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Contemporary water security issues in Asia

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Abstract

The increasing water stress in Asia has direct consequences for economic and human development as well as environmental protection in this era of globalization. Furthermore, access to the waters of international river basins throughout the third world has generated intense competition among riparian states. Three regions in Asia are having water related conflicts and they may escalate in the future. These regions include South Asia, Central Asia and South East Asia. While all these challenges and conflicts are daunting, there are ways to overcome them and develop solutions, most importantly hydro diplomacy.

Keywords: Asia; Water Security; Water Conflicts; Hydro Diplomacy; Globalization

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1. Introduction

Water security is an important phenomenon in international and water and development community but it would require great effort to achieve. The recent definition of water security is focused on "the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies" (Lautze and Manthrithilake, 2012). In the contemporary era water security has become a major concern not only for Asia but also for the entire world. There is a significant threat to the water security at regional and global level most particularly in Asia as it is hosting approximately 60% of world population (World Population).

Asia is facing number of problems which includes immensely growing population, environmental issues, shortage of energy and poverty and all these factors are resulting into the scarcity of the water in the region. This is a key challenge to water security and many organizations have presented many evidences regarding the water security. The 2030 Water Resource Group articulated that with the total annual sustainable freshwater supply remaining static at 4,200 billion cubic meters (m3), the annual shortfall for 2030 is forecasted to be 2,765 billion (Middleton et al., 2015). These facts are very allowing and if proper measurements are not taken, international trade and environment would suffer as in this era of inter connectivity, everything is linked. Water routes; especially have great importance with respect to trade.

Asia and Pacific region is considered as global hot spot for water insecurity. In the past 20 years Asia is facing high risks from water related disasters, which includes floods, droughts storms and earthquakes. These disasters have cost about $53billion annually. International Institute for Applied Systems Analysis has prepared the Asian Water Futures and Solutions 2050 report which provides essential estimates that up to 3.4 billion people could be living in water-stressed areas of Asia by 2050. Furthermore, Afghanistan, the PRC, India, Singapore and Pakistan will have the lowest per capita water availability (Asian Development Bank, 2016).

Asian countries are not homogeneous in their social and economic development. So, it is very difficult to draw the generalized picture of water trends in Asia that will be equally applicable to all over the region. The issues are becoming more complex with increasing trend of globalization, liberty of trade, due to which insecurities related to food and environment are getting more serious. All these things are affecting the quality and quantity of available water in one way or other.

1.1. Objective

- To analyze the water conflicts in Asia
- To analyze water security
- Policy solution in shape of hydro diplomacy

2. Water related conflicts in Asia

Previously, conflicts among nations were over land but now the dynamics of conflicts have changed and countries are fighting to get more energy resources and power. The future depicts that the conflicts these will

be about water. The 20th century naval flag officer, strategist and historian, Alfred Thayer Mahan had predicted that the future of the 21st century would be determined on the waters of the Indian Ocean in these words, "Whoever controls the Indian Ocean dominates Asia. This ocean is the key to the seven seas in the 21st century, the destiny of the world will be decided in these waters"(Khan, 2011). Three regions in Asia are having high risks of water related conflicts in future. These regions include South Asia, Central Asia and South East Asia.

In central Asia, the Caspian Sea is divided between the five littoral states of Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan. The dispute is a very old one, over the Syr Darya and Amu Darya between the upstream states Kyrgyzstan and Tajikistan and downstream states Kazakhstan, Turkmenistan and Uzbekistan (Bajpaee, 2006).

In South East Asia tensions related to water are growing among six states including major state of China. Other nations embroiled in this conflict are Cambodia, Laos, Myanmar, Thailand, and Vietnam. The main point of concern is to construct a Dam over the Mekong River. This river stretches from Tibetan Plateau and flows through the Yunnan province and passes from the Cambodia, Laos, Myanmar, Thailand, and Vietnam up to the South China Sea (Yeophantong, 2014). Being an upper stream state China attempted to develop a dame over Mekong River.

An atmosphere of distrust was spread along the lower stream countries, when there was temporary rise of water level during the December. It resulted in massive flooding in some parts of Northern Thailand and Laos. The flood also led to an onslaught of the so-called 'Mekong River tsunami'; families living along the banks of the Mekong in the Thai districts of Chiang Saen, Chiang Khan and Khong Chiem have faced the massive destruction and the muddy waters also destroy their crops and all other basic necessities within few hours (Yeophantong, 2014).

