144 MW), Kulekhani I and II (60 MW and 32 MW), Marsyandi (69 MW), and Middle Marsyandi (70 MW). The completion of these bigger projects has been essential to supplying Nepal's growing electrical needs.

Table 3: Hydropower Project Constructed through Loans

Name	**Capacity (MW)**	**Funded by**
Kulekhani	92	WB, Japan, Kuwait
Marshyangdi	69	KFW
Kaligandaki A	144	ADB, JICA, WB
Middle Marshyangdi	70	KFW
Upper Trishuli 3A (under con- struction)	60	China
Upper Marshyangdi (under construction)	50	China
Chameliya (under construction)	30	Korea

*Source***:** nepalprojects.com

4.1.3 Hydro-powers Constructed Through FDIs

Structural adjustment initiatives created in the 1980s and 1990s by the International Monetary Fund, World Bank, and International Finance Corporation s significantly altered that mode of investing hydropower. Generally, those initiatives

needed host countries to perform specific economic changes in to be able for financing. Those measures had been designed to provide the market for free a bigger role in assisting a recipient country's financial aspects. Private multinational enterprises, like GMR (India) and Sutlaj (India), and parastatals, like Statkraft (Norway) are the forms of FDI, collaborating with IFIs to provide finance for bigger hydro projects. In this line, the United States financed in Bhotekosi of 45 MW with IFI contributions, while Norway assisted in financing Khimti of 60 MW.

The US and Norway not only contributed funding, but also technical support. Currently, private foreign investment from China and India is being used to create the West Seti (750 MW) and Upper Karnali (900 MW each) projects. Although the early successes of Bhotekosi and Khimti suggested that FDIs might have a prosperous future, the political unrest that has ruled since 1996 has hindered the flow of money. It is envisaged that initiatives such as West Seti and Upper Karnali would demonstrate to international business organizations that Nepal is once again a desirable place to make investments.

Table 4: Hydropower Project Constructed through FDIs

Name	Capacity (MW)	Funded by
Bhote Koshi	45	USA
Khimti	60	Norway
Upper Karnali (to be started)	900	India
(to be started)	900	India
West Seti (to be started)	750	China

Source: nepalprojects.com

4.1.4 Hydro-powers Constructed Through Both Internal and External Sources

The projects constructed using Nepali money alone or in conjunction with capital from other nations are included in this list. The Butwal Power Company's 12-meter Jhimruk project is an illustration of a project supported by Nepalis. Chilime (22 MW) was financed by a combination of foreign and domestic funding from Nepalis living abroad. Currently, the majority of the funding for Upper Tamakoshi (456 MW) is coming from Nepal. Meanwhile, Mai Khola (20 MW) will be constructed using funds from non-Nepali citizens (NRN) and local investment.

Table 5: Hydropower Project Constructed through both Internal and External Sources

Name	Capacity (MW)	Funded by
Jhimruk	12	BPC
Chilime	22	NEA
Upper Tamakoshi (under construction)	456	Local fund, NEA
Mai Khola (under construction)	20	Local fund and NRN

*Source:*Nepalprojects.com

4.1.5Major Proposed Hydropower Projects and Capacity

Table 6: Major Proposed Hydropower Projects and Capacity

SN	Name	Installed Capacity (MW	River
1	Dudh Koshi Storage	640	Koshi
2	Tamor Storage	530	Tamor
3	Upper Arun	335	Arun
4	Uttar Ganga Storage	300	Uttar Ganga

5	Chaipuur Set	140	Seti
6	Tamakoshi V	87	Tamakoshi
7	Upper Bheri	85	Bheri
8	Upper Modi A	42	Modi
9	Upper Modi	18.2	Modi
Total		2,177.2	

Source: Zou et al. 2022

4.2 Political Challenges of Water Management in Nepal-India Relations

The water relations between Nepal and India have been historically complex and multifaceted, influenced by political, economic, and geographical factors. Major political challenges of water management in Nepal India relations have been found and interpreted below.

Nepal's perception of itself as the weaker party in water-related negotiations with India is rooted in the significant power differential between the two countries. India's larger size, population, economy, and geopolitical influence in the region often create asymmetrical power dynamics that can hinder the attainment of equitable agreements. In transboundary water negotiations, the disparity in resources and capabilities between Nepal and India can tip the balance of power in India's favor, giving it greater leverage and bargaining power. This power asymmetry can manifest in various ways, including unequal access to technical expertise, financial resources, and political influence. As a result, Nepal may feel compelled to acquiesce to India's demands or face the risk of economic, diplomatic, or even security repercussions. Addressing these power differentials requires proactive efforts to enhance Nepal's capacity for water diplomacy, strengthen its negotiating position, and foster a more balanced and mutually beneficial approach to transboundary water cooperation with India. Nepal perceives itself as the weaker party in water-related negotiations with

India due to the significant power differential between the two countries. India's larger size, economy, and influence in the region often result in asymmetrical power dynamics that can impede equitable agreements. (Mishra, 2017)

The 1950 Indo-Nepal Treaty of Peace and Friendship and subsequent agreements have indeed played a pivotal role in shaping water-sharing arrangements between Nepal and India. However, Nepal contends that these treaties disproportionately favor India's interests and constrain Nepal's sovereignty over its water resources. The treaties, including the 1954 Kosi Agreement and the 1996 Mahakali Treaty, have often been criticized for their perceived asymmetry in benefit-sharing and decision-making processes. Nepal argues that historical agreements have perpetuated unequal power dynamics, resulting in limited control and ownership over its own water resources. Moreover, concerns have been raised regarding the adverse social, economic, and environmental impacts of large-scale Indian water projects on Nepal's territory. These grievances highlight the complexities of transboundary water management and underscore the need for renegotiation or revision of existing treaties to ensure a more equitable distribution of benefits and recognition of Nepal's sovereignty in water-related matters. Efforts to address these concerns require constructive dialogue, transparency, and mutual respect for each country's rights and interests in managing shared water resources for the benefit of both nations. The 1950 Indo-Nepal Treaty of Peace and Friendship and subsequent agreements have shaped water-sharing arrangements between the two countries. However, Nepal contends that these treaties disproportionately favor India's interests and restrict Nepal's sovereignty over its water resources. (Shrestha,2019)

Nepal's potential for hydropower development presents both opportunities and challenges. While India seeks to invest in Nepal's hydropower projects to meet its

growing energy demands, Nepal aims to assert control over its water resources and maximize benefits from hydropower generation. (Jha,2017) Nepal's potential for hydropower development presents a dual prospect of opportunities and challenges, particularly in its relationship with India. On one hand, India's interest in investing in Nepal's hydropower projects offers an opportunity for economic growth and regional cooperation. India's growing energy demands and Nepal's abundant water resources create a symbiotic relationship where India benefits from clean energy production, while Nepal gains investment, technology transfer, and revenue generation. However, Nepal also aims to assert control over its water resources and maximize the benefits derived from hydropower generation. This ambition reflects Nepal's desire for sovereignty and economic self-reliance, as well as its commitment to sustainable development and environmental stewardship. Balancing these objectives requires careful negotiation and collaboration between Nepal and India to ensure that hydropower development is mutually beneficial, respects sovereignty and environmental concerns, and contributes to the long-term prosperity and stability of both countries. Effective governance mechanisms, transparent agreements, and inclusive stakeholder engagement are essential for navigating the opportunities and challenges associated with hydropower development in the region.

Several rivers, including the Kosi, Gandaki, and Mahakali, flow across the Nepal-India border, necessitating cooperation for effective transboundary river management. Disputes over water utilization, flood management, and irrigation infrastructure have strained bilateral relations. (Bishta,2016) Transboundary rivers such as the Kosi, Gandaki, and Mahakali, which flow across the Nepal-India border, have become focal points of contention, requiring robust cooperation for effective management. Disputes over water utilization, flood management, and irrigation

infrastructure have strained bilateral relations between the two countries. Nepal seeks greater control over its water resources to support its economic development, particularly through hydropower generation, while also ensuring water security for its citizens. On the other hand, India, as a downstream riparian, emphasizes its water needs for agriculture, industry, and domestic consumption. This asymmetry in interests has led to tensions, especially during periods of water scarcity or flooding. Historical treaties and agreements, often perceived as favoring India, have further exacerbated mistrust and hindered collaborative efforts. Despite these challenges, both nations recognize the imperative of cooperation to address common challenges such as climate change impacts, water-related disasters, and sustainable development. Efforts to establish equitable water-sharing mechanisms, enhance flood management infrastructure, and promote joint river basin management initiatives are crucial for fostering trust and ensuring the sustainable use of transboundary rivers while promoting mutual benefits and regional stability.

The geopolitical context of South Asia, particularly India-China relations and regional power dynamics, significantly influences Nepal's water policies and its engagements with India. Nepal's strategic location between these two major powers adds complexity to its water relations with both countries. As India and China vie for influence and strategic advantages in the region, Nepal finds itself in a delicate balancing act, seeking to leverage its position to maximize benefits while avoiding undue pressure or interference from either side. Nepal's water policies are shaped not only by its own national interests but also by the geopolitical considerations of its larger neighbors. The growing strategic competition between India and China further complicates water-related negotiations and cooperation, as each country seeks to secure its own interests in water resources management and energy security. Against

this backdrop, Nepal navigates a nuanced diplomatic landscape, engaging with India and China on water-related issues while striving to maintain its sovereignty, independence, and strategic autonomy. Effective diplomacy, dialogue, and cooperation among all stakeholders are essential for addressing the complex geopolitical dynamics and promoting regional stability and sustainable development in South Asia. The geopolitical context of South Asia, including India-China relations and regional power dynamics, influences Nepal's water policies and its engagements with India. Nepal's strategic location between India and China adds complexity to its water relations with both countries. (Muni,2018)

Political challenges between Nepal and India in water relations often stem from complex geopolitical dynamics, historical grievances, and differing priorities regarding transboundary water resources management. One significant issue revolves around the utilization and development of shared rivers, which can lead to tensions and disputes between the two countries. The Mahakali Treaty of 1996, for example, sparked debates and disagreements over the equitable sharing of water resources between Nepal and India (Sakia, 2020). Additionally, controversies surrounding large-scale hydroelectric projects, such as the Kosi and Gandak Barrages, have underscored the need for improved cooperation and diplomatic negotiations to address the concerns of both countries (Kattel, 2018). These political challenges highlight the importance of constructive dialogue, mutual understanding, and joint efforts to promote sustainable water management practices and foster positive relations between Nepal and India.

To address these political challenges it requires diplomatic dialogue, mutual trust-building, and efforts to balance national interests with regional cooperation. Ongoing engagement and collaboration between Nepal and India are essential for managing water resources sustainably and fostering peaceful relations in the region.

CHAPTER V

ARUN III HYDROPOWER PROJECT

5.1 Arun III Hydropower Project Overview

The Arun III Hydropower Project is a significant infrastructure initiative located primarily in Sankhuwasabha for its generation facilities, including the dam site and powerhouse. The transmission infrastructure spans across multiple districts in Nepal, namely Sankhuwasabha, Bhojpur, Khotang, Udaypur, Siraha, Dhanusa, and Mahottari. This extensive project is developed by the SJVN Arun III Power Development Company (SAPDC). Financially, the project has a substantial total cost of NPR 144 billion as of 2020. It is designed as a Peaking Run-of-River (PRoR) type, allowing for 3.4 hours of peaking power generation each day. The project boasts a capacity of 900 megawatts (MW) and is expected to produce 3466 gigawatt-hours (GWh) annually.

The benefits of the Arun III project are multifaceted. Over the concession period, it is projected to generate NPR 348 billion in revenue. Additionally, the project will provide 21.9% of its energy for free and allocate NPR 1.6 billion in shares to the local community. It will also support rural electrification by offering 30 units of free electricity per Project Affected Family (PAF) each month. Furthermore, the project is anticipated to create 3000 direct employment opportunities, contributing significantly to the local economy.

Transmission of the generated power involves a 217-kilometer-long section within Nepal, operating at 400 kV double circuit, which will connect to Muzaffarpur in India. This cross-border linkage is vital for efficient power distribution and regional energy cooperation.

The Arun III project operates under a BOOT (Build-Own-Operate-Transfer) concession model. After the commercial operation date (COD), the company will manage the project for 25 years before transferring ownership. This model ensures that the initial developer oversees the project's establishment and operation phases, ensuring quality and reliability.

