

Research Article

Energy Geopolitics and Energy Security of Nepal: Agent-structure Dynamics in the India-China Rivalry in Nepal

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Abstract

A four-day military conflict between India and Pakistan in May 2025 and the unilateral suspension of Indus Water Treaty (IWT) by India has opened energy front in the south Asian security and political dynamism. The global emerging powers China and India need clean energy for their industrial growth and economic sustainability and Nepal is a viable option with huge hydroelectricity potentiality. The core objective of the study is to analyze the energy geopolitics in south Asia and energy security of Nepal in the present regional political context. It also aims at analyzing the existing energy security policies of Nepal. The study adopts Alexander E Wendt's approach 'agent-structure problem in international relation' to analyze the impact on Nepal due to water resource rivalry between India and China in south Asia. Using a descriptive -analytical design primarily based on secondary sources collected from various policy documents, news and academic literatures and one key informant interview (security expert, July 2025), the study finds that energy front is added in the geopolitical rivalry between India and China in south Asia. It also finds India and China are rivaling in water resource of Nepal and India is gaining leverages over the water resource of Nepal. The energy security of Nepal is at high stake if foreign power monopolized the water resources of Nepal. It suggests the adoption of significant energy security strategies on the overall energy security policy of Nepal.

Keywords

Energy Geopolitics, Multipolarity, Energy Security, Nepal Hydropower, Indus Water Treaty

1. Introduction

The International Energy Agency (IEA) defines energy security as “the uninterrupted availability of energy sources at an affordable price”. Hisham Khatib (2015) defines energy security as an uninterrupted availability of energy in sufficient amount at affordable price [16]. US Interior secretary David L. Bernhardt (2019) links energy security to national security [6]. The progress of human civilization directly associated with the new sources and ways of using energies, and the interruption of the supply of energy can create social and political

unrest as well as war between the nations, therefore energy security has direct nexus to the national security [34]. 7% of total energy demand is fulfilled by fossil fuels, 52 countries have been importing half of their primary energy from fossil fuels which can be reduced by 70% saving 1.3 trillion USD globally each year [11]. The data presented by EMBER indicates energy is at risk and the world is moving towards energy insecurity.

According to the report of Our World in Data- 2024, Per

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capita electricity generation from hydropower per person of India is 108 kWh, China-954 kWh, Nepal-356kWh, Bhutan-14193kWh, Pakistan-137kWh and Bangladesh is 5kWh [26]. C.V.J. Varma mentions 500 kWh/yr per capita electricity is a minimum electricity required for quality of life [33]. According to the World Energy Trilemma Index 2023, China ranked 47th, India 74th, and Nepal 91st in energy security [38]. The energy security of India is rooted on its economic and environmental strategy which is aimed at producing renewable energy, improving transmission grids, and reducing carbon emission [20]. China as a large energy consumer nation of fossil fuels especially coal and oil which is imported from foreign nations faces challenges on energy security because of geopolitical tensions and domestic and regional political instability. Energy security is considered as an important aspect of economic and national security of any nation. Chinese should achieve greater independence in energy and President Xi also highlighted energy security as an important security issue of China [12]. China and India are both facing severe challenges in energy security because of global geopolitics as well as geoeconomics. The energy security strategies of both nations aim at achieving independence in energy security by reducing carbon emissions and generation of renewable energies especially hydroelectricity for which Nepal's great unexplored hydro potentiality will be the best option for both nations. The growing geopolitical rivalry between India and China in Nepal centering hydroelectricity will have greater impact on energy security, economic security and finally to the national security of Nepal.

According to Alexander Wendt's 'agent-structure problem in international relation theory' there is always interactions between the agents (states and non-state actors) and structures (cultural and institutional) in international relations which shapes the course and actions of agent and structures. However, it is always a matter of study whose actions impact whom in the interactions between agents and structures [36]. The study focuses on identifying the role of Nepal through 'agent-structure relationship' in its relationship with India and China in regional structures. The suspension of Indus River Treaty by India after Phalgam terror attack in 25th April 2025, recent military conflicts between India and Pakistan, and Pakistan Army Chief's statement to destroy dam by missiles constructed by India in Indus River has flared up the regional energy conflict in south Asia. The study analyzes geopolitical rivalry between India and China over the water resources and the energy security of Nepal.

2. Research Methodology

The research is qualitative in design and it is descriptive and analytical. The study is primarily based on secondary data which is collected from various websites, books, journals and news articles. The energy policies of the government of Nepal are retrieved from the related websites of Nepal Government. The news required for the study is retrieved from various

national and international daily and weekly online news portal. The news article analysis covers the time period after a four-day military conflict from 7th to 10th May 2025 between India and Pakistan. It only covers the news article related to the water resources issues in south Asia.