Four agrarian economies of South Asia are indulged in water related conflicts. These countries are India, Pakistan, Bangladesh and Nepal. On eastern boarder India is having water conflict with China, Nepal and Bangladesh. The Kosi agreement was signed between India and Nepal in 1954, in order to regulate flow of water, power generation and irrigation between two states,

China is also having plans to control the water of Brahmaputra Rivers, which is creating a tension in lower riparian states of India and Bangladesh. China's construction of dames and the proposed preoccupation of the Brahmaputra's waters will not only affect the flow of water, agriculture and ecosystem but it will also work as another bone of contention between Sino Indian relations (Ramachandran, 2015).

The tension between India and Pakistan over Kashmir is also greatly linked to issue of water control. Although it was believed that the dispute would be settled between India and Pakistan in 1960 with the signing of Indus water treaty. But with passage of time India has tried to violate the treaty a number of times. India tried to made dams stop flow of water from reaching Pakistan. The most recent example is in 2016 after the Uri attack which renewed tensions between India and Pakistan. India decided to review the treaty with Pakistan. Indian Prime Minister, Narendra Modi has also given an outrageous statement that "Water related to India cannot flow into Pakistan, in order to provide sufficient water to the farmers" (Geo News, 2016). This shows that any move from India related to water issues can create high levels of tension between

both states and this also gives us a glimpse of how water will be used as a weapon in future. Threat of the provocation of treaty by India is taken seriously in Pakistan and Mr Sartaj Aziz responded that "if India tries to interrupt water flow into Pakistan, it will not only violate the Indus Waters Treaty, but also set a regional state practice under which international law can serve as a precedent" (Dawn, 2016).

In order to avoid future disputes over water a framework should be adopted which can turn water from a source of conflict to source of cooperation. It should provide a mechanism to negotiate and resolve their disputes in a peaceful manner. Hence, it is a time the Asia to realise that instead of fighting they should focus on peaceful cooperation.

3. Linking water and security

'Water Security' is a reliable access to quality and quantity water for basic human needs, livelihood and ecosystem. There are two pillars that support the water security, i) Water resources and ii) water supply services. Asian water crisis is framed in variety of ways in various discourses of water security. Growing population, rapid urbanization and water usage in domestic and industrial sector have changed the demand pattern of water in Asia. Expanding water demands in these areas is also changing the landscape of water management in Asia.

Figure 1. Water Outlook of Asia (Source: http://www.worldatlas.com/webimage/countrys/as.htm)

New emerging trends including globalization, free trade and technological developments are bringing new challenges for the water sector. Water consumption regionally and locally has increased the competition for

water. Therefore, today water resources are high priority concern in all the countries of the region. According to the Asian Development Bank Outlook (AWDO 2016) release in Stockholm, Asia is one of the world's vulnerable regions to water insecurity and is unable to sustain its current economic growth without resolving the issue (Asian Development Bank, 2016). Thus achieving water security for all is impossible without understanding the complex connection between water, food and energy security of the region.