Table 7: Basic Details of Arun III Hydro Electricity Project

TITLE	DESCRIPTION
Location	Generation (Dam Site, Powerhouse): Sankhuwasabha, Transmission: Sankhuwasabha, Bhojpur, Khotang, Udaypur, Siraha, Dhanusa, Mahottari
Developer	SJVN Arun III Power Development Company (SAPDC)
Total Cost	NPR 144 billion (2020)
Type	PRoR (3.4 hours peaking per day)
Capacity	900 MW, 3466 GWh/Yr
Benefits	Revenue (during concession period): NPR 348 billion, Free Energy: 21.9%, Shares to local: NPR 1.6 billion, Rural electrification: Free 30 units per PAF/month, Employment: 3000 direct jobs
Transmission	217 km (Nepal Portion) 400 kV D/C Connecting to Muzaffarpur, India
Concession	BOOT, 25 years of operation after COD

Source: ibn.gov.np (Website of Investment Board of Nepal)

5.2 Information about the Respondents

Data related to the Arun III HEP were collected with the help of questionnaires. 52 locals were taken as the respondents.

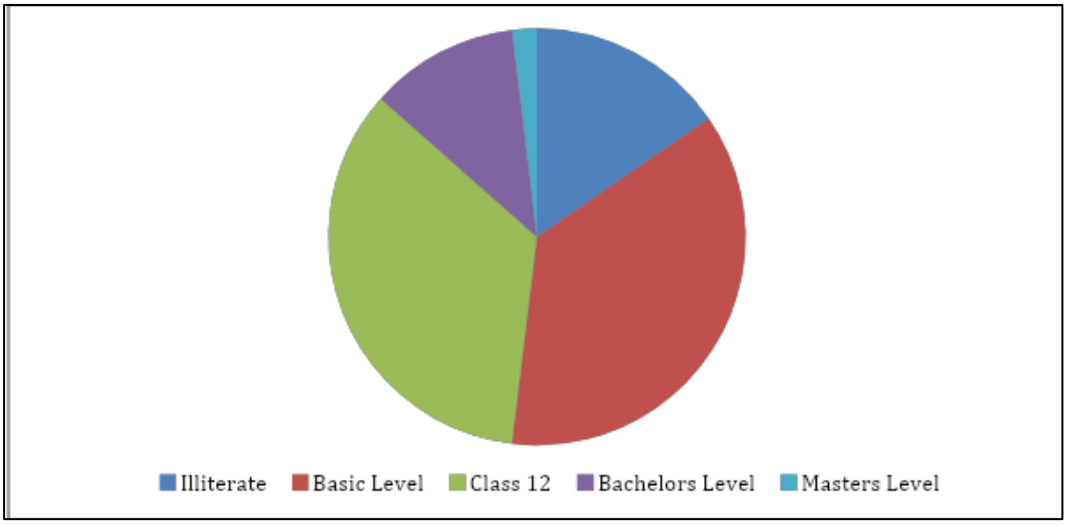

Fig. 2: Academic Qualifications of the Respondents

21 respondents had been asked to fill up the questionnaire. Since majority of the people seem to have a common narrative about the project,only 21 individuals were selected as the respondents. It was found that the majority of them were literate although few of them were found to be illiterate. Some people of the area have completed their High Schools whereas few of them have received Bachelors and Masters Degrees too.

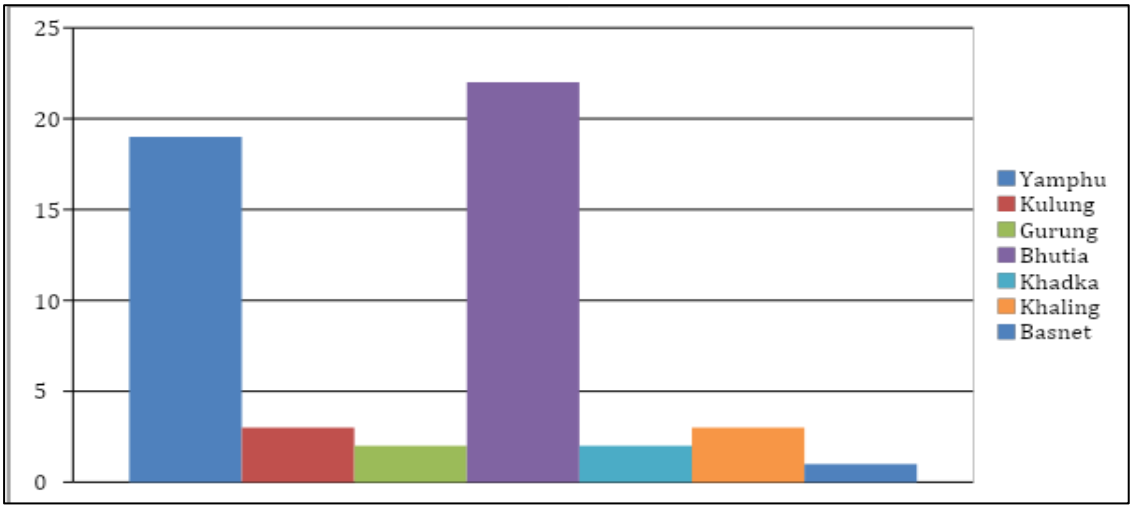

Fig 3: Ethnic Composition of the Respondents

When observing the community in respect to caste and ethnicity, the majority of the people are Bhutia and Rai. The sub castes of Rai such as Yamphu, Khaling and Kulung were found. People belonging to Khadka, Basnet and others were very few in numbers in the area of the project.

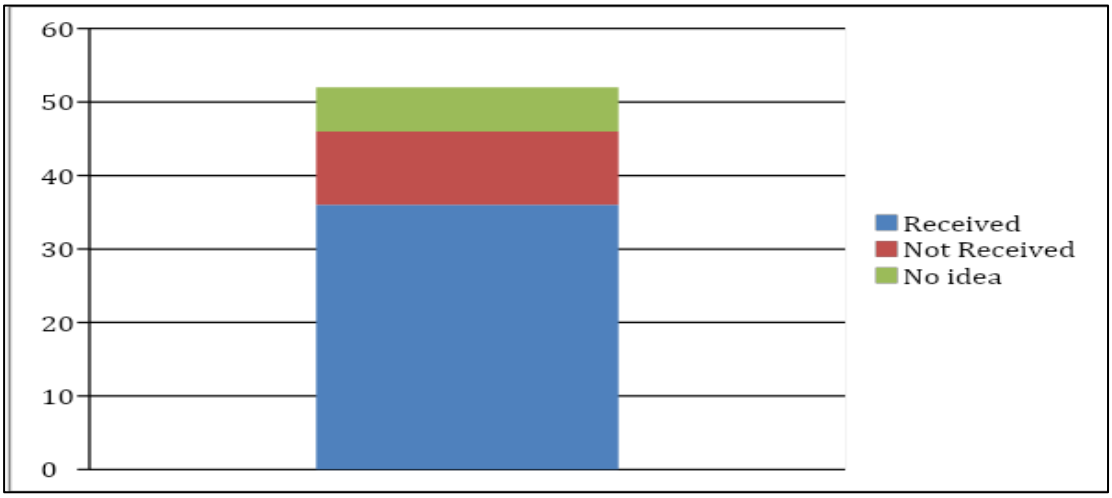

Fig.4: Compensation Received by the Respondents

The respondents were asked whether the locals were provided compensation for the land they have given to the project. Majority of the respondents stated that the compensations have been received. Few of them complained about not getting the compensations. Some of them reacted that they had no idea on this issue.

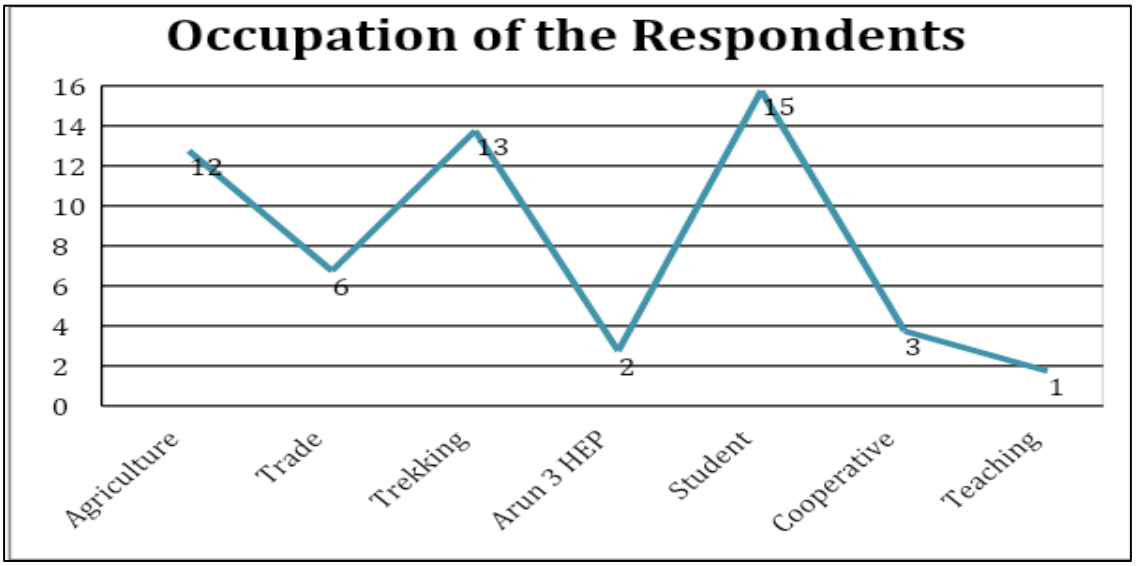

Fig. 5: Occupation of the Respondents

The locals varied according to the occupations and professions they carried on. The occupations followed in the region are Agriculture, Trades, Trekking, etc. Young people are found to be engaged in their studies. Few of them were employed in the Project. Cooperatives and Schools have created jobs for the local people.

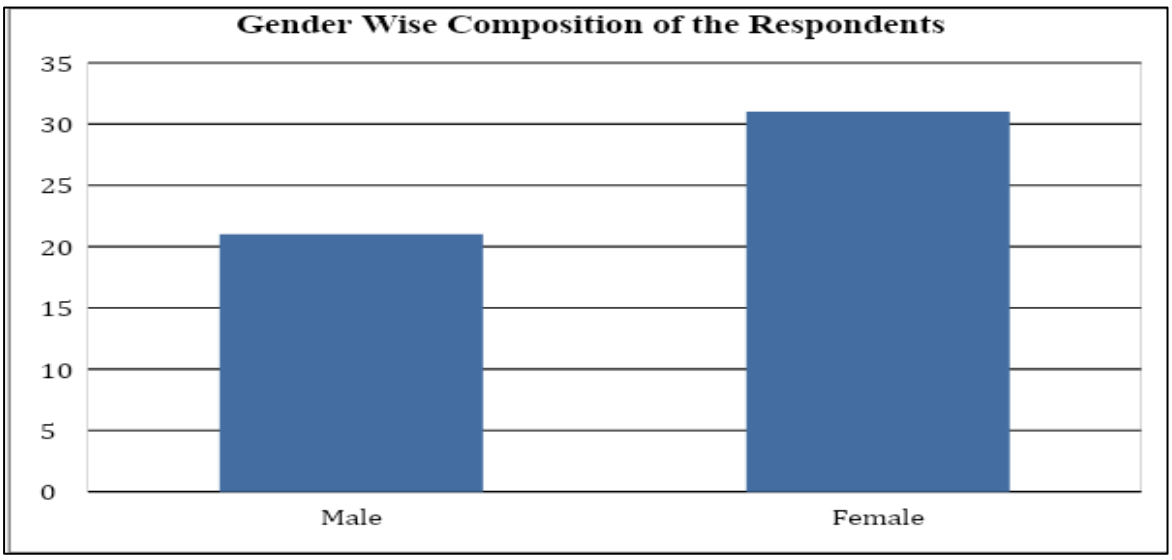

Fig. 6: Gender Wise Composition of the Respondents

More females were found to be the respondents of the project as compared to boys. The boys were occupied with their work hence more females had to fill up the questionnaire.

