



CENTER FOR GLOBAL & STRATEGIC STUDIES, ISLAMABAD

WATER SECURITY: ISSUES/WAY FORWARD ON AGGRESSION AND CONSERVATION

Conference & Roundtable Session Report



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Printed in Pakistan

Published in November, 2018

ISBN 978 969 7733 23 1

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Conference Report
“Water Security: Issues/Way Forward on Aggression and Conservation”



Organized by
Center for Global & Strategic Studies, Islamabad
At Marriott Hotel, Islamabad
On 24th October, 2018

Participants

The Conference was attended by almost 300 participants including diplomats, former Ambassadors, government representatives, armed forces officers, water experts and individuals from public and private entities.

Chief Guest **Ms. Zartaj Gul – Federal Minister of State for Climate Change**

Guest Speakers **Mr. Shams ul Mulk, Former Chairman, Water and Power Development Authority (WAPDA)**

Advocate Ahmer Bilal Soofi – Former Federal Minister of Law, Justice and Parliamentary Affairs

Major General Hafiz Masroor Ahmed, (Retd) – Vice President, CGSS

Dr. Muhammad Ashraf, Director General, Pakistan Council of Research in Water Resources (PCRWR)

Mr. Ahmed Kamal, Chairman, Federal Flood Commission

Mr. Zakir Hussain Dahri, National Coordinator on Water Resources, Pakistan Agriculture Research Council (PARC)

Dr. Muhammad Munir Ahmad, Director, Climate Energy and Water Resources Institute, National Agricultural Research Center, (NARC)

Mr. Waseem Anwer Baig, Management Consultant / COO, Baigmann Water Company, Lahore

Ms. Agnes Pompos (Hungary) - International Water Expert On Peaceful Water Sharing

Introduction of the Speakers

Ms. Zartaj Gul – Federal Minister of State for Climate Change

Ms. Zartaj Gul Wazir is a well-known Political figure who is presently Federal Minister of State for Climate Change, in office since 5 October 2018. She has been a member of the National Assembly of Pakistan since August 2018. She obtained her early education in her native town Bannu and Miramshah before moving to Lahore with her family. She attended Queen Mary College for her undergraduate studies and completed her postgraduate from National College of Arts for her postgraduate studies. She did Textile Designing from National College of Arts.



Mr. Shams ul Mulk, Former Chairman, Water and Power Development Authority (WAPDA)

Mr. Shamsul Mulk, HI, is a Pakistani civil engineer by profession and one of the most regarded professional figure in the Energy Sector. He had been the former Chairman of Water and Power Development Authority (WAPDA) and also served as the Provincial Minister in the province of Khyber Pakhtunkhwa (KP). He also served his province, the KPK as the caretaker Chief Minister in year 2008.



Advocate Ahmer Bilal Soofi – Former Federal Minister of Law, Justice and Parliamentary Affairs



Mr. Soofi is an Advocate of the Supreme Court of Pakistan. He served as the Federal Minister for Law, Justice & Parliamentary Affairs and Human Rights. He is also the founding President of Research Society of International Law. He has also served as the Member Advisory Council of United Nations Human Rights Committee.

Major General Hafiz Masroor Ahmed, (Retd) – Vice President, CGSS

Major General Hafiz Masroor Ahmed, (Retd) has an experience of 34 years in Pakistan Army. General Masroor holds Postgraduate degree in Defence & Strategic Studies and War Studies from the National Defence University of Islamabad and the Balochistan University respectively. He is also a Graduate from the Command and General Staff College of Fort Leavenworth in the United States. Presently, he is working as the Vice President of CGSS and supervises research and analysis work. He also writes and speaks on various socio-economic and counter terrorism issues.



Dr. Muhammad Ashraf, Director General, Pakistan Council of Research in Water Resources (PCRWR)

Dr. Ashraf has more than 22 years of research experience in water resources development and management in arid and semi-arid areas and has a proven record of over 70 national and international research publications. During his professional career, he worked for the integrated management of water resources, particularly surface and groundwater resources of the irrigated and dry areas and is currently the Director General of Pakistan Council of Research in Water Resources (PCRWR).



Mr. Ahmed Kamal, Chairman, Federal Flood Commission



Mr. Ahmed Kamal is currently Chief Engineering Advisor to Government as Chairman Federal Flood Commission. Previously, he worked as Member (Chief Engineer (Dams Safety Council), Office of the Chief Engineering Advisor and Chairman Federal Flood Commission, Ministry of Water & Power Disaster Risk Reduction), National Disaster Management Authority.

