Journal of Political Studies
Vol. 28, No. 1, January–June, Summer 2021, pp. 133–156

Contemporary Ecological Paradigms and Emerging Challenges of Water Security Nexus for Pakistan

Asma Siddique
Ph. D (IR) scholar,
Department of Political Science,
University of the Punjab, Lahore.
Correspondence: asma.siddique.pk@gmail.com

ABSTRACT

Water Securitization is key hindrance to socio-economic and human development for a water-based economy. The trajectory relations among states, hydrological vulnerabilities, multi-faced water meagerness with crucial water sharing challenges are prompting geo-strategic and geo-political arduousness in South Asia. The chief intension of research is to elaborate the eminence of extreme water belligerences related with traditional state security concerns predominantly in case of Pakistan and India which are co-basin rival states of Indus Rivers System. Pakistan being single basin and lower riparian is profoundly reliant on Indus Basin (a lifeline for the country) due to its agrarian economy. The ever-increasing gap between demand and supply is instigating water scarceness, possessing numerous domestic aspects, political and climatic factors, Indian hydro-hegemonic intensions, etc. The ideology of water securitization along with national security is toxic in body politics, ensuing hydrological security complexes, security dilemmas and sufferer anxiety syndrome for Pakistan, elaborated by Securitization Theory paradigms. The research is based on descriptive and deductive reasoning approaches, mixed research methodology and utilization of secondary data resources. There is a dire need of dynamic responses, establishment of operative institutions, mutual cooperation at all levels, with de-securitization of riparian and hydrological security discourses can be valued, if not then it could intensify the human, national and hydro-security challenges for concerning states.

Keywords: *Water Securitization, Sufferer Anxiety Syndrome, Ecological Fluctuations, Human Security, Hydro-hegemony, Hydrological Security Complexes (HSC).*

Introduction

Water is precious commodity for humans and its vitality could not be denied for the survival of biotic life on planet earth. Although, enormous amount of water (app. 97%) is available on the globe but having only 2.97% of fresh water out of which just 0.03% is accessible for the use of more than 7 billion populations (BBC, 2011). At the same time, the annual addition of 80 million people is posing further pressure on the existing static resources of fresh water. The founding chairman of Global Water Partnership, Ismail Serageldin ominously cautioned in 1995, "…. If wars of this century were fought over oil, the wars of the next century will be fought over

water, unless we change our approach to managing this precious and vital resource" (Otis, 2002). The successive UN secretaries general also made the calamitous predictions such as Kofi Annan in 2001 stated: "…fierce competition for fresh water may well become a source of conflict and wars in future"[1] (Wolf, Carius & Dabelko, 2004). Similarly, Ban Ki-Moon in 2008 said, "A shortage of water resources could spell increased conflicts in the future. Population growth will make the problem worse. Same is true about the climate change. As, the global economy grows, so will its thirst. Many more conflicts lie just over the horizon" (Deen, 2008). These statements make sense that in future the sharing of water resources can be a source of armed conflicts among states.

In this contemporary era, though the entire globe is under severe water stress due to increased demand of water and decline in its supply, hence the more serious resentment on the sharing of transboundary water resources is in South Asian region (i.e. a home to one fourth or 24.81% of world's population nearly 1.9 billion) between the two arch rival states of Pakistan and India since from the partition of Sub-continent in 1947, which can lead to the first water-war of the century. According to UNDP report, the availability of water has been declined from 2,172 m^3 to 1,306 m^3 per capita in Pakistan till 2015, even 27.2 million people are unable to have access of safe water (UNDP, 2017). Numerous aspects such as unjust partition of Punjab Province by Radcliffe, environmental anomalies, rapid economic growth, mismanagement and maladministration of water reservoirs, corruption, swift rise in population, Indian hydro-hegemonic ambitions, pollution of rivers and aquifers, Kashmir issue, prompt urbanization and industrialization, etc. are the key fault lines which are resulting in the huge gap between the water demand and supply and also the depletion of water reserves in Pakistan.

The paper censoriously analyzes the premise of Water Securitization nexus, precisely with focus on Pakistan's water crisis allied with emerging national, human and food security discourses, composed with dynamics of domestic, inter and intra-states and regional hydro-politics in highly war prone region of South Asia. This paper further argues about the regional vulnerability to water war and together with other fault lines the swift ecological anomalies are further spiraling out the water scarceness in the region. The previously mounted treaty (Indus Water Treaty) is lacking the competence of dispute resolution, although it sailed smoothly in hard times between Indo-Pak during about last six decades. Hence, now the water issue has become sweltering point in bilateral relations by the practice of water as a tool by India for exploiting and intimidating Pakistan.

The two key premises of the research are: firstly, although the entire globe is undergoing the apprehensions of freshwater rarity but at the same time most of the states are anticipating towards water resources development for their societies. Pakistan is still focusing fewer on Integrated Water Resources Management and extra on dispute settlement with India. Secondly, the diminishing of water reserves, outstripped gap of water demand-supply triggered mainly by hydro-politics, hydro-hegemony and climate change and the accomplishment of public's hydel demands

[1] On March 1, 2001, this statement was made by Kofi Annan during his speech at the 97th annual meeting of Association of American Geographers, got famous as for the first time, the world's leaders brought the concerns of environmental security, water scarcity and climate change on front.

on the cost of other state could snowball the hydrological apprehensions into state's security alarms, with a chain of infinite domino-effect, even upsurge the probabilities of water war between rival nuclear states of Indo-Pak.

British Irrigational Expansion and Provisional Resentment

According to experts, the history of Indus River is as old as civilization in the region about five thousand years old since form Mohenjo-Daro and Harappa to Mughals. They instigated with inundation canals, hence moved to the perennial canals and utilized them for irrigation purposes. Primarily, Great Britain started canal system development on river Sutlej and Jumna after 1819, hence western Jumna canals were compelled to developed after the famine of Agra in 1837-38 (Hussain, 2017). The annexation of Sindh and Punjab in 1843 and 1849 respectively, resulted in greater magnitude for developing canal colonies of Lyallpur and Montgomery and Sukkur barrage in 1932 (Haines, 2017). British had no experience of irrigation system and were familiar with only Egyptian irrigation. Hence, they got the assistance of engineers from France, Italy, Northwest Africa and Spain, also borrowed irrigational techniques from Mediterranean and Middle East to develop the Indus Basin irrigation system which became the world's most extensive and prevalent irrigation system (Michel, 1967). However, this development was without proper policy, never developed as Integrated River Basin, emphasized only on the cost-benefit factors rather than other vital considerations and gave priority to Punjab that posed far-reaching consequences on the economic and political relations of Punjab and Sindh which are felt till today.

As, Sandhi's being on receiving end believed that British rewarded Punjab's ruling elites for their super-loyalty to empire. In early 20th century, British launched an extensive irrigation system on all Punjab Rivers except Beas which made Punjab the "Breadbasket" of northern India. On the other hand, construction of dams and perennial canals system was completely ignored in Sindh on the logic of paucity of time and machinery and the water was ultimately wasted by ending up in sea (Gilamrtin, 1994). Thus, the water dispute of Indus Rivers between Punjab and Sindh was inherited in physical geography to Pakistan with the partition plan of Sub-continent. This sowed seed of water crisis for the nascent states, prompted in a less than one-year duration after independence when India blocked Pakistan water, subsequently gave rise to water dispute between arch rival states.