A key informant interview with the security expert is also conducted to acquire primary data regarding the changing security dynamics after a four-day Indo-Pak military conflict and its implications in water resources of Nepal. An open-ended interview is conducted on 30th July 2025 with retired Nepali Army Major General Purna Bahadur Silwal (author of the book 'Nepal's Instability Conundrum') in Kathmandu. The acquired data is particularly used for the comparison of the different analysis regarding south Asian security dynamics. The collected primary and secondary data are focused on analyzing the recent significant activities in south Asian politics centering the water resources and its implications on energy security of Nepal.

3. Literature Review

The literature review focuses on analyzing the energy geopolitics in south Asia especially between India and China over Nepal's water resources. It emphasizes the recent security and political dynamism of south Asia centering towards water resources. The literature review also focuses on analyzing the present energy security policies of Nepal including India's power purchase policy 2018 and China's Implementation Plan of WRDS (Western Region Development Strategy) 2021. The geopolitical rivalry between India and China in Nepal is analyzed from the security perspective by many scholars. Many scholars also present their argument on the connectivity in the Sino-Indian geopolitical rivalry in Nepal. Few scholars also state the Sino-Indian competition in water resources as a new sector of rivalry in Nepal. The literature review focuses on analyzing the recent security and political dynamism after the suspension of Indus Water treaty by India and objection over the construction of hydropower dam in Yarlung Tsangpo (Brahmaputra). The literature review also focuses on analyzing the policies of Nepal in energy security in the present security and political dynamism.

3.1. Theoretical Review

Mark Zeitoun & Jeroen Warner (2006) present hydro-hegemony theoretical framework to analyze cross-border water conflicts between the bordering nations. The framework analyzes the powers between the bordering nations /their conflict of interest on water resource, and their share on the water resource. The power asymmetries among the bordering nations determines the outcome which will not be equal on sharing [40].

The International Energy Agency (IEA) defines energy security as "the uninterrupted availability of energy sources at an affordable price". Hisham Khatib (2015) also supports the

definition of IEA whereas US Interior secretary David L. Bernhardt (2019) and Wackman (2023) links energy security to national security. The energy security definition of IEA is considered as an operational definition for the study.

The world experienced the bipolar world where two major powers USA and USSR dominated world. The disintegration of USSR changed the world balance of power from bipolar to unipolar world led by USA. Ashford and Cooper (2022) state that the unipolar world of USA is shifted to the complex multipolar world with the emergence of various state actors in global politics. China, Russia, Brazil, South Africa, India, Japan are emerged the main actor in international politics.

Cherp & Jewell (2014) mentions that traditional energy security concept of 4As (Availability, Accessibility, Affordability, and Acceptability) is not sufficient to address the present energy security issues. Therefore, the authors present the concept of Vital Energy System (VES) in energy security particularly to address the three existing problems (Security form whom, Security for which values, and from what threats) which are not addressed by 4As concept [7].

3.2. Empirical Review

On 5th Feb 2016, Saeed Ahmed presents a paper entitled “Regional Climate Change, Water Crisis and Kashmir” at Kashmir Day Conference held in Colombo, Sri Lanka. The author views that the global climate change has adversely impacted south Asia not only in human development front but also in economic front. South Asian economy is particularly based on agriculture, fisheries and forestry which is only possible because of the water sources originated from Himalaya glaciers. The climate change has more prioritized the nations particularly India, China and Pakistan into Kashmir because of the abundant water resources available in Kashmir. The author also highlights the conflicts of India with Pakistan, China, Bangladesh and Nepal regarding water resources. The reluctance on information sharing between India and China regarding the water flow in Brahmaputra River can lead to second Indo-China war. [2].

Table 1. Chinese company withdrawing from hydropower projects in Nepal.

Chinese Invested Projects		
Project	Capacity (MW)	Developer
Upper Marshyangdi-2	327	BPC-SCIG
Manang Marshyangdi	135	BPC-SCIG
Lower Manang Marshyangdi	139.2	BPC-SCIG
Upper Trishuli-2	102	Hydro China Co
Rasuwa Bhotekoshi	120	Sichuan Investment
Bheri-1	270	Gezhouba
Bheri-2	256	Gezhouba
Tamor	756	HIDCL-Power China
Chinese Company existed projects		
Project	Capacity (MW)	Reason
Humla Karnali-1	235	Investment Uncertainty
Humla Karnali-2	335	Investment Uncertainty
Kaligandaki Gorge	164	Market Uncertainty
Kaligandaki	1200	Government Withdraw
West Seti	750	Government Withdraw