Mr. Zakir Hussain Dahri, National Coordinator on Water Resources, Pakistan

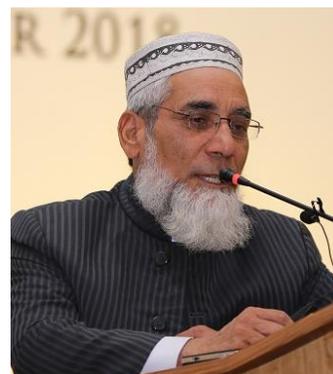
Agriculture Research Council (PARC)

Dr. Dahri is PhD (Climate Change and Hydrology), Water Systems and Global Change, Wageningen University and Research, Netherlands. He did his M.App.Sc. (GIS and RS) University of Melbourne, Australia. M.Sc. (Water Resources Management), CEWRE, UET, Lahore, Pakistan Dr. Dahri is the National Coordinator (Water Resources Pakistan Engineering Council) at PARC. He had been principle staff officer/program leader water policy and governance and climate change alternative and water resources institute,(CAREWRI), NARC. Besides, he remained scientific officer at PARC and senior / deputy director (Water Resources Natural resources division).



Dr. Muhammad Munir Ahmad, Director, Climate Energy and Water Resources Institute, National Agricultural Research Center, (NARC)

Dr. Ahmad graduated as Ph.D. Scholar in 1999 from Tokyo University of Agriculture and Technology, Japan. Won prestigious post doc fellowship awarded by Japan Society for Promotion of Science (JSPS), Japan from 2003-2005 at Department of Land and Environmental Engineering, Faculty of Agriculture, Ibaraki University. He has 30 (Thirty) years of Research and Development experience related to; Water resource management, Irrigation technologies, Management of sprinkler/drip irrigation systems, Climate change adaptation strategies, Evaluation of high efficiency irrigation systems, Watershed management, Water measurement and control devices, Ground water management, and participatory spate irrigation. Dr. Ahmad is author/co- author of 06 Books/Book Chapters and 37 research papers published internationally/nationally.



Mr. Waseem Anwer Baig, Management Consultant / COO, Baigmann Water Company, Lahore

Waseem Anwer Baig is a senior management professional with nearly 30 years of progressive experience in the field. He is a graduate of the Punjab University, Institute of Public Administration. He also serves as senior political analyst for multiple news outlets.

After spending more than 2 decades in the international marketing industry, Mr. Baig decided to devote himself to the pursuit of water purification. Originally conceived as a business venture, Baigmann Water Company has rapidly developed into

its own movement to educate, develop and improve. Mr. Baig recognizes the necessity to educate the masses, develop awareness and improve the state of water in our country. He regularly addresses public gatherings regarding the subject of Water Is Life, including gatherings of the Lion's Club, Rotary Clubs, and at different educational institutions. The company has installed hundreds of reverse osmosis water purification plants to date, and endeavours to work in association with thinkers, developers and charitable parties to advance the state of water in the country



Ms. Agnes Pompos- International Water Expert On Peaceful Water Sharing

Ms. Pompos is a young and dynamic international affairs expert, experienced in working in and with South Asian countries, driven to explore new challenges. Special areas of interest include water conflicts and peaceful water sharing, Pakistan's external relations, and human rights, with an emphasis on women's rights.



Opening Remarks by Lieutenant General Muhammad Zahir-Ul-Islam HI (M), (Retd) – Chairman CGSS



The session was hosted by General Muhammad Zahir-ul-Islam HI (M), (Retd) – Chairman CGSS. On behalf of the Centre for Global & Strategic Studies, he extended a warm welcome to the honorable speakers and participants of the event. While expressing his views on the pertinent topic, he conveyed the following remarks:

Pakistan, for quite some time has also been facing a host of non-traditional security challenges that have seriously impacted its development, growth, economic progress, as well as political stability. These non-traditional security challenges including environmental degradation, food and water scarcity and unprecedented population explosion merit urgent attention before they spiral out of control, posing a threat to the survival and development of Pakistan.

Water security is a global issue and the world faces daunting challenges. The ‘perfect storm’ scenario suggests that by 2030 the world will need to produce 50 per cent more food and energy, together with using 30 per cent more fresh water, whilst mitigating the causes of, and adapting to climate change. Water plays a pivotal role in how the world mitigates and adapts to the effects of climate change. An integrated view on water, the biosphere and environmental flows, is required to devise sustainable agricultural and economic systems that will allow us to decelerate climate change, protect us from extremes and to adapt to the unavoidable at the same time.