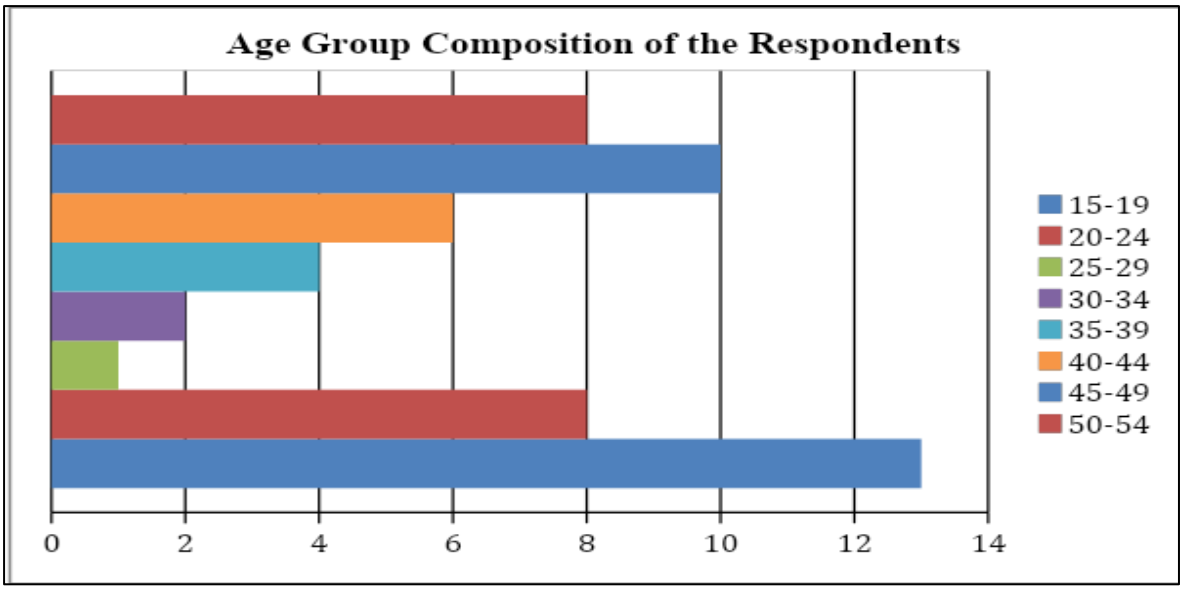

Fig. 7: Age Group Composition of the Respondents

While requesting the people to fill up the questionnaires, the majority of the respondents belong to the 15-19 age groups. The Minority of the respondents were from the 25-29 age groups. It can be estimated that the young adult ones are less present in the area. Majority of the adults are found to be working in the cities or in the foreign lands. The area comprises the very young children, retired middle aged and the elderly mostly.

From the questionnaires collected, it is found that the people of the area are highly benefited by the arrival of the project. Majority of the people are found to be positive towards the project. People who received the compensation money turned into a millionaire overnight. The farmers are found to be complaining about the fewer yields of crops after the arrival of the project. The environment is not healthy as before. Different developmental works have been conducted with the implementation of the project.

The arrival of the project has also brought about significant changes in the local economy and infrastructure. Many small businesses have sprung up to cater to the increased demand for goods and services, resulting in more job opportunities for the local population. However, this rapid development has also led to an increase in the cost of living, making it difficult for some residents to cope. Additionally, there are concerns about the long-term sustainability of these economic benefits, as the initial influx of money and resources might not be sufficient to maintain the growth. Despite these challenges, the overall sentiment remains optimistic, with the community hoping for continued progress and improvements in their quality of life.

5.3 Feedback of the Respondents on ARUN III HEP

The responses have been transcribed into table as below.

Table 8. Feedback of the Respondents on ARUN III HEP

Respondent No.	Gender	Academic	Ethnicity	Age	Adress	Occupation	Response About the Project
1	Female	Bachelors	Bhote	30	Makalu 5	Teacher	Positivity
2	Male	Bachelors	Limbu	42	Makalu 5	Trade	Positivity
3	Male	Basic	Gurung	45	Makalu 5	Agriculture	Positivity
4	Female	Grade12	Khadka	25	Makalu 5	Cooperative	Positivity
5	Male	Basic	Rai	50	Makalu 1	Agriculture	Positivity
6	Female	Grade12	Rai	26	Makalu 1	Student	Positivity
7	Male	Bachelors	Bhote	22	Makalu 5	Student	Positivity
8	Male	Basic	Bhote	44	Bhotkhola 2	Agriculture	Negativity
9	Male	Basic	Bhote	26	Bhotkhola 2	Trekking	Negativity
10	Female	Basic	Bhote	25	Bhotkhola 2	Agriculture	Negativity
11	Male	Grade12	Bhote	30	Bhotkhola 2	Trekking	Negativity
12	Female	Basic	Rai	48	Makalu 5	Agriculture	Positivity
13	Male	Basic	Bhote	33	Bhotkhola 2	Trekking	Negativity
14	Female	Basic	Rai	34	Makalu 5	trade	Positivity
15	Female	Grade12	Bhote	22	Bhotkhola 2	Student	Negativity
16	Female	Grade12	Bhote	21	Bhotkhola 2	Student	Negativity
17	Male	Grade12	Bhote	22	Bhotkhola 2	Student	Negativity
18	Female	Grade12	Bhote	19	Bhotkhola 2	Student	Negativity
19	Male	Grade12	Bhote	22	Bhotkhola 2	Student	Negativity
20	Female	Grade12	Bhote	20	Bhotkhola 2	Student	Negativity
21	Female	Basic	Rai	42	Makalu 5	Trade	Positivity

Respondent No.	Are you happy with the arrival of Project in your Locality?	Has the Project Created Job Opportunities in your Locality?	Has the Land owners been compensated?	Has the project created any disturbances?	Has the Project done Social Welfare activities?
1	Yes	No	Majority	Yes	Yes
2	Yes	Yes	Majority	Yes	Yes
3	Yes	Yes	Majority	No	No
4	Yes	No	No Idea	No	Yes
5	Yes	No	Majority	Yes	Yes
6	Yes	No	Majority	Yes	Yes
7	Yes	Yes	Majority	No	Yes
8	No	Yes	No Idea	No	No
9	No	Yes	No Idea	No	Yes
10	No	Yes	No Idea	No	Yes
11	No	Yes	No Idea	No	Yes
12	Yes	No	Majority	Yes	Yes
13	No	Yes	No Idea	No	Yes
14	Yes	Yes	Majority	Yes	Yes
15	No	No	No Idea	No	Yes
16	No	No	No Idea	No	Yes
17	No	No	No Idea	No	Yes
18	No	No	No Idea	No	Yes
19	No	No	No Idea	No	Yes
20	No	No	No Idea	No	Yes
21	Yes	Yes	Majority	Yes	Yes

The above table shows the feedback of the half of the respondents who were asked to fill up the questionnaires. From the table above it can be stated that the majority of the Locals are satisfied with the arrival of the project in the area whereas few of them are against the operating of the Arun III HEP.

5.4 Effects of Project on Local Communities

In order to analyze the Impacts of on local communities, the report of World Bank has been interpreted. In 1995, the independent redressal mechanism of the World Bank, the Inspection Panel, had a study considering the complaints submitted by the communities. The study concluded recommending the following findings:

5.4.1 Findings on Environmental Impact Assessment

Management's Proposals. The recommended measures relate to the direct impacts of the proposed choice of road alignment. A detailed comparative analysis of the valley and hill access routes, recommended by the Panel of Experts in 1992, was prepared after the April 1995 mission It confirms the proposal that the access road should be built along the valley alignment provided that the Environmental Impact Assessment takes into account the following:

(a) Spoils disposal;

(b) Impact on wildlife and aquatic Life:

(1) Avoidance of Makalu-Barun Conservation Area or mitigatory and compensation measures;

(2) Sal Forest patches: measures are to be included in the Regional Action Program discussed later in this report; and

(3) Aquatic life; and Impact of increased traffic on the market town of Hile.

1. Panel of Experts ("PoE"). The establishment of a second separate specialized PoE consisting of social and environmental experts is now proposed but has still to be created and appointed. The Panel notes that the original PoE has not been convened since October 1992. Therefore, it could not, as required, follow up on its recommendations. Mechanisms to ensure periodic PoE meetings and follow-up are therefore needed.

2. Glacial Lake Outburst Flooding: In addition to the measures proposed in Annex 2, Management has also addressed the problem of such flooding risks referred to in the Panel's preliminary report. In April Management convened a panel of experts which concluded that risks are real and that monitoring should commence immediately. HMG/N has arranged for financial assistance for a team of experts to carry out an investigation of the Barun glacier lakes starting towards the end of June.
3. Road Maintenance: During their field inspection, the Inspectors' verified monsoon flooding as a significant natural risk that requires attention. Uninterrupted motorized access is necessary to ensure that equipment can be brought in to the project site during construction. Without this, there is a high risk of considerable project delays and higher costs. The Panel finds that the choice of the valley route will require provision for appropriate funding of contingencies to cover maintenance in the event of road wash outs resulting from river flooding due to monsoon rains.
4. The April mission found there are families seriously affected by the access road project in Tumlingtar who sought rehabilitation but received no assistance. The mission also concluded that there may well be more families in the Basantapur area who have been similarly adversely affected.
5. The mission also noted that HMG/N had paid compensation to most of the 1,635 families whose land was acquired for the hill access road project. However, the legal process of transfer of ownership had been completed for only 15-20 percent; of this percentage, the land of only 18 families was in fact physically possessed by HMG/N.

6. With respect to those who were displaced in 1989-90, Management recommends that HMG/N investigate the conditions of the families whose land was actually physically possessed and in accordance with provisions of the borrower's guidelines offer rehabilitation assistance. The Panel notes that, although necessary both for those displaced and for a large portion of the Arun Valley population, provision for access to jobs/training is not adequately addressed.
7. The Inspectors found that the land of those who filed the Request for Inspection had been acquired but not physically possessed. They have been adversely affected by uncertainties over the last half decade as the result of the change in access road alignment. Their future is still uncertain. The Panel finds that IDA failed to observe in substance the policy requirements for supervision of resettlement components and consequently failed to enforce covenants in the Credit Agreement.
8. Management's proposed remedial measures with respect to land acquired but not possessed, as outlined in Annex 2, require that the borrower formulate a time-bound plan indicating which land is to be utilized for future road construction and which is to be returned, including measures for protecting the standard of living of those whose lands will be possessed and the procedures to enable original owners to regain their lands.
9. Valley Route: Management proposes an update of the Acquisition, Compensation and Rehabilitation Plan.
10. Implementation of Resettlement Plans. The Panel agrees with the 1991 consultant study of past experience in Nepal which concluded that more follow up and much more emphasis must be placed on monitoring and evaluation of both the land acquisition process and implementation It is worth noting that both

the Operations Evaluation Department and regional reviews of the Bank's experience with resettlement stress the central importance of early attention to strengthening governmental capacity to manage such programs The studies point out that monitoring by IDA has been chronically inadequate despite consistent findings that oversight must be exercised constantly during implementation and beyond.

11. Findings on Indigenous Peoples: Management proposes that the three actions required with respect to indigenous people should be extended to all residents of the Arun Valley. These actions are (1) informed participation through public consultations, (ii) security over land tenure, and (iii) an action program with socially and culturally appropriate components. The "action program" means the Regional Action Program.
12. The Inspectors found that people who qualify as "indigenous" under IDA's policy are scattered throughout the valley and live in conditions similar to those of non-indigenous people.

The above findings can be interpreted as below. The Inspection Panel of the World Bank conducted a study on the Hydroelectric Project in 1995 in response to complaints submitted by affected communities.

Social Impacts: Complaints regarding inadequate compensation, resettlement plans, and support for affected communities who were displaced or resettled due to the project. Allegations of insufficient consultation and participation of affected communities in project planning, decision-making, and benefit-sharing processes. Environmental Impacts: Complaints related to potential environmental degradation, habitat loss, water pollution, and impacts on biodiversity resulting from dam

construction and operation. Allegations of adverse effects on local water resources, including changes in river flow, water quality, and access to water for irrigation, fishing, and domestic use.

Cultural Impacts: Concerns about the preservation of cultural heritage sites, traditional practices, and indigenous rights in the project area, particularly regarding potential impacts on sacred sites or cultural practices.

Economic Impacts: Complaints regarding disruptions to traditional livelihoods, such as agriculture, fishing, and forestry, as well as concerns about alternative livelihood opportunities and income generation for affected communities. Allegations of inadequate employment opportunities and local hiring practices during the construction and operation phases of the project.

Governance and Accountability: Allegations of lack of transparency, accountability, and oversight in project planning, implementation, and monitoring processes, particularly regarding compliance with World Bank policies and safeguards. Concerns about the accessibility, effectiveness, and fairness of grievance redressal mechanisms for affected communities to raise concerns, seek remedies, and address grievances related to the project. The Panel's report likely included recommendations for addressing any identified shortcomings and ensuring compliance with World Bank policies and standards in future project implementation.