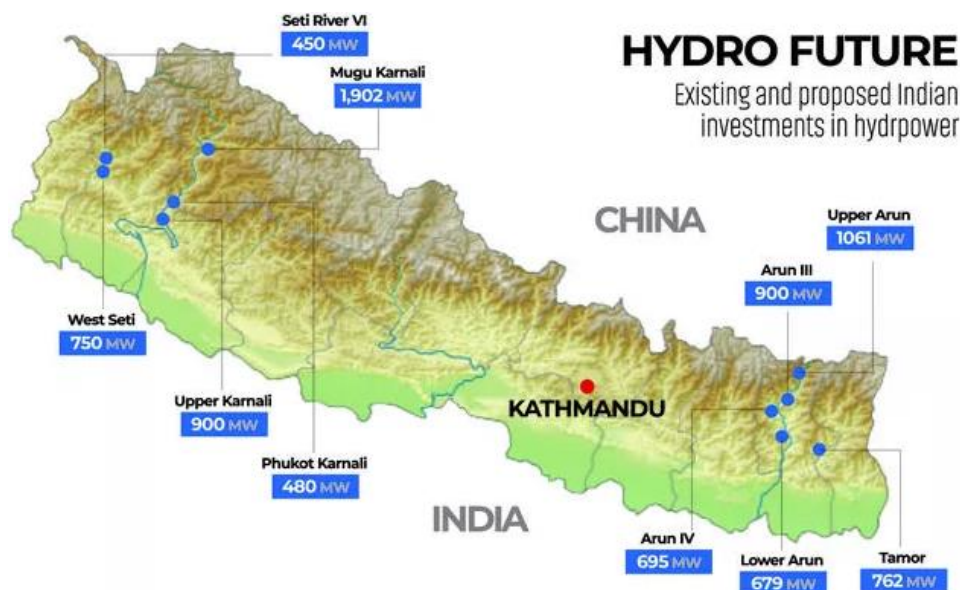
Note. Nepal Energy Forum (2023, June 23). Copyright NEF Online Pvt. Ltd.

Nepal Energy Forum (2023) highlights energy geopolitical interest of China focuses on fulfilling the energy required for its western provinces through cross border energy network. India also needs water resources of Nepal for clean energy and

irrigation and it gained greater leverages on the water resources of Nepal. The hydropower sector has become a prime sector of geopolitical rivalry between India and China in Nepal. India's power purchase policy 2018 is considered as a

threat because exporting all hydroelectricity products to India deprives Nepali economy [23]. The Chinese companies in-

vesting in hydroelectricity projects of Nepa are withdrawing because of market and investment uncertainty [24].



Note. Nepali Times, by Ramesh Kumar, 2024. Copyright 2025 Nepali Times.

Figure 1. Existing and proposed Indian investment in hydropower in Nepal.

Ramesh Kumar (2024) mentions the geopolitical tension in Upper Arun Hydropower projects regarding the investment of World Bank. The World Bank initially agreed to invest as a primary financier in the project and it communicated with China and India. Though China gave green signal to World Bank, India showed its reluctance on the investment of World Bank [17].

Prashant Khadka (2025) states that India wants its involvement in Upper Arun because of the Indian investment in downstream projects of the same river. The World Bank delayed the decision of investment in Upper Arun because of India's reservation. The Government of Nepal has decided to conduct the project with domestic financing [13].

Samragyi Karki (2024) states that the power purchase policy 2018 has provided India leverage in the hydroelectricity of Nepal and constrained Chinese investment [14]. As a result, China withdrew from six hydroelectricity projects of Nepal. India gets four projects previously owned by China and outnumbered China double in size owning 10 mega projects whereas China is limited to five projects only. Shereena Qazi (2022) mentions the 1200 MW Budhi Gandaki project was twice awarded to China is finally given to India [30].

Saeed Ahmed (2025) highlights the unilateral suspension of Indus Water Treaty as a part of assertive foreign policy of India (also defined as 'Doval Doctrine') which has reshaped the architecture of south Asian security and politics. As a regional power and emerging global economic and military power, the adaptation of offensive realism in Doval Doctrine is particularly targeted towards the perceived threat originat-

ing from Pakistan. The unilateral suspension of IWT also weaponized water resource in south Asian geopolitics [3].

Davidson & Hawkins (2025) state the support by providing fighter jets and strategic military information to Pakistan in a four-day military conflict with India after Phalgam terror attack had added more complexities in diplomatic and security dynamism of south Asia. Ahsan Qazi (2025) views that India suspended the Indus Water Treaty with Pakistan and opened energy front as a new sphere of conflict.