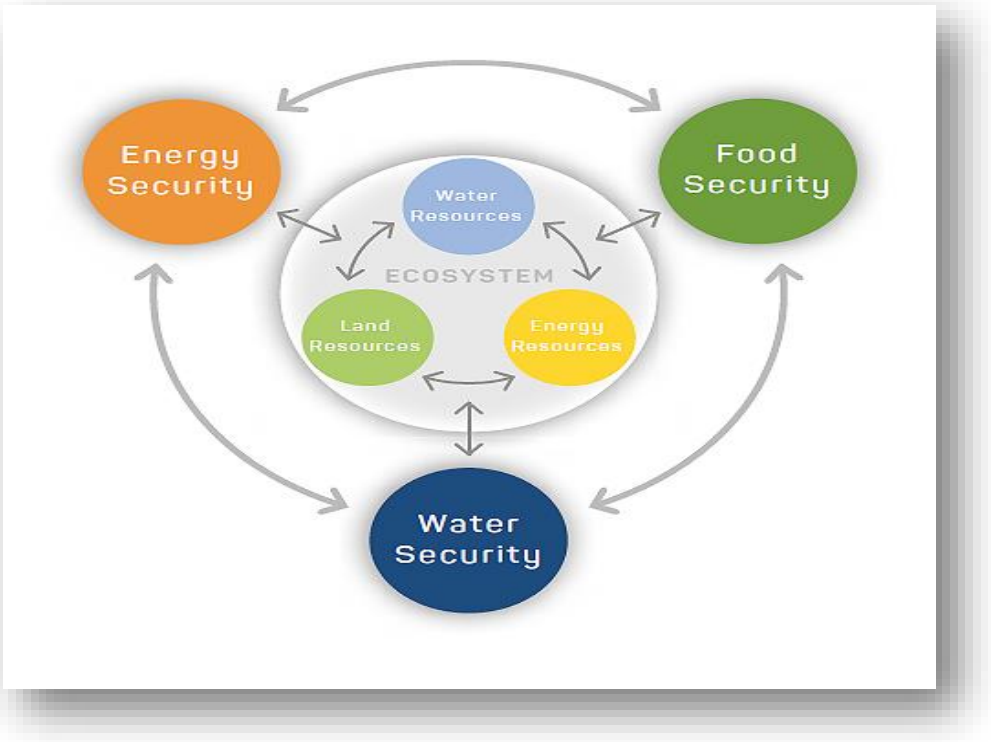

Figure 2. Water-Food-Energy Nexus (*Source*: www.water-energy-food.org/about/introduction/)

The above nexus highlights the interdependency between water, food and energy security and ecosystem services for human well-being. With growing water stress (See Figure 3) Asia faces the challenges of providing enough water to food and energy production.

Furthermore, adequate availability of fresh water is also important feature in Asia. According to a study released by MIT researchers around 4.4 billion people in Asia could face fresh water shortages in future (Fant et al., 2016). Six trans-boundary rivers (as highlighted in Part I) of the region are under extensive use to develop the hydropower dams, irrigation expansions and power generation. Besides, these rivers are also water resource and livelihood for over billions of people. However, over the past few decades environmental changes and increasing water demands have resulted in depletion these water resources. The risks of conflicts could also occur due to dwindling accessibility to water resources in those countries of the region that share the water basins or trans-boundary Rivers.