Hydrological Aversion and Indian Belligerences

The hasty division (in just 71 days) lead to the creation of Pakistan and India with three key and deep-rooted issues of Water Sharing, Kashmir and Siachen Glacier, which are aligned strategically. The unfair partition of Punjab by Cyril Radcliffe (the head of Punjab Boundary Commission Award), resulted in the allocation of Ferozpur and Madhopur headworks on Sutlej and Ravi Rivers to India. Consequently, this amazed Muslims and their leadership, as Pakistan which could be the upper riparian to India, unfortunately became the lower riparian of Indus Rivers System (IRS) (Cheema, 2000). With the expiration of Standstill Agreement on 31 March, 1948, India blocked the water flow in 11 canals of West Punjab on the very next day, without engaging Pakistan into negotiations or by giving any prior notice. On 4 May 1948, after extended dialogue India finally restored water flow but with the demand of proprietary rights on Eastern Rivers. An agreement known

as Delhi Agreement (also known The Document, The Joint Statement or Inter-Dominion Agreement) was signed to restore Pakistan's water flow (Vajpeyi, 2014).

Although, the negotiations protracted till 1952, but all in vain as India again stopped the water flow in 1952 and 1958, which could even spark a war. This extreme conflictual situation stimulated ex-chairman of Tenessee Valley Authority (TVA), David Lilienthal,[2]who after visiting Indo-Pak on February 1951, draw world's attention towards the momentous threats posed by these adversaries to international peace, advocated the involvement of international community to find an appropriate resolution and proposed Integrated Management of Indus Basin System that should be design, develop, built and operate as seven-state TVA system in US (Byrnes, 1992). A friend of Lilienthal and ex-President of World Bank, Eugen Black offered his and institutional services to mediate between Indo-Pak. Initially, with trilateral players' efforts both states signed a Memorandum of Understanding (MoU) on 10 March 1952, for uninterrupted and continuous flow of water for Pakistan before reaching a solid pact. Hence, there remained deadlock in talks, as the proposed plans were rejected by Pakistan in 1954 and 1958 on technical grounds (Haines, 2017).

With active assistance of World Bank and Eugen's personal efforts, after the eight years prolonged negotiations, the two countries signed Indus Water Treaty (IWT) on 19 September 1960, allocating the proprietary rights to India on Eastern Rivers (Ravi, Sutlej and Beas) and almost the same to Pakistan on Western Rivers (Chenab, Indus and Jhelum), while US along with donor states established Indus Basin Development Fund of $893.5 million (Graves, 1973). Primarily, both Pakistan and India were reluctant to accept the Bank's proposal as Pakistan was aiming to go to UN Security Council for water issue and India was in the mind that Pakistan being closer to US might get extra favor during negotiations via World Bank. But that was just a wishful thinking and at the most crucial point of rivers' allocation, India got favors unabashedly while Pakistan was betrayed (Salman & Uprety, 2002). India was also favored to use the water of Western Rivers under certain conditions; hence Pakistan was not offered any such kindness.

The treaty was indeed a marvelous attempt to resolve the water dispute and to extract the concerning states from that predicament situation. The signing of the treaty fashioned the expectation that it would resolve the water issue between Indo-Pak permanently and it did so for the initial four decades as it didn't get any hole even during the wars of 1965,1971 and under numerous critical states of affairs (Iyer, 2005). Hence, the re-emergence of differences on water issue appeared in 1970s, with the instigation of copious infrastructure and hydro-electric power projects by India over the interpretation of several clauses of IWT, on the Western Rivers allocated to Pakistan.

Some of the most controversial projects are Salal Dam in 1970s on Chenab River in Reasi district of Indian Occupied Kashmir (IOK), in 1984 Wullar Barrage/ Tulbul Navigation Project on Jhelum River at Sopore in IOK, in 1992 Baglihar Hydro-electric Power Project on Chenab River in Doda district of IOK and in 1994 Kishanganga Hydro-electric Plant on Jhelum River in Bandipore of IOK. As, the

[2] David Lilienthal was former chairman of Tenessee Valley Authority (TVA), who wrote two articles in Collier's magazine one with the title, "Another Korea in the Making" and the other article was, "Are we Losing India".

result of failure of hectic bilateral dialogue and hydro-diplomacy, they have to involve the Court of Arbitration (CoA) and Neutral Expert (NE) for dispute resolution (Mehmood, 2018). Undoubtfully, plenty of issues were inadequately dealt in treaty as it is unable to fulfill the current water demands. The use of water by India as a weapon of political maneuvering is alarming, as a crude shock hit Pakistan in September, 2016 during the Kashmir's terrorist attack, when Indian PM Narendra Modi threatened as, "Blood and water cannot flow simultaneously" (India Today, 2016). This milieu is swiftly heading towards extreme water securitization and would ultimately lead to the food, human and national security discourses for Pakistan, compounding with the severe water conflicts.

Indus Rivers System, Tributaries and Indus River Plains (Industan)

The Indus Rivers System is contemplated as the world's largest irrigation system with a more than 12 million hectors irrigation capacity annually and covers the 20 million hectors area in total. Pakistan, China, Afghanistan and India are the four riparians of the Indus Basin, among which Pakistan has 75%, China 10%, India 7% and Afghanistan has only 8% catchment area of the basin (Siddique, 2010). The system having two main tributaries i.e. Indus River in Punjab Province of Pakistan with five more eastern tributaries and a main western tributary of Kabul River in Afghanistan with numerous small tributaries, while the quantum of water flow doesn't remain the same and varies annually and from season to season due to rainfall and the sow melting of Hindukush-Karakoram- Himalaya ranges (HKH) in the catchment areas.

Fig. (1) Indus Rivers System and Its Catchment Area

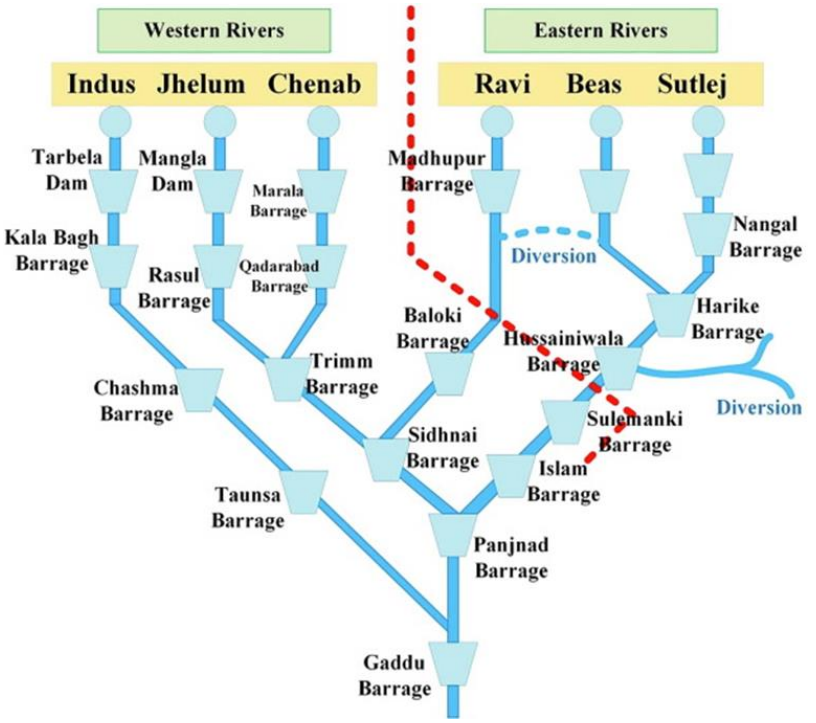
The Indus River is the key one and world's twelfth largest river having 32 tributaries, most of which lies in Pakistan (except the eastern tributaries which are