3.3. Policy Review

Prithivi Man Shrestha (2022) mentions that the revised power purchase policy 2018 of India is aimed to prevent the purchase of electricity which India doesn't have power agreement. The revised policy demoralized Chinese investor in the hydroelectricity projects of Nepal because there is no power agreement between India and China at the present. Yuen (2021) states that China passed the Implementation Plan of WRDS (Western Region Development Strategy) in June 2021 which was officially launched in 2000 with motto 'Go West'. The main objective of WRDS is to mitigate the regional population imbalance and inequalities on the infrastructure development between east and the west [39].

The cabinet meeting of Nepal held on 31st Dec 2025 approved 'Energy Development Roadmap-2081' proposed by Ministry of Energy, Water Resources and Irrigation which present the road map for the generation of 28,500 MW hydroelectricity by 2035 among which 10,000 MW is planned to

export to India and 5,000 MW to Bangladesh and other countries through BBIN and BIMSTEC grid. The roadmap covers the present status of hydropower of Nepal, investment for the generation of targeted hydropower by 2035, analysis of demand and supply of hydroelectricity, domestic consumption strategy, inter-state transmission lines, and challenges on achieving desired target [19].

The key policies on energy security of the Government of Nepal are Nationally Determined Contribution 2021-2030, 15th Five-Year Plan, 16th Five-Year Plan, National Adaptation Plan 2021-2050, Ministry of Energy, Water Resources, and Irrigation - White Paper 2075, Energy Sector Vision 2050, Hydropower Development Policy -2001, Renewable Energy Subsidy Policy - 2073 B. S., National Energy Efficiency Strategy-2075 B. S., Environment Friendly Vehicle and Transport Policy – 2014, Medium Term Expenditure Framework (FY 2080/81-2082/83), Rural Energy Policy – 2006, Energy Development Roadmap-2081 B. S. The various plans and policies introduced by Government of Nepal particularly focuses on increasing the generation of hydroelectricity, construction of transmission lines and reduction the use of fossil fuel energy. However, a tangible gap is observed on the existing policies regarding energy security.

3.4. Research Gap

Government of Nepal has issued several policies and strategies regarding hydroelectricity however it lacks viable energy security policy to deal with the present political and security dynamism. The global climate change issue, energy centric conflict between India, Pakistan and China, Indo-Pak military conflict in May 2025, Sino-India unsettled border dispute and dispute over Arunachal province has reshaped the south Asian political and security dynamism. The scholars have focused the involvement of India and China in energy sector of Nepal whereas it is essential to analyze the shift of Sino-Indian geopolitical rivalry towards the water resources of Nepal. The policy review of the literatures shows that the existing policy on the energy sector of Nepal is particularly focused on the increment of the production whereas the monopolization of a foreign nation on Nepal's water resources weakens the energy security and finally national security of Nepal.

4. Result and Discussion

4.1. Changing Context and New Tension

After the end of World War II, the cold war between USA and Soviet Union was observed from 1950-1989 in global balance of power. The fall of Soviet Union has changed the world balance of power and shifted from bipolar to unipolar world led by USA which enjoyed its global hegemony till 2008. The global balance of power is shifted towards complex multipolar world and various actors are emerged in global

politics which has impacted the international as well as regional political and security dynamism [5]. The global security dynamism is characterized more complex because of the presence of traditional threats and non-traditional threats, non-linear threats, proxy wars openly supported by big powers against each other, interlinked digital and technological connectivity challenges, expansion of war domain to cyber and space, emergence of non-state actors as key player in international politics and security, use of artificial intelligence in wars, arms race, drone warfare, humanitarian crises, climate change, pandemics, terrorism, organized crimes and most importantly the possibility of tactical nuclear warfare [4]. The security of Tibet due to free Tibet movement and anti-China activities organized by Tibetan refugees sheltering in Nepal in support of international organizations and western nations is the main security concern of China over Nepal. Similarly, the cross-border terrorist activities operated through open and porous Indo-Nepal border, and Chinese investment in the plain region of Nepal are the major security concerns of India over Nepal. A four-day military conflict between India and Pakistan held in May 2025 has changed the regional security dynamism centering towards water resources after the suspension of Indus Water Treaty by India. The regional conflict centered on water resource will have direct impact on the water resource of Nepal (retired Nepali Army Major General Purna Bahadur Silwal, Personal Communication, July 30, 2025).