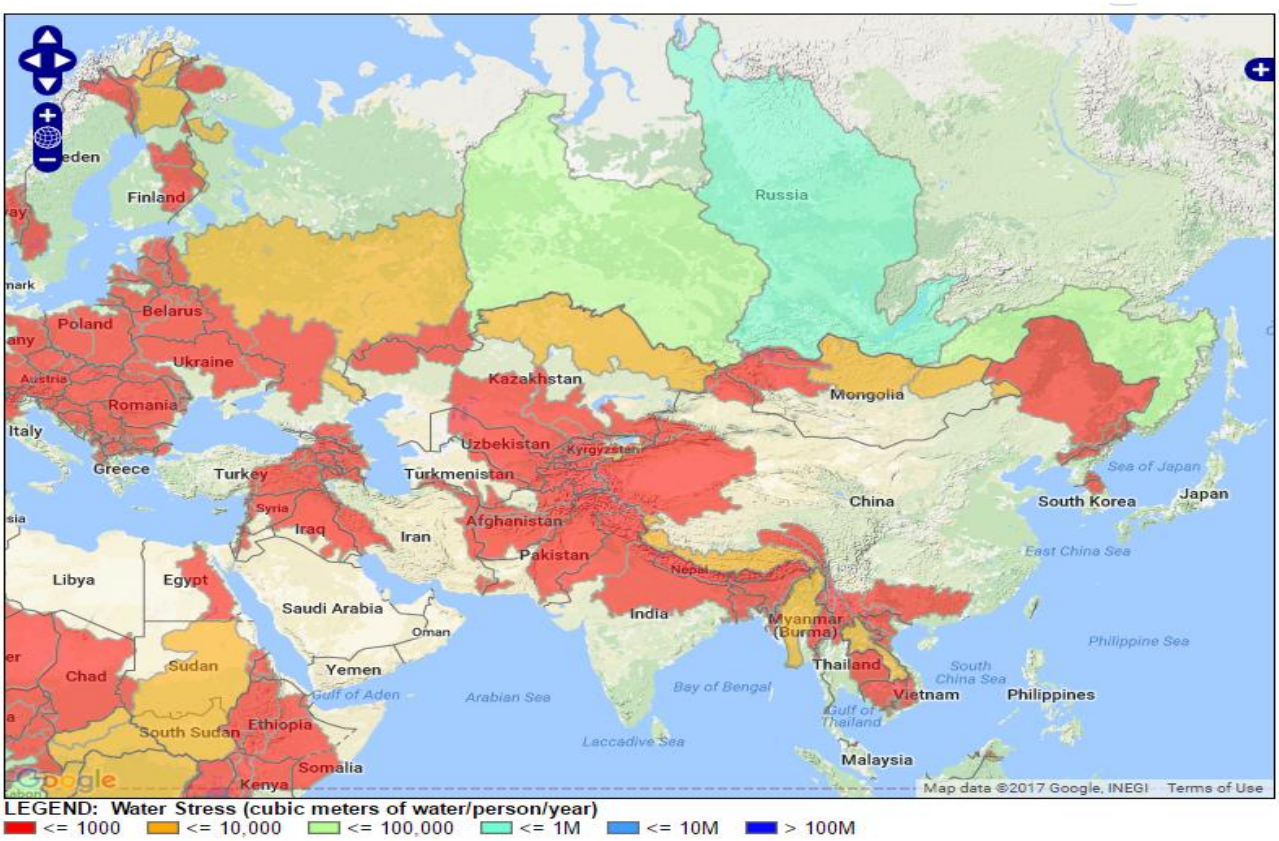

Figure 3. Trans-boundary Fresh Water Stress, February 9, 2017 (Source: http://gis.nacse.org/tfdd/index.php)

The above figure shows the per year water stress of a person in the region. Thus, majority areas of Asia are in enduring state of water stress. Consequently above mentioned nexus of Water-Food-Energy Security goes beyond its dimension to geopolitical conflicts (See Figure 4).

Furthermore, another matter of concern in Asia is the competition over the shared water resources. Countries which depend on the water flow from other countries are at higher risks. For instance, Singapore highly depends on Malaysia for water supplies (Tortajada and Pobre, 2011). Also there are countries in the region (such as India and in Mekong Delta region) that are planning to divert the water from the trans-boundary Rivers and setting up the infrastructure development across these boundaries which could result in trans-boundary conflicts.

Consequently water becomes a security issue when linked with human security that encompasses a number of issues which impacts the health to well-being of a person. Thus water security issues spawned by globalization, economic development poses a serious threat to the regional stability.

Central Asia is home to several water disputes along the Syr Darya and Amu Darya- mostly fed by snow- and glacier melt. Increasing demand for agricultural purposes in the upper stream countries has reduced the availability of water resources in lower stream countries. Kazakhstan and Uzbekistan are main water consumers of the region. Kyrgyzstan and Tajikistan dominate the water resources required by other states

(Zeitoun and Warner, 2006). Tension also fanned due to emergence of Central Asia region as global energy flashpoint (Berthier, 2007).