5.4.2 Land Acquisition

Land acquisition is the act of purchasing land by an individual in a permanent or temporary manner, or by any other means, in order to have control over such property, or to create a claim over it. Section 2(I) of the Land Acquisition Act 2076 (2019) defines land acquisition as the process of obtaining property from landowners for a defined purpose. It is a procedure by which the government acquires private land for infrastructure development and hydroelectric projects. In exchange, the

government and private sector must give the landowner reasonable market value compensation and be responsible for the rehabilitation and relocation of the affected landowners.

On the other hand, Eminent domain refers to the state's right to confiscate a citizen's private property without the property owner's agreement. In contrast, the current Land Acquisition Act 2076 (2019) clearly prohibits the use of force to acquire land. The existing legislation safeguards the public's rights and interests while condemning the forced seizure of private property, which contradicts the premise of eminent domain law. The new legislation was supposed to apply to land purchase by private enterprises; nevertheless, it now refers to acquisition by 'private entities.' A private entity is any entity that is not a government entity, such as a single proprietorship, joint venture, company, corporate entity, non-profit organization, or any other.

Before purchasing land, private hydropower businesses must file an application with the District Administrative Office. Section 3 of the Land Acquisition Act 2076 (2019) defines the repercussions that can be imposed on ecological, social, and economic systems. When submitting a report, specify how much land is necessary for the hydroelectric project. Determine the number of families affected by the land purchase, as well as its social impact.

It was found that the people were compensated for the lands that have been acquainted by the Project. The land price seemed to be hiked due to the arrival of the Project in the locality. Majority of the local people have been found to be impacted due to the project. Project had acquired the lands of the people to run the project. The land which didn’t have a good economic rate got the market price. People who became able to get the compensation grew rich overnight. The compensation provided by the project made the entire district economically stronger.

It is found that the compensations have been provided to the Locals whosoever lands have been acquired by the Project. Majority of the people who have been compensated were found to be satisfied with the amount provided by the project. Compensation has been provided with mutual understanding and consultation with the community. The public hearing was also done for the determination of the compensation for the acquisition of the land. The Locals were informed first before acquisitioning their lands. Every personnel who were the landowners had been informed first before acquisitioning their lands.

Most of the locals knew about the Project. Though majority of the people are found to be happy with the project, few of them were complaining about the Project disturbing the environment. Very few of the locals are employed by the project. Most of the employees are Indians such as the Engineers and Technicians. Few people have complained that the Floods and landslides have occurred more frequently due to the operation of the Project. The green forest had been changed into land vulnerable to landslides. Some of the households are still complaining that the compensation has not been provided to them. On one hand, the motor roads have been developed but on the other hand the places have been made more vulnerable to the Landslides and Floods. Some Locals complain that they have to lose their cardamom field due to the arrival of the Project. As everything has got brighter and darker aspects, this project ARUN III HEP also could not become exceptional.

5.4.3 Social Welfare Activities of SJVN ARUN III HEP

The SJVN Power Development Company has done public welfare task where the Project is being implemented. The details of the social welfare have been tabled as below as stated by the company.

Table 9: Social Welfare Activities of SJVN ARUN III HEP

S.N.	Particulars	Quantity	Donated Fund	Help Receiving Organization's Name and Address	Remarks
1.	Construction of Red Cross Building	1	25,00,000/-	District Red Cross Society, Khadbari, Sankhuwasabha	
	Construction of the Toilet	1-1	15,00,000/-	Office Tumlingtar Airport Mahendra Secondary School, Maneybhanjhyang, Sankhuwasabha	
	Road Cementing and Construction (From Makalu Resort, Tumlingtar to Giddhe)	2.23 km	1,66,00,000 /-	Khadbari Municipality, Ward No. 9	
	Ambulance	5		Chichila R.M. Makalu RM Silichyong RM District Hospital, Khadbari District Red Cross Society	Help Provided by Indian Embassy
	Medical Items	3 Health Posts	20,30,000/-	Primary Health Post, Makalu-5, Noom. Yaafu Health Post, Makalu-6, Makalu Dadagaun Health Post, Chichila-3, Daadagaun	(Complete blood count analyzer, Automatic Defibrillator, Cardiac monitor, semi-Automated clinical chemistry, analyzer, pulse oximeter, patient bed, stretcher, glucometer, first aid kit, wheel chair, needle destroyer, IV stand, trolley

					for oxygen cylinder, revolving stool, Autoclave, baby weighing scale, thermometer, Intubation set, Vaccine box etc.)
	Surgical Equipment related to COVID 19.	Different Equipment	1,17,98,368/-	District Hospital, Khadbari Municipality, Makalu RM, Chichila RM	2 no. ventilators, 1 no. patient monitor, 3 no. ICU bed, 7 no. patient bed (deluxe), concentrator, 5 pulse no. oxygen oximeter, laryngoscope, PPE's, 200 no. COVID- 19 Rapid Testing Kit, consumables etc.
	Help in Running of Health Camp	Once	1,00,000 /-	Chichila RM	
8.	Bag Distribution Programme	8 schools	6,85,000	Makalu RM, Chichila RM	Schools impacted by the projects.
9.	Jute Bag Distribution	3218 Households	7,50,000 /-	Makalu RM – 2903 households Bhotkhola RM- 315 households	
10.	Environmental Awareness Programme	1197 students of 11 schools	2,46,000/-	Shree Rajajarani Basic School, Makalu-3 Shree Singheswari Secondary School, Makalu-5 Shree Balbalika Basic School, Makalu-3 Shree Adarsha Basic School, Makalu-5 Shree Jalapa Secondary School, Chichila-3 Shree Triveni Basic School, Chichila-3 Shree Kharsu Basic School, Chichila-3 Shree Mahadev Basic School, Makalu-5 Shree Ahale Basic School, Chichila-2 Shree Jiwanjyoti Basic School, Chichila-2	

				Shree Ranidhunga Basic School, Makalu-5	
	Gardening Training	5 places	6,75,000/-	Projected affected people and groups (Makalu and Chichila RM)	
	Help to the Victims of Shishuwa River Landslide	Affected households	10,00,000/-	Silichyong RM	From the staff of SAPDS and major contractors
	Help to Cancer Victims	1	85,000/-	Diding-3	From the staff of SAPDS
	Help for Sports Development	2 times	1,00,000/-	Sports Development Committee Chichila RM	Fiscal Year 2075/76 Fiscal Year 2077/78
	Help for the Construction of isolation Ward and others	Once	20,00,000/-	Khadabari Municipality	Supported by JP and Pratel Engineering Pvt. Ltd.
	32-seater Bus	Once	In process	Singheswori Secondary School Makalu-5, Noom	
17.	32-seater Bus	Once		Manakamana Ratna Ambika Secondary School, Tumlingtar	
18.	Laboratory Equipment	One Health Posts	6,00,000/-	Daadagaun Health Post, Chichila -3.	On the process of trading
19.	Medicines and Materials	2 Health Institutes		Health Institutes of Makalu RM and Chichila RM	On the process of trading
20.	Blood Bank Materials	Once	28,61,000/-	District Red Cross Society, Khadbari	
21.	Funding the salary of 3Senior Doctors	13 months	91,00,000/-	District Hospital, Khadbari	
22.	Food Relief Package to the Victims of Flood	Sac of Rice	800 Sacks of Rice (20 Ton)	Chichila RM	
23.	Help to the victims of Fire	Once	50,000/-	Khadbari-7, Ramche	

Source: Head Office SJVN ARUN III HEP, Tumlingtar, Sankhuwasabha

As stated in the table above, the Arun III HEP Company is engaged in many Social Welfare Activities. It is found that the company has provided Rs. 25 lakhs to District Red Cross Society of Sankhuwasabha to build a Red Cross Building in Khadbari. Similarly, Rs 15 lakhs has been given to Tumlingtar Airport and Mahendra Secondary School to build a Toilet in each office. Rs. 1 crore and 66 lakhs has been provided Khadbari Municipality to cement the 2.23 km road Tumlingtar to Giddhe.Five ambulances have been provided to Chichila Rural Municipality, Makalu Municipality, Silichyong Municipality, District Hospital Khadbari and District Red Cross Society managed from Indian Embassy.

The company has provided Jute Bags to 3218 households worth 7 lakhs 50 thousand. The households benefited with the Jute bags are from Makalu and Bhotkhola Rural Municipalities. The Environment Awareness Programme was done in 11 different schools with 1197 students. The amount spent was 2 lakhs 46 thousand. The schools are:

1. Shree Rajajarani Basic School, Makalu-32
2. Shree Singheswari Secondary School, Makalu-5
3. Shree Balbalika Basic School, Makalu-3
4. Shree Adarsha Basic School, Makalu-5
5. Shree Jalapa Secondary School, Chichila-3
6. Shree Triveni Basic School, Chichila-3
7. Shree Kharsu Basic School, Chichila-3
8. Shree Mahadev Basic School, Makalu-5
9. Shree Ahale Basic School, Chichila-2
10. Shree Jiwanjyoti Basic School, Chichila-2
11. Shree Ranidhunga Basic School, Makalu-5

Besides these, the ARUN III HEP conducted Gardening Training in five places with a total cost of 6 lakhs 75 thousands for the people of Makalu and Chichila Rural Municipalities.

Medical Equipment were provided to the three health posts worth 20 lakhs, 30 thousands. The medical equipments were Complete blood count analyzer, Automatic Defibrillator, Cardiac monitor, semi-Automated clinical chemistry, analyzer, pulse oximeter, patient bed, stretcher, glucometer, first aid kit, wheel chair, needle destroyer, IV stand, trolley for oxygen cylinder, revolving stool, Autoclave, baby weighing scale, thermometer, Intubation set, Vaccine box etc. The Health posts were

1. Primary Health Post, Makalu-5, Noom.
2. Yaafu Health Post, Makalu-6, Makalu
3. Dadagaun Health Post, Chichila-3,Daadagaun

More surgical equipment to control COVID 19 were handed over, worth Rs. 1,78,98,368 /- to the District Hospital, Makalu and Chichila RMs . The equipment were 2 no. ventilators, 1 no. patient monitor, 3 no. ICU bed, 7 no. patient bed (deluxe), concentrator, 5 pulse no. oxygen oximeter, laryngoscope, PPE's, 200 no. COVID- 19 Rapid Testing Kit, consumables etc. A health camp was done in Chichila RM worth 1 lakh. Bags were distributed to the eight different schools of Makalu and Chichila RMs worth Rs. 6,85,000/-.

Staff of SPADC and the major contractors of the project helped worth 10 lakhs to the victims of Sishuwakhola Landslide in Slichyong RM.In the same way, a cancer victim of Diding 3 was provided 85 thousands. 1 lakh was provided to the Sports Development Committee of Chichila RM. JP and Pratel Engineering Pvt. Ltd donated 20 lakhs to District Hospital to construct an Isolation Ward. School buses were provided to the Singheswari School, Makalu-5 and Manakamana School,

Tumlingtar. Dadagaun Health post was benefited with Lab equipment worth 6 lakhs. Rs, 28,61,000/- was given to Red Cross Khadbari to manage the Blood bank. The 13 months salary worth 91 lakhs of 3 doctors of District Hospital was managed by the Project. 20 tonnes of rice were distributed to the flood victims in Chichila RM. A fire survivor was given 50 thousands to buy corrugated iron plates for roofing purposes. In this way, the project company and its stakeholders are found to be conducting social welfare activities. Due to these social welfare activities many individuals of the area have been benefited.

5.4.4 Perceptions of Peoples toward the Project:

Mixed perceptions have been collected from the people residing nearby the project. Most of the people were found to be satisfied with the project whereas few were against the operation of the project.

5.4.5 Benefits and Opportunities in General:

Many roads especially rural roads that link with the main Highway have been constructed with the development of the project. Due to the development of the roads, the rural areas have grown access with the District Headquarter availing of the modern facilities. The local communities have been lightened up with the arrival of the project. All the local areas had not been facilitated with electricity before the arrival of the project. With the availability of electricity, lives have been more comfortable than before. The local people have been employed according to their qualifications and skills. Many local individuals have been working on the daily wages basis as a general Laborer. Some of them were found to be working on a monthly pay basis.

The project benefits have been tabled as below.

Table 10: Project Benefits

Description	**Benefits**
Employment Generation and Socio Economic Upliftment	SAPDC to employ locals to the extent possible Various development activities will uplift the socio- economic level of the people in project Area Training to PAFs for employability. Local Benefit Sharing Plan. Nepal Employment and Skills Training Plan, and Nepal Industrial Benefits Plan
Development of Local Infrastructure	Development of new roads & bridges. A. Chainkutty to Diding (PH) (28.69 km) Phaksinda to Suntale (14.78 Km) Bridges on Khoktak Khola, Num Khola and Khagua Khola besides bridge on Arun river
Local Area Power	To each Local PAFs at 30 kWh per month
Rural Electrification and energy to local households	Development of a 33-K.V transmission line for rural electrification after the Final COD.