The ongoing Russia-Ukraine war since 2022, the Israel-Iran war 2025, Israel-Hamas ongoing conflict and Israeli military operations against Palestine, Lebanon, Syria and Yemen since 2023, India-Pakistan military conflict 2025, India-China military stand-off in Himalayan frontier in 2020, the probable military confrontation between China and Taiwan has directly impacted the security dynamics through the forming of new military, economic and technological alliances among the nations. The formation of quadrilateral dialogue targeted to contain China in pacific, expansion of BRICS, deteriorating relationship between USA and Europe, trade and tariff war between USA and other trading partners, cyber and drone warfare, space as new war domain have added more complexity in the security dynamics in the present global and regional security. The interlinkage between the security and digital technology rooted in socio-economic and political context has added more complexity in the present security dynamism.

The India-China stand-off in Doklam in 2017, similarly, India-China border skirmishes in 2020 and 2022, India's involvement in Quadrilateral dialogue group to contain China, sedentary regional organization-SAARC and emergence of BIMSTEC and BBIN, tension between two nuclear power India and Pakistan, cyber and cross border terrorism, climate changes induced natural disaster, low per capita purchasing power and religious polarization in south Asia has made the regional security dynamics more complicated. The test of new J-10C fighters and drones supported by friendly and neigh-

boring nations to Pakistan in a four-day India-Pakistan military conflict has added more military and diplomatic complexity in south Asian security dynamics [8].

After Phalgam terror attack India declared the suspension of Indus Water Treaty (IWT) on 23 April 2025 which has opened another front (Energy Front) on the ongoing conflict between India and Pakistan [29]. China started the construction of world's largest dam for hydropower in Yarlung Tsangpo (Brahmaputra) river which has raised fears and grave concerns of lower riparian nations India and Bangladesh [37]. The huge requirement of renewable energy for growing industrialization and necessity of water resources to highly populated China and south Asian nations India, Pakistan and Bangladesh, and surfaced disagreements and conflicts regarding water resources has paved the path for conflict in south Asia including China in the near future. The conflicts on water resources have added more complexities on south Asian geopolitics which has also shifted security dynamics of south Asia. Water resource and renewable energy have emerged as a new tension in south Asian geopolitics which is not going to be contained within south Asia but it will also drag China into the theatre of conflict.

A four-day military conflict between India and Pakistan from 7th May to 10th May 2025 flared after the terrorist attack in Pahalgam on 22nd April also shifted towards energy conflict after India announced the suspension of Indus Water Treaty 1960 [18]. On 11 August 2025, Pakistani Army Chief blamed India for creating instability in the region, he also threatened to destroy any dam by missile to be constructed by India in Indus River [15]. On 15 August 2025, on the occasion of 79th Independence Day of India, PM Narendra Modi announced from Red Fort the allocation of huge budget for National Deep Water Exploration Mission and he also states.

“Bharat has now decided—blood and water will not flow together. The people of the country now fully understand how unjust and one-sided the Indus Waters Treaty has been. The waters of rivers originating from Bharat are irrigating the fields of our enemies, while the farmers and the soil of our own nation remain thirsty. This was an agreement that has caused unimaginable loss to our farmers for the past seven decades. Now, the water that rightfully belongs to Bharat will be reserved solely for Bharat, solely for the farmers of Bharat. The form of the Indus Agreement that Bharat has endured for decades will not be tolerated any longer. This agreement is unacceptable to us in the interest of our farmers, and in the interest of the nation” [28].

The India-Pakistan tension steering towards the energy sector in south Asia. China's 'Go West Strategy' and its desire to fulfill the energy requirement of its rapidly developing western provinces through strategic investment in infrastructures and hydropower projects in Nepal which irks India [31]. The recent India-Pakistan military conflict 2025, the suspension of Indus Water Treaty by India 2025, construction of world's largest hydropower dam in Yarlung Tsangpo (Brahmaputra) 2025, the shift in geopolitical rivalry between

India and China in Nepal from connectivity to security and then to energy has pushed Nepal towards new security dynamism for which Nepal needs a viable energy security strategy to address the energy focused geopolitical rivalry between two emerging Asian powers India and China.

The global climate change has impacted on the livelihood of the huge south Asian population depended on the fresh water from the Himalayan glaciers. The carbon emission policy provisioned by international pact has shaped regional politics; India, Pakistan and China centered their effort for renewable energy which intensified the geopolitical significance of Kashmir because of its huge water resources. Similarly, the suspension of IWT by India, construction of hydropower dam in Brahmaputra river, the withdrawal of Chinese investors from various hydro projects of Nepal after the implementation of India's power purchase policy 2018, India's increasing leverages on Nepal's water resources, and Nepal's political instability and weak administration forced Nepal to accept the big actors' leverages orchestrated in the regional political and security dynamism. The analysis for the Alexander E. Wendt's 'Agent-Structure problem in International Relation' perspective proves that small actor (Nepal) is left with limited options to accept the conditions set by big actors (India and China) in regional political structure.