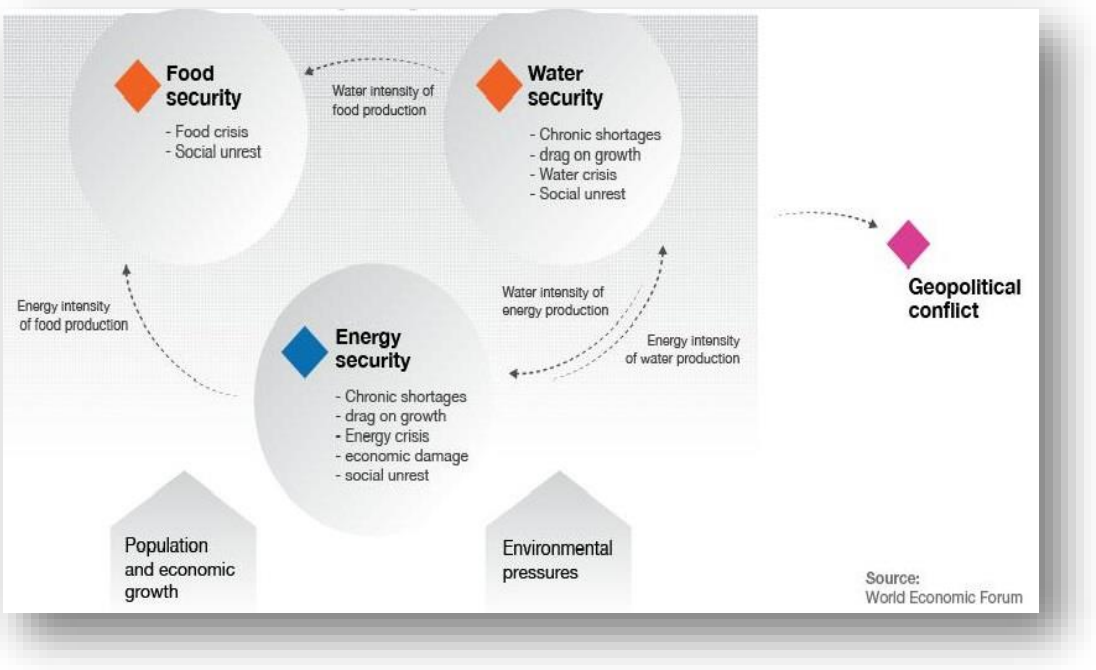

Figure 4. Risks Associated with Water-Food-Energy Nexus (Source: World Economic Forum)

Over exploitation of ground water resources in Bangladesh has also resulted in the reduced water supplies. Consequently, during the dry season ground water level falls below the critical threshold. Also, construction of Farraka Barrage by India on the Ganges River has limited the water flow in Bangladesh. The barrage constructed five decades ago still impacts the livelihood of the people of Bangladesh. Ground water is depleting, people are forced to migrate during the dry seasons (Lovelle, 2016). According to Bangladesh Rural Water Supply and Sanitation Project (BRWSSP) around 20 million people lack access to safe water in Bangladesh (World Bank, 2016). Also rising sea level forces around 18 million people to migrate. It is expected that mainstream environmental migrants will be coming from Bangladesh in future. Tran-boundary water management between India, Nepal and Bhutan also faces troubles. Due to failure of the treaties of Kosi and Gandak, India and Nepal have uneasy relationship. These unresolved treaties have heightened the relations between Nepal and India.

The Brahmaputra River is potential source of conflict between China and India over water. It is very significant for China due to its hydropower capability. China is planning to build four more dams over this river while it has one operational dam currently which is a major cause of concern for India. However India is also building two dams in the river basin. North-east region of India relies heavily on the water of this river. The upper stream area (Arunachal Pradesh) and downstream (Assam and Bangladesh) communities are concerned over the tremendous economic and social hazards they could face due to these projects.

Mekong River by providing fish and nutrients for agriculture, feeds millions of people in South East Asia. However, now the livelihood of these millions of people is under threat due to planned dams on lower Mekong River. Crossing between Tibet, Plateau, China, Myanmar, Laos, Thailand, Cambodia empties into South China Sea and enters Vietnam. Currently Lower Mekong (Laos, Thailand, Cambodia and Vietnam) has no dams, while upper Mekong (Lancang River China) already has seven dams.

In South Asia, Kashmir has been the major source of conflict between the two nuclear states India and Pakistan. All of Pakistan's major rivers flow from the Indian Occupied Kashmir (IOK) intensifies the tensions over water. The recent construction of Baghlihar and Kishanganga dam over rivers further heightened the tension. Indus River is another source of tension. Indus Water treaty signed between the two countries resolved the water issues between the states since 1960. However, Indian hawks now are demanding the abrogation of this treaty publically. Indian Prime Minister Narendra Modi also said recently regarding the Water agreements signed between India and Pakistan that "blood and water cannot flow simultaneously." (Indian Express, 2016) Around ninety percent of Pakistan's agriculture depends on the Indus water. Also India's plans to build 155 hydropower projects in IOK have increased the distress between the two countries (Hill, 2009). These unresolved issues in the Asia could not only heighten the tensions between the countries but would also raise the likelihood migration in the region. Thus tensions over water are rising in Asia not merely due to conflicting maritime claims but also unsettled territorial disputes. Also the competition over fresh water is threatening and Asia region is expected to suffer severe fresh water shortages which could also emerge as a serious risk to long term peace and stability of the region.