Source: Office of SJVN Power Development Company

The Hydroelectric Project aims to contribute to both employment generation and socioeconomic upliftment in the project area. Several strategies have been outlined to achieve these objectives. The project commits to prioritizing the

employment of local residents, ensuring that as many locals as possible are employed by the project.Various development initiatives will be undertaken to improve the socioeconomic conditions of the people living in the project area. These activities aim to enhance livelihood opportunities and overall well-being.

Specialized training programs will be provided to Project Affected Families (PAFs) to enhance their employability and skills, enabling them to participate in the project-related activities.A Local Benefit Sharing Plan will be implemented to ensure that the benefits of the project are shared with the local communities, fostering equitable development and prosperity. The Nepal Employment and Skills Training Plan will be implemented to equip local residents with the necessary skills and competencies to access employment opportunities generated by the project.The Nepal Industrial Benefits Plan aims to harness the economic potential of the project by promoting local industrial development and leveraging opportunities for economic growth.

In addition to socioeconomic benefits, the project also focuses on the development of local infrastructure and provision of essential services. New roads and bridges will be constructed, improving connectivity and accessibility in the project area. This includes the development of roads from Chainkutty to Diding and Phaksinda to Suntale, as well as the construction of bridges over various rivers. Each Local Project Affected Family (PAF) will receive a monthly power supply of 30 kWh, contributing to improved access to electricity and enhancing the quality of life in rural areas. A 33-K.V transmission line will be developed for rural electrification, ensuring that local households have access to reliable energy sources for their daily needs. Overall, the Hydroelectric Project aims to not only harness renewable energy resources but also to promote sustainable development, empower local communities,

and improve living standards in the project area. Through a combination of employment generation, socioeconomic upliftment, infrastructure development, and provision of essential services, the project seeks to create lasting positive impacts on the lives of the people it serves.

The project has helped to create job opportunities and uplift the socio economic condition of the people. SAPDC employed locals to the extent possible. Various development activities have uplifted the socio- economic level of the people in project Area. Training to PAFs for employability has been conducted. A Local Benefit Sharing Plan has been launched. Nepal Employment and Skills Training Plan, and Nepal Industrial Benefits Plan have been made. Similarly, local infrastructures have been developed. The infrastructures developed are

A. Chainkutty to Diding Road(PH) (28.69 km)
B. Phaksinda to Suntale Road(14.78 Km)
C. Bridges on Khoktak Khola,
D. Num Khola and Khagua Khola besides bridge on Arun river

It has been decided that 33 KV transmission lines will be separated for rural electrification after the final COD.

5.5 SWOT Analysis of the ARUN III HEP

SWOT analysis is a strategic planning tool used to assess the internal and external factors that can affect the success of a project. The acronym SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. SWOT analysis is typically conducted through a structured process that involves gathering information, analyzing data, and synthesizing findings into a concise summary. The goal is to provide decision-makers with actionable insights that can inform strategic planning, resource allocation, and risk management efforts.

5.5.1 Strengths of the Project

Renewable Energy Source: Hydroelectric power is a renewable energy source, meaning it relies on the natural flow of water, which is sustainable and does not deplete finite resources like fossil fuels.

Large Capacity: With an installed capacity of around 900 megawatts, has the potential to generate significant amounts of electricity, contributing to the energy security of Nepal and the region.

Reduced Greenhouse Gas Emissions: Hydroelectric power generation produces minimal greenhouse gas emissions compared to fossil fuels, helping to mitigate climate change and reduce air pollution.

Stable and Reliable Power Generation: Hydroelectric power plants can provide stable and reliable electricity generation, offering a consistent source of power that is less susceptible to fluctuations compared to some other renewable energy sources like wind or solar.

Local Economic Development: The construction and operation of the hydroelectric project can create employment opportunities and stimulate economic growth in the region, benefiting local communities and businesses.

Energy Independence: By harnessing its abundant water resources for electricity generation, Nepal can reduce its dependence on imported energy sources, enhancing energy independence and security.

Infrastructure Development: The construction of the hydroelectric project involves the development of essential infrastructure such as dams, powerhouses, transmission lines, and roads, which can also benefit the overall development of the region.

Contribution to Regional Cooperation: The project involves collaboration between Nepal and India, fostering regional cooperation and strengthening diplomatic ties between the two countries.

Long Lifespan: Hydroelectric power plants typically have long operational lifespans, providing a reliable source of electricity for several decades with proper maintenance and management.

Environmental Benefits: While large-scale hydropower projects can have environmental impacts, they often involve measures to mitigate these impacts and can contribute to biodiversity conservation, watershed management, and ecosystem restoration efforts.

5.5.2 Weaknesses of the Project

Environmental Impact: Large-scale hydroelectric projects can have significant environmental consequences, including habitat disruption, alteration of water flow patterns, and impacts on aquatic ecosystems. Mitigating these effects while maintaining project viability can be challenging.

Social Displacement: The construction of dams and reservoirs for hydroelectric projects often necessitates the relocation of communities, leading to social disruption, loss of livelihoods, and cultural heritage. Managing resettlement processes and addressing the needs of affected populations is crucial but can be complex and contentious.

Geological Risks: Hydroelectric projects are vulnerable to geological hazards such as landslides, earthquakes, and soil erosion. Ensuring the stability and safety of dam structures and reservoirs in seismically active regions like Nepal is essential but presents technical challenges

Financial Viability: Large infrastructure projects like Arun III HEP require substantial investment, and cost overruns or delays can undermine their economic feasibility. Securing financing and managing project finances effectively throughout the construction and operation phases is critical to avoid financial risks.

Regulatory and Political Challenges: Hydroelectric projects are subject to regulatory requirements and permitting processes, which can be time-consuming and complex. Political instability or changes in government policies may also affect project implementation and operation, leading to uncertainty for investors and stakeholders.

Operational Efficiency: Maintaining efficient operation and maintenance practices is essential for maximizing power generation and revenue generation over the project's lifespan. Issues such as equipment failure, technical glitches, or inadequate infrastructure maintenance can impact project performance.

Water Availability: Hydroelectric projects depend on consistent water availability to generate electricity. Factors such as climate change, variability in rainfall patterns, and competing water use can affect water availability, posing operational challenges and reducing power generation potential.

Transmission Infrastructure: Efficient transmission and distribution infrastructure are necessary for delivering electricity generated by the project to end-users. Inadequate or outdated transmission systems can limit the project's ability to supply power to consumers reliably and efficiently.

Security Concerns: Large-scale infrastructure projects may face security threats from various sources, including theft, vandalism, or sabotage. Ensuring the security of project assets and personnel is essential to safeguard against such risks.

Public Opposition: Hydroelectric projects often face opposition from local communities, environmental groups, and other stakeholders concerned about their impacts. Addressing public concerns, fostering dialogue, and engaging stakeholders in decision-making processes are essential for building consensus and minimizing resistance.

5.5.3 Opportunities of the Project

Power Generation: The primary opportunity is power generation. The project aims to harness the hydroelectric potential of the Arun River to generate a significant amount of electricity. This electricity can be crucial for meeting the growing energy demands in Nepal and potentially for export to neighboring countries.

Infrastructure Development: The construction and operation of the hydroelectric project involve significant infrastructure development. This includes the construction of dams, powerhouses, transmission lines, and associated facilities. These infrastructure projects can stimulate economic activity and create job opportunities.

Job Creation: The project is likely to create employment opportunities both directly and indirectly. There will be jobs in the construction phase, including skilled and unskilled labor, engineers, project managers, and various support roles. Additionally, there will be long-term employment opportunities during the operational phase.

Revenue Generation: The project can contribute to government revenue through various means, including taxes, royalties, and other financial arrangements. The revenue generated can be used for public welfare, infrastructure development, and other essential services.

Regional Development: The development of the Hydroelectric Project may contribute to the overall development of the region where it is located. Improved infrastructure, access to electricity, and associated developments can enhance the standard of living and attract further investments.

Energy Security: The project can contribute to enhancing energy security in Nepal by diversifying the country's energy mix. Hydropower projects are often seen as a reliable and renewable source of energy, reducing dependence on fossil fuels.

Foreign Investment: Large infrastructure projects often attract foreign direct investment. The involvement of international investors and companies in the project can bring in capital, technology, and expertise.

Regional Cooperation: The project may provide an opportunity for regional cooperation, especially if there are plans to export electricity to neighboring countries. Collaborative efforts in energy production and distribution can strengthen diplomatic ties and promote economic cooperation.

5.5.4 Threats to the Project

Environmental Impact: Large hydropower projects can have significant environmental impacts. The construction of dams and alterations to river flows can lead to habitat disruption, water quality changes, and potential threats to aquatic ecosystems. The project must adhere to strict environmental regulations and conduct thorough impact assessments to mitigate these risks.

Social and Cultural Displacement: The construction of dams often requires the resettlement of communities living in the project area. This displacement can result in social and cultural disruptions for the affected communities. Addressing these issues requires careful planning, community engagement, and fair compensation and resettlement practices.

Geological Risks: The construction and operation of hydroelectric projects involve significant geological considerations. Landslides, earthquakes, and other geological events can pose threats to the stability and safety of the infrastructure. Robust engineering and risk mitigation measures are necessary to address these concerns.

Financing and Economic Viability: Large infrastructure projects, including hydroelectric plants, often require substantial financial investments. Economic viability can be threatened by cost overruns, delays, and unforeseen challenges during construction. Securing and managing finances effectively is crucial for the success of the project.

Regulatory and Policy Risks: Changes in government policies, regulatory frameworks, or political instability can pose risks to the project. Fluctuations in regulatory environments may impact project timelines, financing, and overall feasibility.

Climate Change Impact: Climate change can affect hydroelectric projects by altering precipitation patterns, river flows, and water availability. Changes in climate conditions may impact the long-term sustainability and reliability of hydropower generation.

5.6 Political Challenges on Arun III Hydro Electricity Project

Nepal Political challenges related to the Arun III Hydroelectric Project include issues related to governance, policy, stakeholder engagement, and geopolitical dynamics. Political instability, corruption, and bureaucratic hurdles may pose challenges to the effective implementation of the project (Bhattacharyya, 2016; Myint & Rose, 2015). Political instability, corruption, and bureaucratic hurdles can significantly impede the successful implementation of large-scale infrastructure

projects like the Arun III Hydroelectric Project. These challenges are often intertwined and can exacerbate each other, leading to delays, cost overruns, and even project failures. In regions prone to political instability, changes in government leadership, policy shifts, and regulatory instability can create uncertainty for project developers and investors. Political transitions, conflicts, or unrest may lead to disruptions in project planning, financing, and execution. Furthermore, political instability can undermine public confidence in the project, hampering stakeholder support and cooperation.

Corruption in the form of bribery, kickbacks, and nepotism can undermine the transparency and integrity of the project procurement process. Corrupt practices may distort decision-making, favoring certain contractors or suppliers over others based on personal connections rather than merit. This can result in inflated project costs, substandard quality of materials and construction, and misallocation of resources, ultimately compromising the project's long-term viability and sustainability. Complex bureaucratic procedures, red tape, and inefficient regulatory processes can lead to delays and administrative bottlenecks in project approvals, permits, and licensing. Cumbersome bureaucratic hurdles may require extensive time and resources to navigate, contributing to project delays and escalating costs. Moreover, lack of coordination and communication among government agencies and stakeholders can further exacerbate bureaucratic challenges, hindering timely decision-making and implementation.

Disputes over land acquisition, resettlement, and compensation can lead to conflicts between project developers, government agencies, and local communities (Khanal et al., 2018; Pandey et al., 2019).Disputes over land acquisition, resettlement, and compensation are common sources of conflict between project developers,

government agencies, and local communities, particularly in the context of large-scale infrastructure projects like the Hydroelectric Project. Local communities often rely on land and natural resources for their livelihoods, cultural identity, and social cohesion. The acquisition of land for project development can disrupt these traditional relationships, leading to grievances, resistance, and protests from affected communities. Moreover, inadequate compensation, lack of consultation, and perceived injustices in the resettlement process can exacerbate tensions and erode trust between stakeholders. Conflicts arising from land-related issues can delay project implementation, escalate costs, and damage the reputation of project developers and government agencies. Effective stakeholder engagement, transparent decision-making processes, and fair and equitable compensation mechanisms are essential for addressing land-related disputes and fostering constructive dialogue and cooperation among all parties involved in the project.