in India), among those the major are Jhelum, Chenab, Ravi, Sutlej and Beas which commands the plains of Punjab known as Punjnad Rivers. The other major tributary is River Kabul, originates from Afghanistan, joins Chitral or Kunhar River, Sawt, Bara and Kalpani Rivers in different zones of Pakistan and Afghanistan and then meet Indus River near Attock fort in Pakistan (Vajpeyi, 2014). Annually, the average water flow is 154 MAF, out of which 144.91 MAF is confined by western tributaries, 9.14 MAF to eastern rivers, 104.73 MAF consumed in farming, 9.9 MAF lost by evaporation, leakage and spills in flooding while 39.4 MAF passages to sea. Indus Basin irrigational system has 16 barrages, 2 headworks, 44 canals (2 in Baluchistan, 5 in KPK, 23 in Punjab and 14 in Sindh), 3 main reservoirs, 12 interlinked canals, 2 siphons across key rivers and over 107,000 water courses (PILDAT, 2011). This mighty river of South Asia originates from north of Kalish Range in China (Tibet), the catchment area of Indus River Plains (Industan) from Himalayan piedmont to Arabian Sea is about 518,000 km^2 or 200,000 square miles, which can be divided in the lower and upper regions. Indus River alone constitutes the lower region while Indus along with its tributaries makes the upper region and rejoins the Punjnad Rivers at MithanKot, hence towards southwards empties itself into Arabian Sea near Karachi. Indus Rivers has four key Doabs or areas (Naqvi, 2013), such as:

- Sindh Sagar or Thal Doab (between Indus and Jhelum Rivers)
- Chaj Doab (between Jehlum and Chenab Rivers)
- Rechna Doab (between Chenab and Ravi Rivers)
- Bari Doab (between Ravi and Sutlej Rivers)

The lands formed by the Indus Rivers has four kinds like Cover floodplains, Active floodplains, Meander floodplains and Scalloped Interfluves. They also constitute three deserts which are Thal, Cholistan and Tharparker Deserts, where wind not water shaped their topography. (Fairley, 1975). Thus, the diverse areas of Industan experience varied temperatures and rainfall spell from extreme to moderate both in summer and winter, however the climate change is adversely affecting the weather of this zone and resulting in change in the pattern and timespan of seasons, heavy rains and flooding or less rain with droughts, severe heatwaves, etc. posing devastating impacts on all biotic life.

Fig. (2) Structural Overview of Indus Rivers System



Pakistan's Agrarian Economy and Demand-Supply Gap

Pakistan has geo-political and geo-graphical significance and is one of the prominent countries of South-Asian region. It is an agricultural state whose water requirements are contingent on ground and surface water resources. The country has Indus Rivers System in north and north-west which is chief supplier of ground water while surface water is attained from snow-covered mountain ranges of HKH, monsoon's rain water and ice- melting from glaciers. Indeed, Indus Rivers System is the life line of the country's agrarian economy still with highest share in GDP. As, Lilienthal observed that the best growing areas of Pakistan's Western Punjab and Sindh (about 20 million acres) could be devasted in a week without water for irrigation along with the starvation of nearly ten million people. He also mentioned that just 20 % water of Indus Basin is being utilized for irrigation while the rest remains unused and went to Arabian Sea, (Graves Jr., 1973).

Around 90% of the cultivated land of country nearly 34.5 million acres, is heavily dependent on the continuous water supply from Indus Basin System (IBS), while 43% employment is relied on water sector by 2014 (UNDP, 2017). Hence, the outdated and aging irrigational system, orthodox cultivational practices, salinity, groundwater thinness, pollution and water logging are deactivating thousand acres of arid land annually. The country is facing the grave challenges of water dearth due to maladministration and mismanagement with malingering of water market and swiftly moving from water surplus to water stress country. The live storage capacity of Pakistan is 121 m^3 per person, just above than Ethiopia while US has largest with

6000m^3 per person. During last four decades, the extreme abstraction of water (increased from 25.6 MAF to 50.2 MAF) is resulting in lowering water table (42%-32%), which contributes about 47% to surface water for farming (UNDP, 2016).

Ever growing urbanization, rapid industrialization and population surge demands more water for cultivation, food, sanitation, hydro-power generation, industries, modern life style, energy consumption, etc. According to an estimate in 2010, South Asia has 1.68 billion population and if grows with same pace, then by 2040 it will reach 2.22 billion with 32% upsurge (Gareth, 2014). Contrary to this, the water storage capacity of Mangla and Tarbela dams has been dropped 33%, while siltation reduced the capacity of Chashma Mangla and Tarbela to 11.47 MAF by 2010, hence up to 2020 it will more condense to10.70 MAF (PILDAT, 2011). This emerging demand-supply gap further provoked by ecological variations is consequential for extreme water crisis in Pakistan. According to UNFAO (UN Food and Agriculture Organization) report in 2014, by the turn of 21st century the per capita per annum water availability for both Pakistan and India have dropped by 1,700 m^3 touching the water stress level, so as Afghanistan too in 2012. Nevertheless, the insufficiency of water can lead the region towards higher vulnerability of water securitization, food, human and national security apprehensions or could even drive the states to harmonize for apportionment of water.

IWT and Two Indian School of Thoughts

During recent years many voices have been raised in both states at official and unofficial level, against the IWT. As, Pakistan has particular apprehensions on treaty due to shortage and interruption of water supply being down streamer but why are Indians opposing? It is surprising, as India has Eastern Rivers with exclusive rights on Western Rivers and benefited more being the up streamer of IBS. However, the critical Indian approaches on the treaty can be classified into two main Schools of Thoughts.

1) B.G. Verghese's Thoughts
2) Ramaswamy Iyer's Thoughts

1) B.G. Verghese's Thoughts

First School of Thoughts believe that the treaty has several flaws and thus it demands considerable alterations in the existing text to meet the present and future water demands of both the states. B. G. Verghese[3] is the key advocate of this group and in favor of revision of treaty with Indus II on the basis of Indus I, focusing of article XII (Verghese, 2005). He believed that the upper reaches of the Western Rivers should be harnessed and surveyed by both Pakistan and India, also advocated for "joint construction, investment, control and management schemes", particularly if Pakistan is interested in hydro-electric projects, flood control and additional water storage.

[3] B. G. Verghese, the former editor of Hindustan Times and water expert at Centre for Policy Research in Delhi. He made an interesting debate in his article, "Water conflicts in South Asia," in *Studies in Conflict & Terrorism*, vol. 20, no. 2 (1997), related to the nature of IWT and Indus-II.

2) Ramaswamy Iyer's Thoughts

The Second School of Thoughts considers that the present circumstances require urgent jettisoned from the treaty and demands its replacement with a new and better one. This group is led by Ramaswamy Iyer[4], believed that the treaty is not a water-sharing and constructive while "a negative partitioning treaty concluding the partition of land", thus joint projects and mutual cooperation can't establish and requires a bilateral negotiation for a totally new treaty (Iyer, 2005). In Ramaswamy opinion, the first group overlooked the prominence of joint projects related to agriculture or electricity generation and the establishment of new relations on Indus Basin System between Indo-Pak, demands the negotiations on a totally new treaty, which could be stand on the pre-existing one.