4. Policy design: Hydro diplomacy in Asia, from potential conflict to cooperation

Multilateral and bilateral donors have assisted and stimulated international treaties to facilitate cooperative behaviour among the states and contain the conflicts over the shared waters. World Bank has supported and facilitated Mekong River Commission and Indus Water treaty in Asia to promote the cooperation between the riparian states. Furthermore, Development agencies emphasize on management of the trans-boundary water institutions to prevent conflict and promote the regional cooperation. Furthermore, development agencies frequently substantiate these investments by stressing on the trans-boundary conflict prevention and management of the water issues by assisting deeper regional cooperation. Thus hydro-diplomacy and its prospective benefits are on rise. There is need for countries to strengthen their capabilities to involve and participate in the preventive diplomacy focusing on the water. Greater coordination among the relevant ministries is required in support of water conservation and management.

In Asia water is regarded as a strategic resource that is to be valued. Therefore, among the countries which share water resources, the potential of conflict is always present. Confidentiality of the water resources is another challenge to the water diplomacy. Transparency and sharing of data is quite essential in developing a trans-boundary water resource management and preventing the conflicts. However, this remains a challenge due to historical tensions and disputes in various part of Asia. Also in majority of the trans-boundary basins institutional arrangements for basin level cooperation is lacking. In many countries

such as Bangladesh, India and others water information is collected in a fragmented manner. Lack of data on water resources makes it difficult for the donors and facilitators to develop treaties on the use of the shared water resources which further increases the conflicts risks and forced migration.

But the fact that riparian countries in the region have been able to engage in institutional cooperation over water issues in the past means that they can still move towards closer collaboration and cooperation and developing a mechanism for managing shared waters between them in future. "The treaties over the Indus between India and Pakistan, over the Ganges between India and Bangladesh, and over Mahakali between India and Nepal, have stood the test of time despite fluctuating political relations between the countries.

A report on Water for Human Development: Human development in South Asia 2013 — launched by the Mahbub ul Haq, the Human Development Centre points out that South Asian countries could use their shared water resources for attacking poverty and achieving economic development by implementing a mechanism to monitor and assess shared water, and by collaborating closely with one another to resolve their water-sharing disputes (Jamal, 2013).

It is essential that the Asian countries should include water in the security policy planning to avoid conflict and address the trans-boundary water issues. In this way disaster warning systems could be strengthened. All the countries should encourage the collective investment in collaborative management technologies that would benefit all. This will help in improved methods to desalinate water etc. that could tolerate the low water levels. Furthermore, the states need to generate better policies through dialogue at every level. Policy makers, civil society and private enterprises must gather to sustain the water management practices.

The idea of link between water security and war over the past few decades have gone to a point where it becomes ideologically hegemonic. However this does not mean that the idea of water peace has doomed. Through effective hydro diplomacy water peace camps can be provided like previously done through joint Israel- Palestine call to protect their water supplies in 2001. What has not changed so far is that our problems are not new. Our water demands are rising, our ability to pollute is global, our societies are interlinked and many more.

Other Recommendations:

1- All the countries should use Intergovernmental Panel on Climate Change (IPCC) data on water availability to develop the early warning systems on the regional level.
2- Existing efforts to support water management such as Asia-Pacific Water Summit, should be implemented and supported.
3- In the rural and urban areas water financing partnership facility should be expanded to sustain this effort across the Asia.
4- Correspond to the water related Millennium Development Goals (MDGs) that can managed and implemented to meet the future targets in Asia.
5- There is dire need to improve the data quality to generate better water management policies. International Organizations such as United Nations must endow with a data- collection capacity to collect the relevant data

5. Conclusion

Climate change, population growth and urbanization have placed water resources in Asia under stress. Extreme weather events and rapid expansion are likely to create millions of migrants in future. Though there has been change in the level of relationship between Asia and other regions of the world. However, rapid development, increasing population and long-standing inter-state uncertainties in Central Asia, South Asia and South East Asia raises the likelihood of the water related conflicts in these regions and makes water related stresses wider regional and potentially significant globally. There are many successful multipart management frameworks stretching from Mekong river up to the Indus Water, however need is to support and respect such initiatives with focus on hydro-diplomacy. With better and effective planning and leadership this water crisis can be changed into a catalyst for enduring cooperation between the countries in Asia and make Asia even a bigger force to reckon with in global arena.