Changes in government policies, regulations, and legal frameworks may affect project timelines, financing, and operations (Hossain et al., 2017; Shah, 2018). The project's location near international borders may raise geopolitical tensions and require careful diplomatic negotiations (Haque, 2019; IEEFA, 2020).The location of the Hydroelectric Project near international borders, particularly if it involves neighboring countries like India, has the potential to raise geopolitical tensions and necessitate careful diplomatic negotiations. Electricity generated from the project, which is intended to be distributed to India, adds another layer of complexity to the geopolitical dynamics. Energy cooperation and cross-border electricity trade can be contentious issues, as they involve considerations of national sovereignty, security, and economic interests. In this context, the Arun III project may become a focal point for diplomatic discussions and negotiations between Nepal and India to address concerns related to energy security, resource allocation, and bilateral relations.

Effective diplomacy, transparent agreements, and mutual benefits are crucial for mitigating geopolitical tensions and ensuring the successful implementation and operation of the project, while also promoting regional cooperation and stability in South Asia.

Political debates over environmental impact assessments, biodiversity conservation, and water resource management can delay project approvals and implementation (ADB, 2017; World Bank, 2018). Coordination and cooperation between different levels of government (national, regional, local) may be challenging, especially in federal or decentralized political systems (Shrestha & Shrestha, 2016; Wagle et al., 2020).

Political opposition from environmental activists, civil society groups, and opposition parties can significantly influence public opinion and policy decisions related to the Arun III Hydroelectric Project. These stakeholders often raise concerns about the project's potential environmental impacts, such as habitat destruction, biodiversity loss, and disruption of local ecosystems. Moreover, they may criticize the project's social and cultural implications, including displacement of communities, loss of livelihoods, and infringement of indigenous rights. By mobilizing public support through advocacy campaigns, protests, and legal challenges, opposition groups can exert pressure on government authorities and project developers to reconsider project plans, implement stricter environmental safeguards, and engage in meaningful consultation with affected communities. As a result, political leaders and policymakers may face heightened scrutiny and public demand for transparency, accountability, and sustainability in decision-making processes related to the project. Political opposition from environmental activists, civil society groups, and opposition parties may influence public opinion and policy decisions related to the project (Wagle & Gautam, 2019; Upreti, 2020).

CHAPTER VI

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Although Nepal and India have enjoyed friendly religious, cultural, socioeconomic, and people-to-people contacts from time immemorial, British East India's domination over Nepal's foreign policy began with the signing of the Sugauli Treaty in 1816. During that time, Nepal was barred from maintaining contacts with foreign powers without British approval. Following India's independence in 1947, the Rana administration in Nepal faced intense pressure from the democratic movement. During that time, India presented the "Indo-Nepal Treaty of Peace and Friendship, 1950," which Rana Prime Minister Mohan Shumsher signed in the hopes of gaining Indian help to continue his government. Nepal-India relations is often pronounced as the matrimonial relation of 'RotiBeti' because Nepalese people living in Terai region are dependent on the Indian market for their daily life whereas cross border marital relations is in wider existence between Nepal and India.

Foreign policy is critical for ensuring a country's sovereignty, territorial integrity, independence, and economic growth. It would, however, be significant in the context of a strong economy, political authority, and military might. Nonetheless, foreign and economic policies are complementary components that work together to achieve similar goals. The Nepalese economy is tiny, with India accounting for two-thirds of the GDP and providing access to the sea. For this reason, India seeks to influence Nepal's economic, security, and foreign policy. The fundamental objective of Nepal’s foreign policy is to enhance the dignity of the nation by safeguarding sovereignty, territorial integrity, independence, and promoting economic wellbeing and prosperity of Nepal. It is also aimed at contributing to global peace, harmony and security.

Incidents of India's economic blockades in 1969, 1989, and 2015 demonstrate that India always expresses major unhappiness by utilizing economic force anytime Nepal attempts to break free from Indian reliance on economic, military, international, or political issues. Despite Nepal and India's century-long relationship, multiple anti-Indian agitations have occurred in Nepal at various times.

According to Nepal Rastra Bank (NRB), India's paid-up capital set a record of NPR 41.47 billion, followed by China's NPR 26.81 billion. It is working on huge projects such as Arun III hydro, which is worth 900 MW and costs roughly USD 1.6 billion, and is seen as critical for Nepal. India's investments included 6% in agroforestry, 1% in construction, negligible amounts in information technology and mining, 34% in services, 30% in tourism, and 25% in manufacturing. Nepal India Treaty of 1950 provided special preferences to Indian government and private firms to engage in economic matters due to which investment of Indian ventures increased in Nepal after Nepal adopted liberal economic policy in the 1990s.

Nepal and India, the two South Asian neighbors, have entered into a number of agreements/treaties in water resources, namely, Sarada Agreement (1920), Koshi Agreement (1954), Gandak Agreement (1959) and Mahakali Treaty (1996). Water diplomacy is defined as the art or practice of using water as a tool for conducting international relations. Water diplomacy can be bilateral, between two involved parties, or include the involvement of a third party. Nepal and India have signed several agreements for the utilization and control of trans-boundary water. The issue of water resources has always received due prominence on the agenda of bilateral meetings between Nepal and India.

Hydropower sector was liberalized under the policy formulated in 1992. The on-site activity to implement private sector projects only started in 1996 and the first

power project (Khimti) was commissioned in July 2000, during the 9th Five-year plan. is a run-of-the river-type hydro-electric project under construction on the Arun River in Sankhuwasabha District of Nepal of 900 megawatts capacity and will be the largest hydropower plant in South Asia. It is constructed by SJVN Power Development Company Private Limited (a wholly owned subsidiary of SJVN Ltd). The project cost will include an investment of more than $156m to develop the transmission line. It is being developed on a build-own-operate and transfer (BOOT) basis by Satluj Jal Vidyut Nigam (SJVN) Power Development Company (SAPDC), a joint venture of the Government of India and the Government of Himachal Pradesh.

The research is focused on studying the Nepal-Indo political challenges in managing water management policy. As per the PDA, the Indian company will allot Rs 1.6 billion worth of shares to the locals. Fifty percent of it will be allotted within two years of project construction commencement. The project will provide 21.9 percent free energy to Nepal. The project's construction is expected to generate 3,000 jobs in Nepal and India. The project also aims to develop the area by constructing new roads, bridges and amenities such as schools, hospitals and community centers.

The installed capacity of the Arun III Hydroelectric Project is around 900 megawatts (MW). It is a significant power generation project aimed at addressing the energy needs of Nepal and potentially contributing to regional energy demand. The primary purpose of the Project is to generate clean and renewable energy. Hydropower projects play a crucial role in meeting the growing demand for electricity, reducing dependence on fossil fuels, and contributing to sustainable development.

IR related theory Realism has been studied as the research philosophy for this research. Realism is the set of related theories of international relations that emphasizes the role of the state, national interest, and military power in world politics. It emphasizes the role of the nation-state and makes a broad assumption that all nation-states are motivated by national interests, or, at best, national interests disguised as moral concerns.

The descriptive and diagnostic research designs have been used. The study has been conducted among the Tumlingtar, Sankhuwasabha district, Nepal. The Head Office of ARUN III HEP, Kathmandu also has been consulted. Both the primary data and secondary data have been collected. Different journals and the periodicals have been consulted to collect the secondary information. The research has collected both the secondary data and primary data. Descriptive and analytical methods have been employed for data analysis in order to draw conclusions in this research.

The findings of the Independent Redressal Mechanism of the World Bank, the Inspection Panel regarding the ARUN III HEP have been discussed along the benefits to the public through the Project. The SWOT analysis have been done while studying about the project. The case study of the ARUN III HEP is a reference sample about the Nepal India Relations.

The relationship between Nepal and India is multifaceted, encompassing historical, economic, political, and cultural dimensions. While challenges exist, both countries have also demonstrated the capacity for cooperation and the potential for mutual development. The trajectory of their relationship may continue to evolve based on diplomatic efforts, regional dynamics, and shared interests. Nepal and India share deep-rooted historical, cultural, and familial ties. The open border and people-to-people contacts have played a significant role in fostering these connections.

Economic ties between the two countries have been substantial. Trade, transit, and investment have been key components of the bilateral relationship. India has been a major trading partner and a source of foreign investment for Nepal.The shared river basins, particularly the Ganges and Brahmaputra rivers, have been central to discussions and agreements between the two countries. Water-related treaties and cooperation in hydropower projects have been key elements of their diplomatic engagement.

The political relation has experienced both cooperative and challenging phases. Differences over political, economic, and border-related issues have led to periodic tensions. Border disputes, including issues related to territories like Kalapani, Lipulekh, and Limpiyadhura, have been a source of tension. The demarcation of the Nepal-India border has been a subject of historical contention. Both countries have engaged in diplomatic efforts to address differences and enhance bilateral ties. High-level visits, joint committees, and dialogue mechanisms have been utilized to promote understanding and cooperation.

Cultural and people-to-people ties remain strong, with shared traditions, languages, and familial connections. Educational and cultural exchanges contribute to strengthening these bonds. Despite historical ties, challenges such as border disputes, perceived interference in internal affairs, and economic imbalances have led to periodic strains in the relationship. Opportunities for collaboration exist in various areas, including economic development, infrastructure projects, tourism, and regional connectivity. Exploring common ground and mutual benefits is essential for fostering a positive relationship. For the betterment of the project, we have to foster open and continuous communication with local communities, ensure that their concerns are addressed, and involve them in decision-making processes. More social development programmes that benefit the communities in the project area have to be implemented.

The major political challenges in Nepal-India relations revolve around issues of sovereignty, border disputes, and political interference. Nepal has historically grappled with concerns over perceived Indian dominance and interference in its internal affairs, leading to strains in bilateral relations. Border disputes, particularly regarding the Kalapani and Susta regions, have intermittently strained relations between the two countries. Furthermore, issues related to water-sharing agreements and hydroelectric projects, such as the Mahakali Treaty, have sparked tensions. Additionally, Nepal's political landscape, characterized by shifts in government and evolving geopolitical dynamics, often influences the nature of its relationship with India. Balancing national sovereignty, political autonomy, and economic cooperation remains a persistent challenge in Nepal-India relations.

The major political challenges surrounding Arun III Hydroelectric Project primarily stem from issues related to governance, sovereignty, and stakeholder engagement. Nepal's efforts to harness its hydroelectric potential face governance challenges, including bureaucratic hurdles, regulatory complexities, and corruption concerns. Sovereignty issues arise due to the project's location near international borders, leading to geopolitical tensions and diplomatic negotiations. Additionally, ensuring equitable benefit-sharing and addressing the concerns of local communities and indigenous groups impacted by the project pose significant challenges. Balancing national development goals with environmental conservation and social welfare considerations further complicates the political landscape surrounding.

As for Environmental Sustainability and to prioritize and adhere to robust environmental impact assessments (EIA), sustainable practices should be implemented during construction and operation to minimize ecological impacts. Investment should be made in environmental conservation and restoration initiatives.

Maintaining transparency in project development, finances, and decision-making is a must. Engagement in open dialogue with stakeholders, including local communities, governmental bodies, and non-governmental organizations should be increased. Exploration and adoption of cutting-edge technologies for efficient power generation and infrastructure development are necessary. Comprehensive risk management strategy has to be developed that addresses potential challenges such as geological risks, regulatory changes, and project delays. Prioritizing the hiring and training of local talent has to be done. Investment in skill development programs to enhance the capabilities of the local workforce is must. Stakeholder engagement and proactive measures to mitigate potential challenges throughout the project lifecycle are very important. Careful planning, environmental impact assessments, and community engagement are crucial to addressing potential challenges and ensuring sustainable development.

Overall, navigating these political challenges requires effective governance mechanisms, transparent decision-making processes, and inclusive stakeholder engagement to ensure the project's success and promote sustainable development. Establishing more robust bilateral mechanisms for water management is essential for addressing both technical and political challenges that arise in transboundary river basins. As noted by Rai (2019), implementing joint river basin organizations and holding regular high-level meetings between riparian countries can significantly improve coordination and foster trust. These mechanisms provide a platform for sharing data, exchanging information, and coordinating efforts on water-related issues such as flood management, hydropower development, and environmental conservation. By engaging in structured dialogue and collaboration, countries can

better understand each other's concerns, identify common interests, and work towards mutually beneficial solutions. Moreover, regular high-level meetings enable policymakers to discuss emerging challenges, resolve disputes, and negotiate agreements in a diplomatic and transparent manner. Ultimately, robust bilateral mechanisms for water management promote peace, stability, and sustainable development in transboundary river basins, benefiting both upstream and downstream communities.