Nevertheless, whatever the approach is, India aims to get rid of this treaty. The two key motives for India to revise the IWT may be that firstly India is swiftly touching the position of water-deficit country. As, according to the World Bank's report, the per capita water availability in India has been declined from 5000 m^3 in 1947 to 2000 m^3 in 1997, supposed to further drop till 1500 m^3 (or about 1000 m^3-800 m^3 per capita per annum) by 2025 annually, making it water-stressed state due to the increased demands of water for population and economy. The second motivation is that India intents to keep Pakistan under stress for security reasons using water as the most effective and less expensive tool by the construction of storage structures on Western Rivers which are the life-line for Pakistan (Khan, 2009). Although, this debate generally confined in unofficial or non-governmental circles (once governmental statement in 2001, after attacks on Indian Parliament) while Pakistan persisted quite aloof from it. Hence, the matter got undue importance and one-sided debate shouldn't bother until Delhi's government come in direct contact with Islamabad on the matter of revising the IWT.

The Issues Overlooked in IWT

The treaty is generally regarded as dealing more specifically with water sharing rights, obligations, control of water flow, construction of water infrastructures and surface water managing measures. Initially, it fulfilled the states' ambitions but some developments during the last few decades such as hasty urbanization, increased population pressure, pollution, mistrust between states, climate change, swift industrialization, economic growth, Indian hydro-hegemonic intensions, etc. are resulting in depletion of both surface and ground water resources in Pakistan. Thus, it is believed that the current scenario requires revisiting of IWT or a totally new one deal. Some issues disregarded in treaty are:

- The treaty ignores the measures related to ground-water issues and water abstraction from transboundary aquifers which are the sustainable and reliable water resources for agriculture.

[4] Ramaswamy Iyer, former secretary of India's water resources, leading writer on water matters also associated with Delhi's Centre for Policy Research. In his article "Indus Treaty: A Different View" in *Economic and Political Weekly*, July 16-22, 2005, declared IWT as "coda" of Indian Partition and rejected the idea of building new treaty on previous grounds.

- IWT remained inadequate to address the hydrological uncertainties and unpredictable variations in rivers' water flow driven by climatic fluctuations and ecological anomalies and the adaptations to avoid shared climatic threats (Mehmood, 2018).
- The treaty didn't focus on the maintenance of quality of water as the aquifers and Western rivers of Pakistan are being adversely polluted by India through the chemical pollutants from agricultural and industrial wastes and the domestic effluent from urban population near water bodies.
- Most of the upper reaches of Western Rivers and watersheds of Indus Basin System are in India and IOK. Deforestation, human activities and climate change is harmfully distressing watersheds and resulting soil erosion, sedimentation, landslides, etc. Poor management of watersheds is severely affecting both the water quality and quantity of Indus Rivers System.
- There is no mechanism prescribed in the treaty for water sharing in dry years. India can also draw water from western rivers, while Pakistan has to bear the full brunt of water shortages and became vulnerable in dry years.
- The treaty doesn't deal the Indus Basin as Integrated Unit, focused profoundly on water division and not on sharing of potential benefits, overlooked the increased water demand and depletion threats due to swift economic growth, urbanization, population rise, etc. (Mehmood, 2018).

Environmental Fluctuations in South Asia

South Asian region embraces key water sources: ground water, rainfall and three watering rivers collectively known as Indus-Ganga-Brahmaputra (IGB) System, having origin in Himalayas in Tibet Plateau of China's territory. Six states in region shares the water of IRS such as: Indus by Pakistan, China, Afghanistan and India, Ganges and Brahmaputra by Nepal, Bangladesh, Bhutan and India. Except China and Afghanistan, rest of co-basin states also signed treaties like IWT between Indo-Pak (1960), Ganges Treaty between Bangladesh and India (1996), Mahakali Treaty (1996), Kosi Treaty (1954) and Gandak Agreement (1959) between Nepal and India on Brahmaputra. These treaties sustained in stressed political conditions even during wars, predominantly IWT which applauded as a model treaty internationally as it endures the vicissitude of pivotal Indo-Pak relations. However, climate change is sternly affecting monsoon rains' spell, expanding of some Karakoram glaciers while shrinking of widely held Himalayan glaciers which are melting utmost abruptly in the world at 10-60 m annually (Morton, 2011). Consequently, such notable climate changes and global warming is triggering grave water supply anxieties for the regional states.

Genuineness of Climate Change

At the time of signing IWT in 1960, only few people were familiar with the notion of Climate Change but after the time span of more than five decades to treaty, the circumstances are moderately odd. According to some Indian analysists, the IWT should be rewritten or existing treaty should be replaced by a newer one, as certain quantum of water to flow in the Indus Rivers is undergoing a shift due to climate change. This issue demands to elucidate whether is the climate change real and is it affected the water flow of Indus Rivers System in Sub-continent? According to

Synthesis Report in 2007, on the effects of global climate change that in Asian Region the stress on the water resources exacerbate in 21st century due to climate change along with urbanization, population rise and economic growth. The major masses of glaciers from HKH and Andes might lose, resulting in the reduction of fresh water availability for population and economy (IPCC, 2007). The similar predictions were made by IPCC (Intergovernmental Panel on Climate Change) Working Group II on South Asia that the swift melting of ice from Himalaya's glaciers (i.e. faster than any other part of the globe) might result in their disappearing by 2035 or sooner. This could make Indus, Ganga, Brahmaputra and other rivers as seasonal and also affect the regional economy (Climate Change, 2007). Hence, the following report undergo severe criticism as it didn't provide any evidence to support it prophecies.

As, the KHK are often stated as the "Water Tower" of Asia with world's largest ice body of glaciers outside polar caps, feeds water to ten large rivers including Indus, Ganges and Brahmaputra and the lifeline of millions of people in South Asia. However, a research-based study on Himalaya by Dr. Walter Immerzeel (a Duch scientist), reveals that in 21st century, the water levels in rivers will rise due to reduction in glaciers' size due to ice-melting, along with the increased rains in monsoon which will increase water discharge and a good sign to deal with food and water security in Pakistan, Bangladesh and India. The glaciers melting will touch its optimum by 2070, subsequently dropping the glaciers discharge but at the same time increased precipitation will compensate it, leading to increased water discharge in rivers (Immerzeel, 2013). Nevertheless, whether the climate change is really affecting the glaciers' melting in KHK ranges, monsoon rains and the flow of water in Western Rivers, the data collected by WAPDA, given in the table below suggests a negative answer.

Table:(1) Water Flow in Western Rivers

Average (MAF)	Indus at Kalabagh	Jhelum at Mangla	Chenab at Merala	Total
Pre-Independ. (1922-47)	89.25	22.55	23.47	135.27
Pre-Treaty (1947-61)	94.26	24.24	29.18	147.68
Pre-Mangla (1961-67)	87.41	21.54	24.92	133.88
Pre-Terbela (1967-76)	83.57	21.31	23.72	128.60
Post-Terbela (1976-2010)	89.69	22.59	26.09	138.37
Long-Term (1922-2010)	89.51	22.64	25.51	137.66
Max.	120.09	32.74	35.13	186.79
Min.	63.19	11.89	17.85	97.16

Source: Pakistan Indus Water Commission

The above table indicates that during 1992-2010, the water flow in Western Rivers remained almost constant. The average water flow during 1976-2010, was 138.37 MAF while the years from 1982-2012 were declared the warmest 30 years by IPCC Synthesis Report in 2014. During 1922-61, the average flow stood at 135.27 MAF, when the climate change concept was not popular. Thus, the available date reveals that impacts of climate change on water discharge in Western Rivers are negligible

and the similar outcomes could be apply for the Eastern Rivers as they are also the part of Indus Basin (while their data is not approachable for Pakistanis). Hence, it doesn't signify that climate change would never endure the substantial transformation and the water flow in Indus Rivers will remain frozen in the future.