References

Asian Development Bank (2016), "Asia Pacific Shows Progress in Water Security, But Challenges Remain – ADB," World Bank, 30 August, available at: https://www.adb.org/news/asia-pacific-shows-progress-water-security-challenges-remain-adb

Asian Development Bank (2016), "ASIAN WATER DEVELOPMENT OUTLOOK 2016: STRENGTHENING WATER SECURITY IN ASIA AND THE PACIFIC," ADB: Philippines

Bajpaee, C. (2006), "Asia's coming water wars," *Asia-Pacific Journal*, vol. 4 No. 8.

Berthier, E., Arnaud, Y., Kumar, R., Ahmad, S., Wagnon, P. and Chevallier, P. (2007), "Remote Sens¬ing Estimates of Glacier Mass Balances in the Himachal Pradesh (Western Himalaya, India)", *Remote Sensing of the Environment*, Vol. 108, pp. 327–338.

Fant, C., Schlosser, A.C., Gao, X., Strzepek, K. and Reily J. (2016), "Projection of Water stress based on an Ensemble of socio economic growth and climate change scenarios: A case Study in Asia", *Journal Plos One*, available at: http://dx.doi.org/10.1371/journal.pone.0150633

Geo News (2016), "India steps up efforts to stop Pakistan's water," 22 December.

Geo News (2016), "Water belonging to India cannot go to Pakistan,' says Modi," 25 Nov 25.

Hill, D. (2009), "Boundaries, scale and power in South Asia", *Water, sovereignty and borders in Asia and Oceania*, pp. 87-103.

Indian Express (2016), "Blood and Water cannot flow together," 27 September, available at: http://indianexpress.com/article/india/india-news-india/indus-water-treaty-blood-and-water-cant-flow-together-pm-modi-pakistan-uri-attack/

Jamal, N. (2013), "Need for hydro diplomacy," The Nation, 16 September, available at: https://www.dawn.com/news/1043271/need-for-hydro-diplomacy

Khan. A.S. (2011), "Greater Indian Ocean: A Peaceful Geo-Political Pivot Or A Contentious Source Of Hedging", *Eurasia Review*, available at: http://www.eurasiareview.com/23062011-greater-indian-ocean-a-peaceful-geopolitical-pivot-or-a-contentious-source-of-hedging/

Lautze, J. and Manthrithilake, H. (2012), "Water security: old concepts, new package, what value?", *Natural Resources Forum*, Vol. 36 No. 2, pp. 76-87.

Lovelle, M. (2016), "India, Bangldesh and Farraka Barrage," Future Directions International, available at: http://www.futuredirections.org.au/publication/india-bangladesh-farakka-barrage/

Middleton, C., Allouche, J., Gyawali. D. and Allen, S. (2015), "The rise and implications of the water-energy-food nexus in Southeast Asia through an environmental justice lens", *Water Alternatives*, Vol. 8 No. 1, pp. 627-654.

Patrick, M. S. (2012), "The Coming Water Crisis," The Atlantic, available at: https://www.theatlantic.com/international/archive/2012/05/the-coming-global-water-crisis/256896/

Ramachandran, S. (2015), "Water Wars: China, India and the Great Dam Rush," The Diplomat, 03 April.

Tortajada, C. and Pobre, K. (2011), "Singapore-Malaysia Water Relationship: An Analysis of Media Persepctive", *Hydrological Sciences Journal*, Vol. 56 No. 4, pp. 597-614.

World Bank (2016), The World Bank Fact Sheet. Safe Water for Rural Populations of Bangladesh: Bangladesh Rural Water Supply and Sanitation Project (BRWSSP)," available at: http://www.worldbank.org/en/news/feature/2016/03/15/safe-water-for-rural-population-in-bangladesh-bangladesh-rural-water-supply-and-sanitation-project-brwssp-fact-sheet

Yeophantong, P. (2014), "china and the spectre of water wars in southeast Asia", *global economic governance programme*.

Zeitoun, M. and Warner, J. (2006), "Hydro-Hegemony", *water policy*, Vol. 8, pp. 454-455.