Future negotiations on water-related issues should prioritize inclusivity and transparency, engaging stakeholders from both countries, including local communities, to ensure that agreements are fair, equitable, and sustainable. By involving a diverse range of stakeholders in the negotiation process, including government representatives, civil society organizations, indigenous groups, and affected communities, decision-making becomes more democratic and representative of the interests and concerns of all parties involved. Inclusivity ensures that marginalized voices are heard and taken into account, particularly those of local communities who are directly affected by water management decisions. Furthermore, transparency in negotiations helps build trust and credibility, as it allows for open communication, information sharing, and public scrutiny of decision-making processes. When negotiations are conducted in a transparent and inclusive manner, agreements are more likely to be perceived as legitimate and acceptable to all parties, reducing the risk of conflicts and enhancing the prospects for long-term cooperation and sustainable management of shared water resources. Therefore, fostering inclusivity and transparency in future negotiations is essential for promoting cooperation, building mutual understanding, and achieving equitable outcomes that

benefit both countries and their respective populations. Future negotiations should be more inclusive and transparent, involving stakeholders from both countries, including local communities, to ensure that agreements are fair and equitable (Upreti, 2006).

Adopting an Integrated Water Resources Management approach can help balance development needs with environmental sustainability and social equity. Both countries should invest in shared research and data collection to support IWRM (Pandey, 2020). Adopting an Integrated Water Resources Management (IWRM) approach is crucial for balancing development needs with environmental sustainability and social equity in transboundary river basins. By incorporating principles of IWRM, such as holistic planning, stakeholder participation, and adaptive management, both countries can effectively manage water resources in a way that promotes economic growth while safeguarding environmental integrity and addressing social equity concerns. Investing in shared research and data collection to support IWRM enables informed decision-making and collaborative management of shared water resources. By pooling resources and expertise, countries can enhance their understanding of hydrological processes, climate change impacts, and socio-economic dynamics, facilitating the development of evidence-based policies and strategies for sustainable water management. Through coordinated efforts and shared knowledge, adopting an IWRM approach can foster cooperation, resilience, and long-term sustainability in transboundary water management.

Developing joint climate adaptation strategies is essential to address the impacts of climate change on shared water resources. Collaborative research and implementation of adaptive measures can enhance resilience (Shrestha, 2016). Implementation of joint climate adaptation strategies, such as integrated watershed

management, water conservation measures, and infrastructure upgrades, can improve the resilience of shared water resources and enhance the ability of communities to cope with changing environmental conditions. Moreover, by fostering cooperation and dialogue, joint adaptation efforts can promote trust, build capacity, and facilitate the exchange of best practices and lessons learned among riparian countries, ultimately contributing to the sustainable management and equitable utilization of transboundary water resources in the face of climate change.

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APPENDICES

Appendix 1: Questionnaire

Questionnaire (प्रश्नावली)

Full Name

(पूरानाम):……

…

Age (उमेर):…… Gender (लिङ्ग) :……

Education (शिक्षा) :……. Ethnicity (जात)

:…… Profession/Occupation(पेसा) : …….

Address (ठेगाना)

:……

What do you know about ARUN III HEP?

अरुणतेस्रोजलविद्दुतआयोजनाबारेतपाईलाईकेकेहिथाहाछकि ?

……

……

1. **How has the Project affected you and your locality? परियोजनाले तपाईंलाई र तपाईंको गाउघरलाई कसरी प्रभाव गरेको छ?**

   .....

   .....

2. **Has there been any disturbance due to the Project? परियोजनाको कारणले तपाईहरुलाई कुनै अफ्ठ्यारो भएकोछ कि ? के भएको छ ?**

   .....

   .....

3. **The Land owned by the Project used to be owned by the Local People. Have the Local people been compensated? अहिले परियोजनाको स्वामित्वमा रहेको जग्गा स्थानीयजनताको स्वामित्वमा हुने गर्थ्यो। स्थानीयले केहि मुआब्जापाए कि ?**

……

……

4. **Are you happy to have the Project in your locality? Why? के तपाईं आफ्नो क्षेत्रमा परियोजना संचालन हुदा खुसी हुनुहुन्छ? किन?**

……

……

5. **Are the Locals been employed in the Project? परियोजनामा स्थानीयलाई रोजगारी दिइएको छ ?**

……

……

6. **The Project might have disturbed the environment. Has any environmental impacts observed? परियोजनाले वातावरण बिग्रिएको हुनसक्छ । के कुनै वातावरणीय प्रभावहरू अवलोकन गरिएको छ कि ?**

……

……

7. **What specific changes do you find in your locality before the introduction of the Project and now with the ongoing Project? तपाईको क्षेत्रमा परियोजना सुरुहुनु अघि र अहिले मा तपाईले केहि परिवर्तनहरू पाउनु भएको छ कि ?**

……

……

8. **The Project might have done social work in the locality. Will you please write some of them? परियोजनाले तपाईको समाजमा सामाजिक कार्य गरेको हुन सक्छ ।उल्लेख गर्नुहोस ?**

……

……

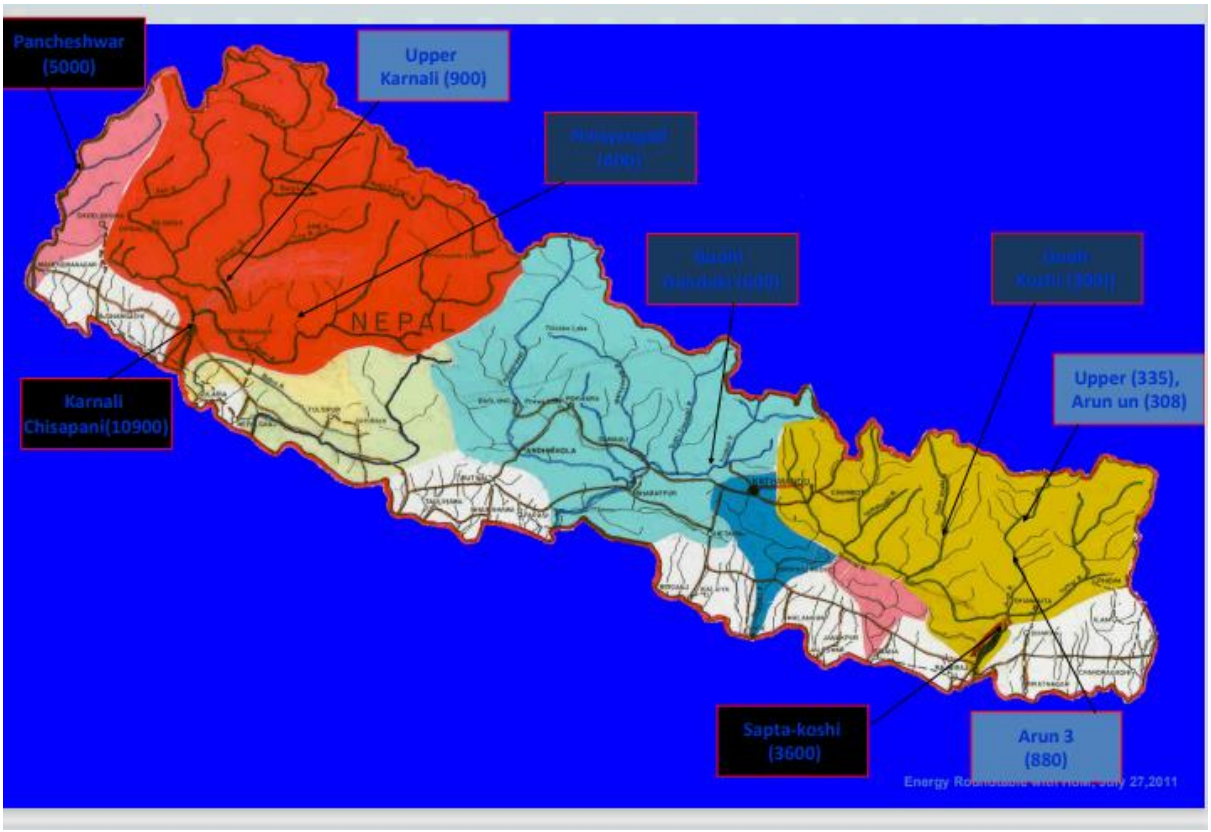
9. **Do you think the Project will be completed within the estimated time? Why? तोकिएको समयमा परियोजना पूरा हुन्छ होला त ? किन?**

.....

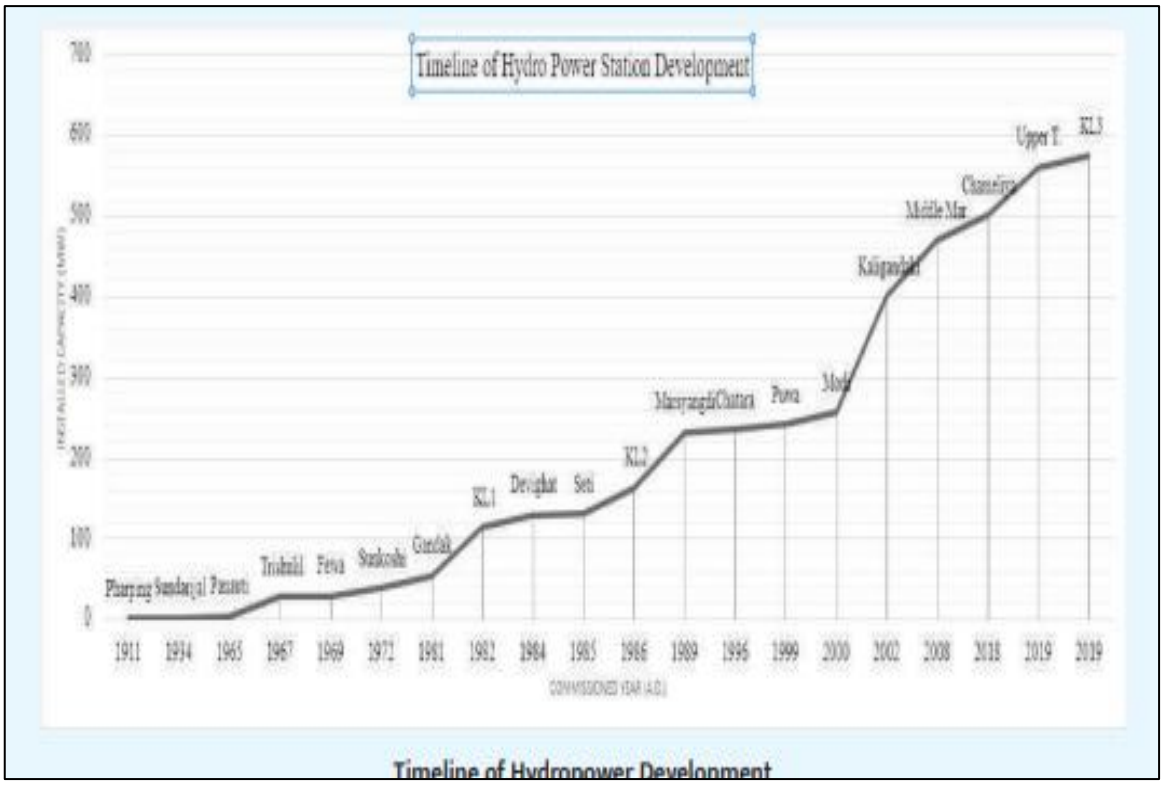
.....