Therefore, the Indians are aiming at scampering the IWT which is definitely an unwise approach. As, it would demand decades long serious and hard-hitting dialogue with some third-party assistance and still might not be possible to reach an agreement particularly because of Indian hegemonic intensions and at present the circumstances are not like it were in 1960s for both Pakistan and India. Consequently, this could lead the both states towards disaster, political contention and even more perilous than Kashmir issue. So, to accomplish an Indus II might be the best course of action to regulate the water flow, which is undergoing fluctuations due to environmental anomalies, hence climate change is not the only source of acrimony between Indo-Pak.

Water Securitization and Its Major School of Thoughts

The water securitization has deep links with water-born conflicts and triggers volatile strains and antagonism among states in several regions of the globe. The different schools of thoughts which elaborates this co-relation can be categorized into four major groups, which are as follows:

1) Peter Gleick's Thoughts

The first group is based on Peter's work titled "Water and Conflict: Fresh Water Resources and International Security", elaborated that in 21st century the water and its supply systems can be a cause of war and military actions. To achieve economic and strategic dominance and political advantage, the water reservoirs can be used as offensive or defensive tool and the water depletion can be associate with national security and trigger fierce resentments among states (Gleick, 1993).

2) Tad Homer-Dixon Approach

This approach is rooted on Tad's various studies on environmental security, explored that climatic variations could prompt scarcity of water resources and pollution which can ignite the insurgencies, economic, civil, identity and social unrest and conflicts. The co-basin states predominantly tolerate conflictual relations especially when the water is being used as coercive tool by upper riparian or when lower riparian is stronger than upper. Thus, water depletion has potential for conflicts and in future it can exaggerates the inter-states discontent (Dixon, 1999).

3) Aaron Wolf Ideology

Aron contributed with the twin dimensions of conflict and cooperation on water sharing relations and gave the perspective that water scarcity could be a source of strains and cooperation among states by strong institutions building. To evaluate the positive and negative interactions among states during 1950-2000, he used the scale of -7 to +7 and concluded that water depletion mostly endorses positive interactions in the form of treaties while negative indicators of conflict are week (Wolf, Stahl & Macomber, 2003).

4) Nils Petter Gleditsch Approach

Nils carried out a large-*N* quantitative research work, to evaluate the above-mentioned thoughts, used several theories to assess the water wars' history and composed many articles. Firstly, he backed the Gleick and Homer-Dixon approach of relationship of conflicts and water scarcity, as co-basin states are more inclined to conflicts than simply contiguous ones. Secondly, focused on the boundary's length to check the conflictual water relations of contiguous states which were not fake. Thirdly, based on rivers' demarcation and shared basin's size and analyzed that size of shared basin is source of water scarcity and conflicts rather than demarcation (Gleditsch & Nordas, 2006). A sketch of above-mentioned School of Thoughts of water conflict is given in below table.

Table:(2) Major School of Thoughts of Water Securitization

School	Metrics	Scale of conflict	Def of security	Findings
Gleik	1) Ratio of water demand to supply; 2) Water availability per person; 3) Fraction of water supply originating outside of a nation's borders; and 4) Dependence on hydroelectricity as a fraction of total electrical supply	Local, regional, interstate	Environment and natural resources included in so far as they may cause conflict	Scarcity can drive conflict. Particularly when caused by the combination of a misdistribution of water and high levels of population/ development.
Homer-Dixon	Two countries share a river; Downstream state is highly dependant on the water flowing from the upstream state; When the downstream state is more powerful that the upstream state; Upstream state has history of using the water as a coercive mechanism; Downstream state prone to the use of military power	Civil strife and insurgency; Interstate conflict	Environmental security	Environmental scarcity will in the future cause conflict.
Wolf	Conditions potential leading to negative interactions: 1) Uncoordinated development of a major project that affects flow (such as a dam) in the absence of a treaty or commission; 2) "Internationalized basins" such as in post-Soviet Central Asia; and 3) General animosity among parties	Relations, positive and negative, between states.	Environmental security	Potential for conflict/cooperation is a function of resource scarcity defined as stress on physical system and institutional capacity. ie – rate of change versus institutional capacity.
Gleditch	Shared rivers; Shared basins; Basin size; Border demarkating rivers; Scarcity	Militarized conflict between states	State security	All things being equal, countries that share rivers, basins and are dry, are more likely to go to war than simply contiguous countries.

Source: Burgess, Owen & Sinha (2016). "Human Securitization of Water? A Case study of the Indus Waters Basin".

Nonetheless, all these approaches elaborate the correlation of water and water-born conflicts among the co-basin countries. Water being geopolitical mean, deeply associated with humans, thus the shortage of water adversely affects the people and states' relations, ultimately encourage water securitization, national and human security discourses.

Theoretical Framework

Securitization Theory (ST)

In South-Asia, the water sharing of transboundary rivers of Indus Basin between Indo-Pak confronted many peaks and troughs. Hydro-politicization is heading towards water securitization, human, food and energy security, also associated with national security paradigms. The three key factors for water shortage in Pakistan are: Indian hydro-hegemony, climate change, maladministration and mismanagement of water reserves. The water securitization is resulting security interdependence rather than economic interdependence and mounting higher state-to-state securitization strains. The evolving nexus of environmental security emerged in the mutual relations of states and could even provoke armed conflicts among them.

In order to elaborate the conflicts pertinent to water sharing and resources management, the research is intending for Securitization Theory (ST), aimed at the notions of Buzan Barry, Ole Waever and Jaap de Wilde, having their roots from Copenhagen School of Thoughts, with the expansion and deepening of national security discourses. The theory comprehends the prophesy of tagging an issue as "existential threat (s) by means of some "securitizing actor (s)" to "referent object (susceptible element(s), known as Securitization (Buzan, Waever & Wilde, 1998). Thus, the declaration of something as threat to referent object's sovereignty and survival by securitizing actor, transfers it from ordinary to emergency domains, dealt subjectively, so requires superfluous and swift responses beyond ordinary and political spheres. It is a socially constructed speech act, rapidly moves an issue from optimal politicized to securitizes paradigms, who success is overwhelmingly dependent on the acceptance of audience and viability of internal and external state of affairs. The rationale of national security can be widened via several sectors who details and their specific interaction are given in the table below (Buzan, et. al, 1998).

Table: (3) Sectors of Securitization and their Mutual Relations

Sector	Military	Political	Economic	Societal	Environmental
Relationship	Forceful coercion through military means	Authority, status of governance and legitimate recognition	Trade, production and finance - development and stability	Collective/individual identity	Relationship between humanity and planet
Common threat	Other states' military capabilities	State/nation, ideology	National/individual economy	Norms, culture, 'way of life'	Environment

Source: Petersen (2015). "Instrumental Securitization: An Investigation of Contemporary Indo-Pakistani Hydro-Political Dynamics".