4.2. Energy Security of Nepal

In 1954 Nepal and India signed a transboundary Koshi agreement to construct the bridge in the Nepali territory to control the flood caused by Koshi river in India and Nepal. Nepali land was leased for 199 years to India with the management and control of barrage, and Nepal is authorized to get 10% of the electricity produced from the dam [9]. Dixit & Shukla (2017) also highlights the questions raised by the Nepali political parties and citizens regarding the unequal provision of benefit sharing in another trans-boundary Gandak River agreement between Nepal and India signed in 1959 [10]. Analyzing from Mark Zeitoun & Jeroen Warner's hydro-hegemony theoretical framework, India as a regional power has gained more benefits in the transboundary river agreement with Nepal.

Nepal can achieve energy security through the adequate production of hydroelectricity, promotion of clean energy, and securing markets in neighboring nations promoting cross border electricity transmission [1]. The Energy Sector Synopsis Report 2024 shows that the consumption of traditional energy is 63.87%, commercial energy is 33.03% and renewable energy is 3.1%. It also shows that the consumption of coal and petroleum products are decreased by 41.50% and 16.14% respectively whereas the electricity consumption is increased by 21.18%. The sales of electricity in domestic market are reached to 9,358 GWh and in foreign market (India) to 1,346 GWh. 98% of the population have an access to electricity [35]. Nepal still largely depends on the import of fossil fuels to fulfil its energy requirement and Nepal is not able to

achieve oil security, electricity security and natural gas security because of insufficient production of electricity and unsuccessful to replace the use of fossil fuel energy by hydroelectricity [27].

The regional security dynamics and geopolitics of energy should be centered on the formation of policies regarding the energy security. The changed security dynamics of south Asia after a four-day India-Pakistan conflict in May 2025, declaration of India and China for their independence on energy security through reducing their dependence on imported fossil fuel energy, India's suspension of Indus Water treaty, and construction of hydropower dam in Bramhaputra river by China have centered the geopolitics of south Asia towards water resources and hydroelectricity. Nepal as a geographically small in size and land locked nation lying between two big nations India and China is also a nuclear locked nation which is not only geographically sandwiched but also culturally sandwiched between two different civilizations and two different political systems. Therefore, the regional security dynamics, and geopolitics of water resources and energy between India and China should be incorporated on energy security strategy of Nepal. It should be linked to economic security and national security. The energy security of Nepal doesn't only limit to the uninterrupted energy at affordable price. As a hydro potential nation, it should be able to encourage national investors and attract foreign direct investment on hydropower projects preventing the monopolization over hydropower and water resources of Nepal. Most importantly, it also seeks the market security for its hydroelectricity in neighboring nations at negotiable price without compromising economic interest.

4.3. Evaluation on Nepal's Adoption Strategy

Nepal has issued various policies and strategies to promote the energy security of Nepal which are focused on the production, distribution and cross-border transmission to secure international market. However, a clear gap is visible on the consideration of regional security dynamics and geopolitical rivalry between India and China in the water resources of Nepal. The shift of the geopolitical importance from connectivity to security and then to energy should be incorporated into the existing policies and strategies. The 'Energy Development Roadmap 2081' chapter 5.2 mentions inter-state transmission lines between India and Nepal, and conceptualized the transmission line into BBIN and BIMSTEC through regional connectivity, whereas it is silence on the development of transmission line to China except 220 kV Rasuwagadhi-Kerung transmission line. Similarly, the power purchase policy revised by India in 2018 has severely impacted the investment in the hydropower projects of Nepal. It has demoralized the Chinese investors to invest in hydropower projects of Nepal because there is no bilateral power agreement between India and China. This policy has also paved the path of dependence of Nepal to India rather than

interdependence. Nepal seems weak on the energy negotiation with India which has kept India in upper hand in the water resources of Nepal. Nepal lacks counter strategy to tackle the India's revised power purchase policy 2018. The present policies and strategies also seem dormant on taking an opportunity from 'Go West Campaign' of China because of no transmission lines between Nepal and China exists at present and there is only one 20 kV transmission lines planned in the future.