In recent years, Pakistan has suffered from severe water shortages, flooding and declining water quality. The worsening water crisis must be resolved if the country is ever to achieve stability and develop. Using water more efficiently is a necessary but insufficient strategy. Far deeper changes are required, including cultural and social paradigm shifts that will help the country evolve from a feudal society to a modern one. A blueprint for managing the water crisis is suggested that includes slowing population growth, increasing education, using less water in agriculture, and normalizing relations with India.



There is no single ‘silver bullet’ that can be adopted or applied to resolve the issues surrounding global water security; however, technologies and expertise that can aid us in confronting these problems already exist. What is required is the implementation of effective governance, financing and regulation, to allow technical solutions to take effect.

Engineers have the skills and technologies to develop effective solutions to many of the problems that surround global water security. In isolation these technologies and skills are not enough. It is incumbent on policy makers to articulate the issues surrounding water security to those outside of their usual sphere and must engage with economists, financiers, farmers, and industry and development agencies in order to build the public-political consensus needed to approach the problem of global water security.

Lieutenant General Muhammad Zahir-Ul- Islam HI (M), (Retd) concluded his opening remarks by stating that implementation by governments and public authorities of policies and strategic responses to water scarcity problems rely for their success on a positive response from individuals and communities. Existing values, cultural norms and organizational structures that either empower or disenfranchise individual citizens determine patterns of individual behavior and organizational response. He added that individual and institutional inertia may be difficult to overcome without raising awareness and understanding of the key issues and potential responses and making sure that these are firmly included in the broader public debate.



SESSION 1:

Keynote Address by Ms. Zartaj Gul – Federal Minister of State for Climate Change



Ms. Zartaj Gul expressed her gratitude to attend the seminar on Water Security: Issues/Way Forward on Aggression and Conservation. She appreciated the CGSS efforts on highlighting such an important topic and organizing a seminar for providing solutions to this grave international issue. She also acknowledged the contribution of so many distinguished guests and scholars

across the region to discuss the role of SCO.

Importance of Water

Clean drinking water is a basic human need. Almost 70% of the human body is composed of water which underscores the significance of this entity for life on earth. All the living things depend on water to carry on with their life processes; therefore, water serves as a key component of primary health-care facilities. Beside human consumption, adequate access to water for all the major sectors including; agriculture, commercial and domestic, is the top requirement of the modern world in which we live in.

Current Situation

It is painful to see Pakistan moving towards being a water-scarce country as the water availability per person has declined from 5000 cubic meters in 1951 to 1100 cubic meter in 2015. According to Pakistan Council of Research in Water Resources, Pakistan will become an absolutely water scarce country by 2025. Unlike the recommended water storage capacity of 1000 days, Pakistan's storage capacity stands at a meagre 30-day supply. Climate Change and water security nexus has further widened the supply demand

gap by reducing the available fresh-water in the Indus River which makes water resource management a complex problem. Lack of safe drinking water is a leading cause of threatening diseases among the people of Pakistan. In this regard it has caused a huge disease burden on the country's economy.

To analyze the reasons of water crisis in Pakistan, geopolitics and present situation, it is highly required that focused discussions should be initiated with the experts on water security and inherent elements while giving recommendations to alleviate the problem should be sought.

India's Water Aggression

Partition bestowed India with an advantage, as the headwaters were located in its territory, leaving Pakistan exposed to India's physical capacity to cut off vital irrigation water. As a result, India kept limiting Pakistan's share of water. Seeing the possibility of another conflict between the two neighbors, the international community plunged in to fix the Indo-Pak water crisis. With the help of the World Bank, both states eventually agreed to the Indus Water Treaty (IWT) in 1960.



Key Questions

What has gone so wrong that now India is flexing its muscles to terminate the treaty, or at least change it to increase Indian benefits? Is it mere electoral rhetoric ahead of the elections in India that motivated Modi to threaten IWT by saying “The government will do everything to give enough water to our farmers?” Or is India truly ready to now exercise its expanding military might? In any case it's a disaster for regional and world peace. In the presence of nuclear weapons, advanced ballistic missile programs, and huge armies

on both sides, a traditional war is highly unlikely between the two rivals. Instead, a water war is in the making, largely from India.