Water War Rationality

Though being renewable resource, water and its distribution schemes are now placed in the paradigms of conflict studies due to unceasing scarceness and practice as a weapon of war that can even instigate the security matters for state, but it is still not the sole cause of conflict among rival states. Peter Gleick (2004) stated, "water [is] a subject of military action, an instrument of war, and a salient element of interests in politics". Similarly, water inadequacy enthused Homer-Dixon to intended for notion of 'Water War' which attracted many others (Ullman, 1995). Thus, water dearth, pollution, ecological anomalies, control, divergence competitiveness and overuse of water resources together with the emerging political influences in hydrological issue may trigger controversies, armed conflict and rationalize the water war discourses.

Contrary to this, some analysts criticize the rationality of water war and believe on conception that water can be cause of cooperation rather than conflict. Alam (2002) manifested the legitimacy of this discourse by employing the scenario of Indo-Pak hydrological crisis, where despite all motives of a full-fledge war, both states came across negotiation and coordinate by signing IWT in 1960 for ultimate benefits, thus labelled them as, "Water Rational Actors". Likewise, the treaties between Israel and Palestine, Egypt and Sudan, Nepal and India, Bangladesh and India, etc. seconds the cooperative discourses. Nevertheless, co-basin states habitually harmonize to accomplish the shrewdness of water for long-term access of resources and securitizing actors or management can't alone frame an issue as existential threat. Hence, whatever the approach is accepted, it illustrates the rationality of water and claim for the de-securitization, conflict management, compromise and cooperation by concerning states to confront hydrological issues.

Indian Hydro-hegemony and Hydrological Security Complex (HSC)

Sub-Continent is experiencing water conflicts since from British regime in the region. The unfair and hurried partition made Pakistan down streamer on Indus

Rivers System. Kashmir issue has direct connection with water-born conflicts. As, an ex-President of Pakistan Pervez Musharraf once stated, "If one is resolved, the other would not exist" (Gilani, 2009). The bitterness of states' relations grew worse due to strategic control and construction of numerous dams and hydro-power projects by India on Western Rivers, generating extreme water security and depletion concerns for Pakistan (Ali, 2008). Hence, it's not the solitary cause of enduring rivalry with zero-sum relations but the amalgamation of religious, territorial, economic, ethnic and socio-political issues, thus hydrological relations are being exceedingly politicize, securitized and co-related with national security. Subsequently, these circumstances caused diverse security dilemmas by mutual securitization and Hydrological Security Complexes[5] (HSC) for lower riparian Pakistan by its upper riparian India. Pakistan is undergoing both qualitative and quantitative vulnerability of its ground and fresh water resources. The fiasco of hydrological anxieties is intricated in both states by ruling groups (securitizing actors), accusing adversaries to hide their administrative failure, avert public attention from native discrepancies via serving some special groups to get hidden political and strategical interests (Sinha, 2014). The extreme politicization of water issue spilled it into human insecurity, inter-state animosities, national and water securitization paradigms. Mutual Distrust is mother of all issues in Indo-Pak relations. The hydro-hegemonic intensions and verbal strain of India is causing a permanent "sufferer anxiety syndrome"[6] for Pakistan (Burgess, Owen & Sinha, 2016). Moreover, both the states tackle water issue on political, ideological and sentimental grounds rather than the social and environmental bases like rest of the world.

The rapid waning in Indus Waters' is the prime point of contention between Indo-Pak water sharing of Indus Rivers System, while eternally swelling gap in natural renewal and removal of water resources may cause 'basin closer'[7], making both states highly vulnerable to global peace (Turton, 2008: 8). Furthermore, water securitization could not detach from political, economic and social aspects, as Indians has religious and cultural affiliations with water bodies, mounting as an 'endless source' rather than 'resource' (Burgess, Owen & Sinha, 2016). Thus, the socially constructed water scarcity may cause either violent or non-violent conflicts

[5]Hydrological Security Complexes (HSC) comprises the increased securitization and vulnerabilities of water resources for lower riparian state through the hydro-hegemonic intensions, construction of dams and energy power projects by the upper riparian of co-basin states which results in zero-sum perceptions, mounting water as a national security concern moderately to deter the consideration from domestic problems.

[6] Sufferer Anxiety Syndrome is the combination of numerous anxieties like strength of upper riparian state, political and diplomatic pressures, hegemonic intensions, diversion and blocking of rivers' flow, etc. suffered by the effected lower riparian state and a trajectory to bilateral and regional conflicts between co-basin countries.

[7] Basin Closure is hydrological term related to the distribution of available water resources for production, generating water depletion and leaving no more water for allocation.

and the coercive Indian strategies can result in permanent water scarceness for Pakistan. Following table particularizes the traditional Securitization Theory into analytical context between Indo-Pak.

Table:(4) Traditional Securitization Analysis in Context of Indo-Pak

		India	Pakistan
Traditional Securitization Analysis	Existential Threat	Climate change, water-scarcity	India (dams), water-scarcity
	Referent Object	Nation, environment, economy, development	Nation, public, environment, economy, development
	Actor(s)	Elites (policy makers, 'experts')	Elites (policy makers, military, 'experts'
	Audience	Policy makers, public	Policy makers, public, international community
Context and Practice Analysis	Context	Hydro-hegemon: seeks legitimation through hydraulic mission, securitization being instrumental in maintaining animosity while diverting attention from domestic (mis)management	Lower-riparian: influenced by an 'anxiety complex', consolidates power through scapegoating, securitization being instrumental in maintaining animosity while diverting attention from domestic (mis)management
	Practice	Hydrological power-project construction justified by a developmental discourse, practicing secrecy, pursuing bi-lateral negotiations, attempting 'imposed 'political' solutions	Obstructs Indian attempts at constructing dams justified through a legal, treaty-based discourse, links domestic water-scarcity to Indian hydro-projects

Source: Petersen (2015). "Instrumental Securitization: An Investigation of Contemporary Indo-Pakistani Hydro-Political Dynamics".

Nevertheless, along with the Indian dominating ambitions and climate change, the hydro-politics at provincial and domestic level and mismanagement of available water reserves is also the core cause of qualitative and quantitative water strains in Pakistan. As, before IWT, Pakistan was getting 170 MAF of from Indus Rivers System but after treaty it was allocated 140 MAF of water, from which a large volume 35 MAF worth about $21 billion of water is annually dumped into the Arabian Sea unused from over three decades. Hence, 30 MAF of water can easily be store by dams' construction and storage barriers, but this aspect is harshly neglected by governments (Hussain, 2017). At the same time, China has 87,000 dams and water reservoirs, India has 3200 by 2012 and aiming at 2500 more by 2050, Afghanistan having 62 with 104 projects in pipeline while Pakistan has just 150 dams and water reservoirs. Consequently, the water storage capacity of India is 120-220 days while of Pakistan is merely 30 days (min. should be 120 days) which is quite alarming (Naqvi, 2013).

The evolution of chronic water scarcity with domination of hydrological issues over politico-strategic matters might result in the use of water as 'A tool of bargain' in Indo-Pak relations due to extreme jeopardy of water reservoirs, as enduring rivals are more prone to war than any other ordinary rival states (IDSA, 2010). The negligence of Pakistani governments and administration, laziness and ineffectiveness in water projects, hydro-politics at national level and unusual delay in the several hydro-projects is swiftly taking it at the edge of extreme water scarcity and securitization, which could bring unforgiving devastation for its agricultural

sector, economy, population and even perilous for state's security and survival. Additionally, the nuclear power acquisition of both states further deteriorates the prevailing water resentments. This awful situation demands immediate and sensible consideration by all the stakeholders of water towards the water management and utilization of modern technologies like drip irrigation and rubber dams for conservation of water resources before that it's too late.