4.4. Energy Security Policy

However, Government of Nepal has issued several policies and strategies regarding hydroelectricity, it is essential to address the regional security dynamics after India-Pakistan conflict of 2025 and the rivalry between India and China centering water resources of Nepal. The regional conflict between India and Pakistan regarding Indus water, tussle between India and China regarding the construction of hydroelectricity dam in Bramhaputra and its impact on the energy security of Nepal should be assessed geopolitically. The present energy security policy should be able to address the ongoing rivalry and regional security dynamism focusing water resources. Nepal's energy security policy should not be limited to only the interrupted energy at affordable price; it should focus on guaranteeing the security of energy market in neighboring nations having upper hand of Nepal. The energy security policy should fulfill the economic interest and national security of Nepal and Nepal should adopt the following strategies in the energy security policy of Nepal. Nepal's energy security policy should incorporate Cherp & Jewell's Vital Energy System (VES) approach and identify clearly what is the energy security threat, and who poses the threat for the energy security of Nepal.

4.4.1. Maximizing Domestic Consumption of Hydroelectricity

The sources of energy to be used in Nepal is categorized into three categories: traditional energy which fulfills 63.87%, commercial energy supplies 33.03% and renewable energy supplies 3.1% in F/Y 2079/80. The electricity consumption is increased by 21.18% and the domestic sales of electricity reached to 9,358 GWh and exports to India reached to 1,346 GWh. The 98% of the population of Nepal has access to electricity. The hydroelectricity energy consumption has been increased from 369 PJ (F/Y 2068-69) to 640 PJ (F/Y 2078-79). The major consumption sectors are residential and industrial which consumes 69.59% and 22.17% respectively, whereas transportation sector consumes only 10.49%, and agriculture sector 0.94%, commercial sector 4.79% and construction and mining sector 1.02% in F/Y 2078-79 [34]. The National Census Report 2021 shows that about 44.3% population uses LPG whereas only 0.5% population uses electricity for cooking purpose. On the other, the import of petroleum product is increased by 7.5% in the first 10 months of current F/Y 2024-25

worth Rs. 233 billion [21]. Nepal has been spending huge amount to import petroleum products which has intensified trade deficit to Nepal. Similarly, the transportation sector has been consuming only 10.49% of the electricity which is a negligible amount to huge hydro potential nation. The transformation from fossil fuel energy to clean hydroelectricity is essential to maximize the electricity consumption in the transportation sector. The consumption of hydroelectricity in commercial sector and construction and mining sector is also negligible which are the potential sector of hydroelectricity to reduce the consumption of imported fossil fuels. Government of Nepal should adopt the policy of reducing the import and consumption of fossil fuels replacing it by hydroelectricity.

4.4.2. Reduction of the Import of Fossil Fuels

In the F/Y 2023-24 Nepal imported petroleum products of worth Rs 1.592 trillion which is 18.87% of the total import of the nation [22], which is raised by 7.5% in the first ten months of F/Y 2024-25. The data shows that Nepal has been spending huge amount on importing petroleum products which is also a major cause of trade deficit on the foreign trade of Nepal. No petroleum production has been started in Nepal and Nepal imports all its petroleum products from India using oil tankers and Motihari-Amalekhgunj pipelines. A price list is received from India in every fifteen days and the price of petroleum products in Nepal is determined as per automatic price system [25]. The unavailability of fossil fuels in Nepal, lack of storage capability, and the complete dependence of Nepal over India in petroleum products always risks oil security of Nepal. The interruption on the supplies of petroleum products, the complete dependence over India, and lack of alternatives for the import of petroleum products always threatens the energy security, economic interest and national security of Nepal. The reduction of the import of petroleum products and its consumption is prime energy security concern of Nepal. Therefore, the hydroelectricity should replace the fossil fuel energy. The maximum consumption of fossil fuels in transportation sector should be gradually transformed to hydroelectricity which will open domestic market for the hydroelectricity produced in Nepal. 'Environment Friendly Vehicle and Transport Policy – 2014' aims to reduce the import of fossil fuels from India and promote environment friendly vehicles.

4.4.3. Prevention of Foreign Monopolization on Hydropower of Nepal

India has been gaining wide-range monopolization on the supply of petroleum products to Nepal. Nepal lacks alternative sources for the supplies of petroleum in normal situation and Nepal do not have sufficient storage capability for petroleum products. India do not only monopolize the supply of the petroleum products to Nepal; it also monopolized the price determination as well. Nepal do not have any option rather than to accept the price list send by India in every fifteen days.