Appendix 2: Major Rivers of Nepal

Appendix 3: Major Hydro Electricity Projects of Nepal



Appendix 4: Timeline of Hydropower Development In Nepal



Timeline of Hydropower Development

Source: NEA Annual Report 2021/2022

Appendix 5: Relative Advantage of Hydropower in Nepal

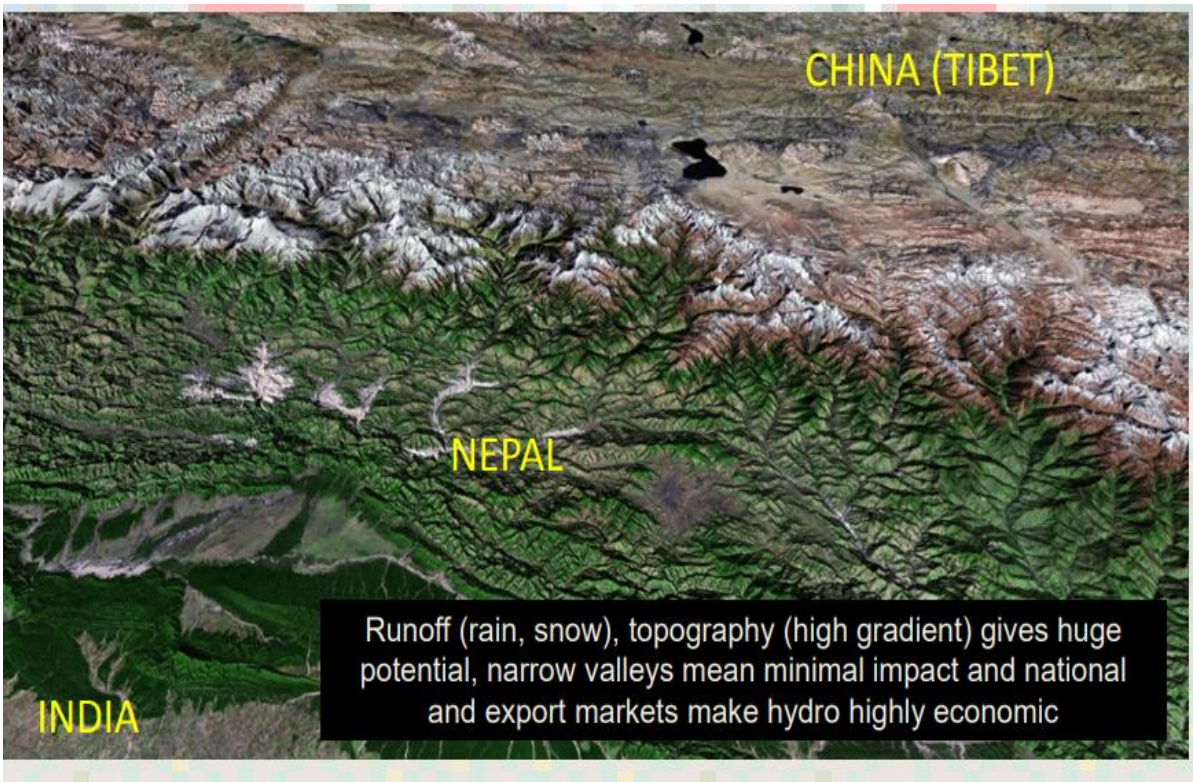
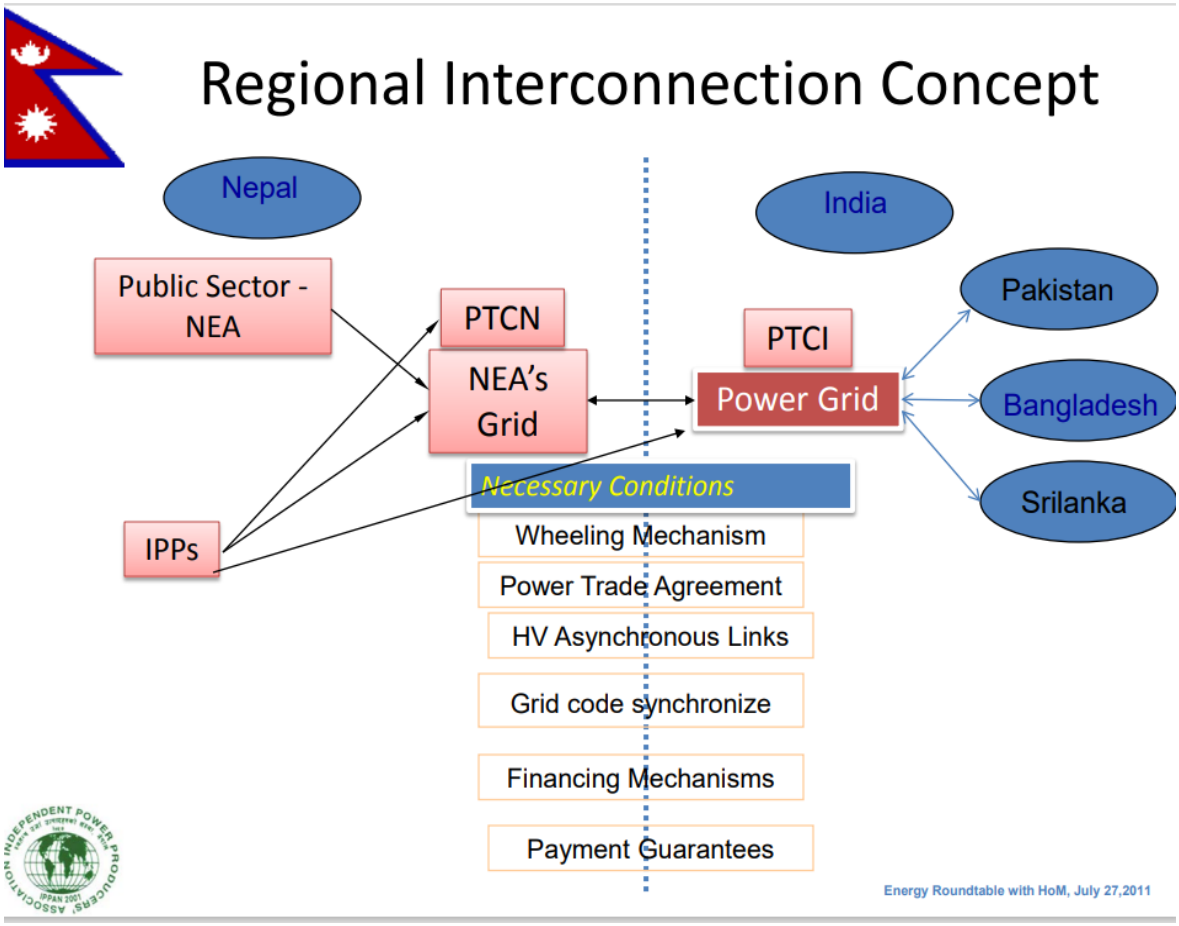


Fig: Relative Advantage of Hydropower in Nepal

Appendix 6: Regional Inter Connection Concept



Source: Independent Power Producers Association

Appendix 7: Basic Data of ARUN III HEP

Source: IBN Website,(ibn.gov.np)

Appendix 8: Investment Approval in FY 2021/2022

S.N.	Date of Board Meeting	Board Meeting	Project	Approved Investment (in billion Rs.)
1.	2021 October 9	48th	Jumkhola Hydroelectric Project	10.53
2.	2021 October 9	48th	Arun-3 Hydroelectric Project	62.26
3.	2022 February 8	49th	Dabur Nepal Pvt. Ltd.	9.69
4.	2022 April 10	50th	Suryatara Cement Project	14.28
5.	2022 June 6	51st	Tamakoshi-5 Hydroelectric Project	16.46
6.	2022 June 6	51st	Rahughat Hydroelectric Project	9.47
			Total	**122.69**

A total of Rs. 122.69 billion was approved in FY 2021/22.

Source: IBN Annual Report 2021/2022

Appendix 9: Nepal, Facts and Figures

NEPAL: FACTS AND FIGURES

Economic diplomacy

Foreign trade:

- Export NPR 97,109 million; Import NPR 1,418,559 million (TEPC)
- Top five export destination countries: India, USA, Germany, Turkey, China
- Top five source countries of import: India, China, Indonesia, USA, Canada

Foreign direct investment:

- NPR 332,832 million (Ministry of Industry)

Top five foreign investors:

- China (Mainland), India, China (Hong Kong SAR), USA, South Korea

Tourism:

- yearly tourist arrival: 1,197,191 (Immigration Department)
- Top five tourist source countries: India, China, USA, Sri Lanka, UK

Official development assistance:

- US$ 1,979,564,312 (MOF, AMIS)
- Top five bilateral development partners: US, UK, India, China, Japan
- Top five multilateral development partners: WB, ADB, EU, UN, GAVI
- Monetary unit: Nepali Rupee (NPR) US$ 1=approximately NPR 115
- GDP: NPR 3,767,043 million (US$ 32 billion)
- GDP per capita: US$ 1,085 (Economic Survey 2019/20)

Overseas Employment:

- labour permits and renewals: 3,68,433 persons (Department of Foreign Employment)
- Number of bilateral agreements between Nepal and labour destination countries: 9
- Top five destinations for overseas employment: Saudi Arabia, Malaysia, Qatar, UAE and Kuwait

Service Delivery

Passports distributed

- Total passports: 398,842
- Ordinary passports: 397,053
- Official passports: 1,260
- Diplomatic passports: 443
- Travel documents: 86

Consular services

- Documents attested: 229,295
- Visa recommendations issued: 1,089
- Diplomatic exemptions granted: 3,062
- Gratis visas issued: 1,736
- Rescue and repatriation: 28,000
- Compensation handed over to beneficiaries: NPR 696,500,374
- Repatriation of dead bodies: 533

Source: Report on Nepal's Foreign Affairs, MOFA, 2020

Appendix 10: Factsheet (i) of ARUN III HEP

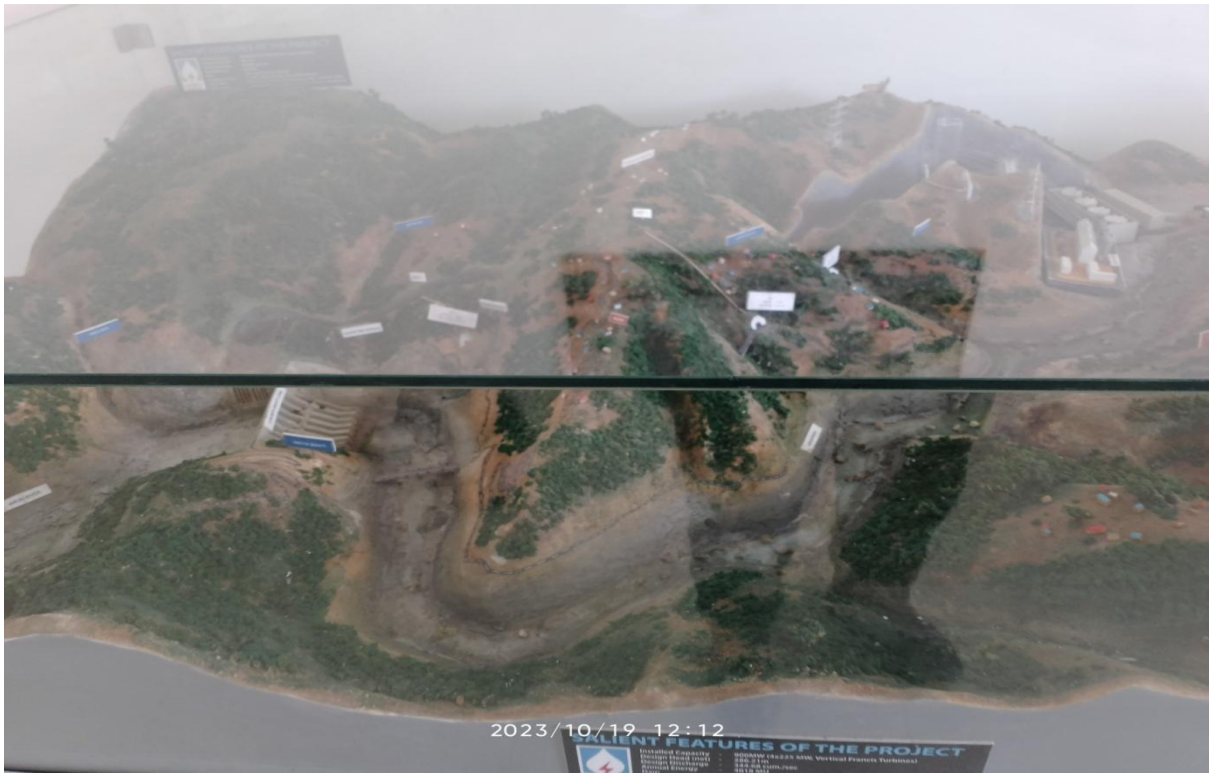
Source: IBN Website

Appendix 11: Factsheet (ii) of ARUN III HEP

Source: Investment Board of Nepal

Appendix 12: Photos

Salient Features of the Project



An Overview of the ARUN III HEP Area

A **Researcher at the Head Office of Arun III Power Development Company**

SJVN Arun III Power Development Company Pvt.Ltd

Arun Sadan, SAPDC Complex, Ward No. 9, Tumlingtar,

Khandbari Municipality, Sakhuwasabaha, Nepal

A photo taken with Mr. Bipul Thakur , an HR Manager of SJVN Arun III Power Development Company Pvt.Ltd

As the Researcher takes a break at the bank of River Arun.

During a stay in Local Hotel in Khadbari, Sankhuwasabha.