Conclusions

Pakistan, being an agricultural, single basin and lower riparian state of Indus Rivers System, is at the edge of extreme water stress on its surface and ground water resources, which is instigating water security, human security, food security, health security and nations security discourses for the country. Water is becoming the biggest security challenge for Pakistan and in South Asia as a whole. Together with the tradition security threats from India, the non-traditional threats of insecurities due to climate change, Indian hydro-hegemony and mismanagement of available water reserves are precariously and rapidly exacerbating the water depletion. As, the nature doesn't respect the political boundaries, so the unpredictable and surprise stresses of climate change like swift ice melting, droughts, floods, increased precipitation and heat waves are additional insecurities of ecological variations, making the life of people more insecure and miserable, thus this not pretty scenario intensifying the human insecurities paradigms. Water shortage is an existential crisis for Pakistan, particularly due to its hostile neighborhood, posing domestic hydrological quantitative and qualitative threats, which can trigger violence and potential challenges to national security dimensions.

Thus, water is extremely flammable national security issue. Hence, no serious considerations are being paid towards dams' construction and conservation of water reservoirs, also the recycling, implementation of modern technologies and measurements to avoid the water wastage are highly neglected by administration. Nevertheless, as Indian hydro-hegemony intensions and climatic variations are overwhelming devastating, thus the present circumstances demand to stop blaming India, politicization and securitization of issue rather initiate working on practical grounds for the development, conservation and management projects of water reserves. Thus, in order to evade from suffering terrible water crisis in coming future, needs immediate decisions to build small and huge water storage dams for the survival of people and state, as there is no more time to waste and if still not done so, it means we have decided to embrace a collective suicide or disaster to come. This sensitivity and alarming situation of water issue could even lead to the water war between the nuclear states of Indo-Pak and ultimately distress the regional peace, security and stability.

Recommendations

Some recommendations to deal with the water issue are stated below:

- Need to develop coordination policies and Mutual Trust Building between Pakistan and India on water conflicts.
- Revise IWT, as it should be Benefit-Sharing Treaty rather than Water-Sharing or there should be some supplementary agreements based on maximum benefits of people.

- Involvement of some third party or international diplomacy can be helpful to resolve transboundary water issues.
- Utilization of Hydro-diplomacy with the focus on both table issues and future scenarios, people-to-people contact and to overcome the trade policy issues.
- Require the change of mind-sets in both states, evolve SOPs, tilt from voicing and securitization of water issue towards the development of new, sensible and most acceptable water policies for all the water stakeholders.
- Timely completion of Indus Basin projects, availability of financial resources, firm obligation of leaders to resolve the hydrological crisis.
- Implementation of Integrated Management of water resources, Knowledge-based Approaches, knowledge regarding data, hydrology and engineering and also install Telemetry System.
- Shift from Zero-sum to Positive-sum Approach in IWT, deal issues at embryonic stage, climate change matters and the issues forbidden by IWT.

References

[1] Alam, U. Z. (1998, September). Water Rationality: Mediating the Indus Waters (Doctoral Dissertation). Retrieved from http://etheses.dur.ac.uk/1053/

[2] Alam, U. Z. (2002). Questioning the Water War Rationale: Case Study of The Indus Waters Treaty. *The Geographical Journal*, *168*(4), 341-353.

[3] Ali, S. H. (2008). Water Politics in South Asia: Technocratic Cooperation and Lasting Security in The Indus Basin and Beyond. *Journal of International Affairs*, *61*(2), 170.

[4] Bhantnagar, M. (2009, Summer). Reconsidering the Indus Water Treaty. *Tulane Environmental Law Journal*, *22*(2), 295.

[5] Burgess, J. P., Owen, T., & Sinha, U. K. (2016). Human Securitization of Water? A Case study of the Indus Waters Basin. *Cambridge Review of International Affairs*, *29*(2), 382-407. http://dx.doi.org/10.1080/09557571.2013.799739

[6] Buzan, B., Waever, O., & Wilde, Jaap de (1998). *Security: A New Framework for Analysis*. Boulder, CO: Lynne Rienner Publishers.

[7] Byrnes, K. J. (1992, December). *Water User Associations in World Bank-Assisted Irrigation Projects in Pakistan.* World Bank Technical Paper, (chapter.1, 173). Retrieved from documents.worldbank.org/curated/en/651751468775762675/pdf/multi-page.pdf

[8] Cheema, P. I. (2000, September). The Politics of Punjab Boundary Award. *Working Papers*. Retrieved from http://www.asi.uni.heidelberge.de/SAPOL/HPSACP.html

[9] Cheema, P. I. (2006, February 26). Pak-India water Disputes. *THE POST*.

[10] Climate Change (2007). *Working Group II: Impacts, Adaptation and Vulnerability* (chapter 10.6.2, 493).

[11] Deen, T. (2008, March 19). Climate Change Deepening World Water Crisis. Retrieved from www.global policy.org/socecon/environment/climate/2008/03/19deepwater.html

[12] Fairley, J. (1975). *The Lion River: The Indus.* London; Penguin Books.

[13] Gareth, P. (2014). *Attitudes to Water in South Asia*. Vinset Advertising: New Delhi, India. Chatham House Report, The Royal Institute of International Affairs, UK (114).

[14] Gilamrtin, D. (1994). Scientific Empire and Imperial Science: Colonialism and Irrigation in Indus Basin. *The British Journal of Asian Studies*, *53*(4),1127-1149.

[15] Gilani, Iftikhar (2009, January 15). Pakistan on Brink of Water Disaster. *Daily Times.* Retrieved from http://www.dailytimes.com.pk

[16] Gleditsch, N. P. (2005). Resources, Conflict and Human Security. In R. A. Matthew, M. Brklacich, & D. Giannikopoulos (Eds.), *Global Environmental Change and Human Security*. Cambridge, MA: MIT Press.

[17] Gleditsch, N. P., & Nordas, R. (2006). Climate Change and Conflict. *Political Geography*, *26*(6), 627-638.

[18] Gleick, P. H. (1993). Water and Conflict: Fresh Water Resources and International Security. *International Security*, *18*, 79-112.

[19] Gleick, P. H. (2004, December). Water Conflict Chronology. *Pacific Institute*. Retrieved from http://www.worldwater.org/chronology.html

[20] Graves Jr., H. (1973). The Bank as International Mediator: In Three Episodes. In E.S. Mason, & R. E. Asher (Eds.), *The World Bank Since Bretton Woods.* Washington DC: The Brookings Institution Press.

[21] Haines, D. (2011). Concrete 'progress': Irrigation, Development and Modernity in mid-Twentieth Century Sind. *Modern Asian Studies*, *45*(1),179-200.

[22] Haines, D. (2017). *Indus Divided: India, Pakistan and the River Basin Dispute.* Haryana: Penguin Randon House.

[23] Homer-Dixon, T. (1999). *Environment, Scarcity, and Violence*. Princeton, NJ: Princeton University Press.

[24] Homer-Dixon, T. (2001). *Environment, Scarcity and Violence*. Princeton: NJ, USA. Princeton University Press.

[25] Hussain, I. (2017). *Political and Legal Dimensions: Indus Waters Treaty*. Karachi, Pakistan: Oxford University Press.

[26] IDSA (2010). *Water Security for India: The External Dynamics*. New Delhi: IDSA Task Force Report, Institute for Defence Studies and Analysis.