On the other, Nepal cannot determine the price of electricity which it exports to Nepal, even Nepal is not in the position to export surplus energy according to its plan. Nepal needs to take approval from India to export surplus electricity to India. On 12 August 2025, India approved for the export of additional 200 MW electricity to India [32]. Nepal do not have leverage to determine the price and quantity of the electricity to be exported to India. The power purchase policy 2018 of India has jeopardized the Chinese investment in the hydropower projects of Nepal. India gained geopolitical victory on the rivalry on water resources of Nepal which has adversely affected the economic interest of Nepal. Nepal has been highly prioritizing the electricity transmission lines with India. However, Nepal lacks transmission lines with China and only one 220 kV transmission line is agreed to construct between Nepal and China. The demoralization of Chinese investors to invest in the hydropower projects of Nepal, India's strategic possession on investment on the hydropower projects of Nepal and preventing China to invest in Nepal, India's domination on the price determination and export quantity has been paving the path for Indian monopolization on the hydroelectricity and water resources of Nepal. The previous trans boundary river agreements (Koshi Agreement and Gandak Agreement) between Nepal and India had provided more benefits to India with the full control and management of the barrages.

The complete dependency on the export of hydroelectricity on India will be disastrous for the national security and national interest of Nepal. There is great possibility to waste out the hydroelectricity of Nepal if India denied to import electricity from Nepal due to any political, social, economic or geopolitical causes. It is not wise to put all eggs on one basket. Therefore, it is necessary to diversify the foreign hydroelectricity markets of Nepal through the construction of new transmission line between Nepal and China. Nepal should be able to grab the opportunity of China's 'Go West Strategy' and target to supply the hydroelectricity required for the emerging western regions of China. Though, Nepal signed an agreement with Bangladesh for the supply of 40 MW hydroelectricity, and planned to extend up to BBIN and BIMSTEC region Nepal's hydroelectricity should be transmitted through the transmission line of India which keeps India in dominant position on the energy security of Nepal. The Indian monopolization on petroleum product over Nepal and Indian dominance on the hydroelectricity and water resources of Nepal will directly threaten the energy security, economic security, and finally national sovereignty of Nepal.

4.4.4. Involvement of National Security Council

The Constitution of Nepal 2015 article 266 and 267 have provisioned National Security Council (NSC) and it recommends the Government of Nepal related to national security and national interests. Energy is considered as a strategic element therefore energy security is associated to the national security of the nation. The National Security Council Secre-

tariat (NSCS) should play an active role on the coordination of different stakeholders to be involved on the hydropower projects from the beginning to the end of the projects. Additionally, all draft agreements related to the energy security to be done with foreign nations should be reviewed from the perspective of national security by National Security Council. The Government of Nepal should formulate energy security policy and hydroelectricity security strategies in close coordination with Ministry of Energy, Water Resources and irrigation, National Planning Commission and National Security Council.

5. Conclusion

Analyzing through the agent-structure relationship between Nepal and her big neighbors India and China in regional structural context it shows that the actions of big actors like India and China influences the actions of structures and the small actor like Nepal. In fact, small actor does not pose any power to influence the other actors and structures, and small actors like Nepal are helpless on the agent-structure relationship and no option to accept the structural decisions of big actors. The weak internal politics characterized by political instability, ineffective governance, corruption, political and social polarization, and weak economic foundations has declined Nepal's diplomatic power to deal with big actors India and China. The hydro hegemony theoretical framework of Mark Zeitoun & Jeroen Warner is considered to analyze trans boundary river agreement between Nepal and India where Nepal is not found equally benefitted. The industrialization process of India and China is rapidly growing as a factory of the world. The industrial and economic growth cannot be sustained without clean energy in the future. Therefore, energy thirst rivaling nations; India and China eyeing on an unexplored huge water resource of Nepal. The suspension of Indus Water Treaty by India and construction of hydroelectricity dam in Yarlung Tsangpo (Brahmaputra) has centered the energy geopolitics in Indian sub-continent. The monopolization of India on the supplies of petroleum products has threatened oil security of Nepal and increasing Indian monopolization on the hydropower projects and water resources of Nepal has challenged Nepal's energy security which is more likely to impact economic security and national interest of Nepal. The prevention of monopolization of foreign nation on the energy sector through the diversification of energy markets should be the prime concern of Nepal at present. The energy security policy and hydroelectricity strategies should be formulated in coordination of all stakeholders including National Security Council.

Abbreviations

BBIN	Bangladesh, Bhutan, India, Nepal
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral

BRICS	Technical and Economic Cooperation
IEA	Brazil, Russia, India, China, South Africa
IWT	International Energy Agency
NSC	Indus Water Treaty
NSCS	National Security Council
SAARC	National Security Council Secretariat
VES	South Asian Association for Regional Cooperation
WEC	Vital Energy System
WRDS	World Energy Council
	Western Region Development Strategy

Author Contributions

Madhav Thapa is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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