[27] Immerzeel, Dr. (2013, August 5). Scientists Predict Warmer and Wetter Himalayas. Retrieved from http://www.icimod.org/pq=11326

[28] Indus Treaty: Blood and water cannot flow together, says PM Modi after Meeting. (2016, September 26). *India Today*. Retrieved from https://www.indiatoday.in/india/story/indus-waters-treaty-meeting-narendra modipakistan-343297-2016-09-26

[29] IPCC Synthesis Report (2007). *Summary for Policy Makers*, (30). Retrieved from http://www.ch/pdf/assesment-report/ar4/syr/ar4_syr.pdf

[30] Iyer, R. (2005, July 16). Indus Treaty: A Different View. *Economics and Political Weekly*, *40*(29), 3140-3144. Retrieved from https://www.epw.in/journal/2005/29/commentary/indus-treaty-different-view.html

[31] Khalid, I., Mukhtar, A., & Ahmed, Z. (2014). Water Scarcity in South Asia: A Potential Conflict of Future Decades. *Journal of Political Studies*, *21*(1).

[32] Khan, F. (2009, September). Water, Governance, and Corruption in Pakistan. In M. Kugelman & R. Hathaway (Eds.), *Running on Empty: Pakistan's Water Crisis*. Woodrow Wilson Center Press. Retrieved from http://www.wilsoncenter.org/topics/pubs/ASIA_090422_Running%20on%20Empty_web.pdf

[33] Khan, F. H. (2012). *Eating Grass: The Making of Pakistani Bomb*. Stanford, California: Stanford University Press.

[34] Khan, M. R. (2013, January-June). Crucial Water Issues between Pakistan and India, CBMs and the role of Media. *A Research Journal of South-Asian Studies*, *28*(1), 213-221.

[35] Kux, D. (2006). *India-Pakistan Negotiations: Is Past Still Prologue*. Washington: US Institute of Peace Press.

[36] Malik, B. A. (2005). *Indus Waters Treaty in Retrospect*. Lahore: Brite Books.

[37] Mehmood, A. (2018). *Hydro-Diplomacy: Preventing Water War Between Nuclear-Armed Pakistan and India*. Islamabad, Pakistan: IPS Press.

[38] Mehta, J. S. (1988). The Indus Waters Treaty: A Case Study in the Resolution of An International River Basin Conflict. *Natural Resources Forum*, *12*(1), 69-77. https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1477-8947.1988.tb00803.x

[39] Michel, A. A. (1967). *The Indus River: A Study of the Effects of Partition.* New Haven and London: Yale University Press.

[40] Morton, K. (2011). Climate Change and Security at the Third Pole. *Survival*, *53*(1), 121-132.

[41] Naqvi, S. A. (2013). *Indus Waters and Social Change: The Evolution and Transition of Agrarian Society in Pakistan*. Karachi, Pakistan: Oxford University Press.

[42] Otis, G. (27 August, 2002). A World Without Water. Retrieved from https://www.globalpolicy.org/component/content/article/174/30630.html

[43] PILDAT (2011). *Inter Provincial water Issues in Pakistan*. Background Paper PILDAT.

[44] Pitman, G. T. K. (1998). The Role of the World Bank in Enhancing Cooperation and Resolving Conflict on International Watercourses: The case of The Indus Basin. In M. A. Salman & Laurence Boisson de Chazournes (Eds.), *International Watercourses: Enhancing Cooperation and Managing Conflict* (pp. 155). Washington DC: Work Bank.

[45] Prins, G. (2002). *The Heart of War: On Power Conflict and Obligation in the Twenty First Century*. London & New York: Routledge.

[46] Population Seven Billion: UN Sets Out Challenges. (2011, October 26). *BBC.* Retrieved from https://www.bbc.com/news/world-15459643

[47] Saleem, H. A. (2008). Water politics in South Asia: Technocratic Cooperation and Lasting Security in the Indus Basin and beyond. *Journal of International Affairs*, *61*(2), 170.

[48] Salman, M. A., & Uprety, K. (2002). *Conflict and Cooperation on South Asia's International Rivers: A Legal Perspective*. Washington DC: World Bank.

[49] Siddique, I. H. (2010). *Hydro-Politics and Water Wars in South-Asia.* Lahore, Pakistan: Banquet Printing Press.

[50] Sinha, U. K. (2005). Water Security: A Discursive Analysis. *Strategic Analysis, 29*(2), 317-331.

[51] Sinha, U. K. (2010, December 14). Water and energy: A flashpoint in Pakistan-India Relations. Retrieved from http://www.ensec.org/index.php?option=com

[52] Sinha, U. K. (2010). Water as a Pre-Eminent Political Issue between India and Pakistan. *Strategic Analysis*, *34*(4), 482-485.

[53] Sinha, U. K. (2014). The Strategic Politics of Water in South Asia. In J. Miklian & A. Kolas (Eds.), *India's Human Security: Lost Debates, Forgotten People, Intractable Challenges* (pp. 58-71). Abingdon, Oxon: Routledge.

[54] Thapliyal, S. (2011). Water Security or Security of Water: A Conceptual Analysis. *India Quarterly: A Journal of International Affairs*, *67*(1), 1-21.

[55] Turton, A. (2003, May 31). The Political Aspects of Institutional Developments in the Water Sector: South Africa and its International River

Basins (Doctoral Dissertation). Retrieved from http://www.transboundarywaters.orst.edu/publications/related_research/Turton/Turton-FrontMatter.pdf.

[56] Ullman, R. (1995). Redefining Security. In Sean M. Lynn-Jones & Steve E. Miller (Eds.), *Global Dangers: Changing Dimensions of International Security* (pp. 15-39). Cambridge, MA: The MIT Press.

[57] United Nations Development Program (UNDP) (2016). *Water Security in Pakistan: Issues and Challenges*. Development Advocate of Pakistan, *3*(4).

[58] United Nations Development Program (UNDP) (2017). *Water Security in Pakistan: Issues and Challenges*. Development Advocate of Pakistan.

[59] USAID (20 November, 2010). *Changing Glaciers and Hydrology in Asia: Addressing Vulnerabilities to Glacier Melt Impacts* (21). USAID Publication.

[60] Vajpeyi, D. K. (2014). *Water Resource Conflicts and International Security: A Global Perspective*. UK: Lexington Books.

[61] Verghese, B. G. (2002, April 29). Talk of Abrogating Indus Waters Treaty. *The Tribune*. Retrieved from https://www.tribuneindia.com/2002/20020429/edit.htm#3

[62] Verghese, B. G. (2005, March 24-25). Political fuss over the Indus. *The Tribune*. Retrieved from http://www.bgverghese.com/Indus.htm

[63] Verghese, B. G. (2005, May 26). It's Time for Indus-II: A New Treaty Will Help the Peace Process too. *The Tribune*. Retrieved from https://www.tribuneindia.com/2005/20050526/edit.htm#4

[64] Walker, C. (2007, May 28). Water, Water, Everywhere, nor any Drop to Drink. Retrieved from https://www.bolshevik.info/water-crisis280507.htm

[65] Wolf, A. T., Stahl, K., & Macomber, M. F. (2003). Conflict and Cooperation within International River Basins: The Importance of Institutional Capacity. *Water Resources Update, 125*, 31-40.

[66] Wolf, A. T., Carius, A., & Dabelko, G. D. (2004). *Water Conflict and Cooperation* (10). ECSP Report.