New Dams

Pakistan is experiencing immense water scarcity and building of new water storage projects is the need of the hour. Currently, we need two to three major dams to fulfil the current and future demands. However we are lacking the resources but with concerted efforts from the government and people of Pakistan we will achieve this goal. This is a test of our character as a nation where failure is not an option. Our future generation cannot endure the insecurity of water we are facing.

Conclusion

Solving the water scarcity issue in Pakistan demands multi-facet solutions. Our country is suffering from history's worst water crisis that requires coordinated efforts at multiple fronts; individual, community, tehsil, district, provincial and national. There is a need to create public awareness through capacity-building.

Speaker 1:

Ms. Agnes Pompos- International Water Expert on Peaceful Water Sharing



Ms. Agnes Pompos addressed the audience on the topic of “**Role of International Convention and Agreements in Peaceful Water Sharing**”.

In her speech Ms. Pompos highlighted the basic ideas and concepts of international water law, and shed light to why it is of utmost importance that countries accede to international water conventions and enter into regional agreements to govern their water management practices. These international conventions and agreements are instrumental to

promoting peaceful water sharing through cooperation as they provide a calculated framework for interaction. Her remarks contained the following important points:

Water is a resource essential to life. On average, the body of an adult human being contains 60% water and we need to constantly hydrate in order to keep this balance up and to keep our organs function to their best capacity. Water is so vital to the functioning of our body that it is safe to say, life is unimaginable without clean drinking water. Therefore, it is not surprising that access to water is considered a basic human right. The right to drinking water plays an increasingly important role in the international legal order.

To highlight the increasing viewpoint of the emergence of water as human right, Ms. Pompos mentioned a few international conventions and developments. Among the most recent recognitions, an independent expert on the right to water and sanitation was appointed by the Human Rights Council in 2008 and a resolution recognizing the right to water and sanitation was adopted by the UN General Assembly in 2010. The right to water, which entitles everyone to have ‘sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses’, has been included in various international human rights instruments, such as the 1979 Convention on the Elimination



of All Forms of Discrimination Against Women (CEDAW), the 1989 Convention on the Rights of the Child (CRC), and the 2006 Convention on the Rights of Persons with Disabilities. Other instruments provide implicitly for it, including the 1966 International Covenant on Economic, Social and Cultural Rights (ESCR Covenant). The protection of the right to access to water is an obligation of states during armed conflicts as well. This has been reinforced by the jurisprudence of international courts such as the ICJ, as well as UN bodies. The limitations on the access to water supplies indispensable to the survival of the civilian population are a violation of both international humanitarian law and human rights law.

Ms. Pompos then proceeded to speak about the most important properties of water, which are essential when discussing international water law. First of all, water is a finite resource. Surface water reserves cover some 100 million cubic kilometers of the earth's surface. Water circulates through the hydrological cycle. Nearly all of the water present on our planet is salt water and a large proportion is frozen or underground. Only one percent of the world's water is readily available for human use. It is not possible at this point of time to effectively produce more water, however it is true, that more drinking water can be created from sea water by desalination. Unfortunately, this is a long and often very expensive process, therefore it is not preferred.

Water is a resource widely utilized in agricultural, industrial, household, recreational and environmental activities. The pace of exploitation is growing exponentially as the population, industrialization and the effects of climate change increases. Water is a resource often wasted despite its importance; people are not very good at managing it. We waste water during our everyday activities.

It is of utmost importance to mention that water knows no borders (international water courses, lakes, groundwater reserves) and therefore must be shared amongst the riparian states. The surface water basins alone cover nearly half of the earth's land area and are also home to 40% of the world's population. Countless more watersheds cross sub-national jurisdictions. It is important to note that water resources are not equally distributed between geographical locations. South as well as Central Asia for the most



part is under constant water stress, while Central African and most of the South American countries enjoy an abundance of water supplies. Existing reservoirs are put under further stress due to growing populations, an expansion in industrial use as well as climate change.

Water: A Source of Conflict or Cooperation?

Fierce competition for fresh water may well become a source of conflict and wars in the future (Kofi Annan, March 2001).

But the water problems of our world need not be only a cause of tension; they can also be a catalyst for cooperation. If we work together, a secure and sustainable water future can be ours (Kofi Annan, February 2002).

Ms. Agnes Pompos also talked about whether or not water will contribute to the eruption of conflicts between states, since watercourses and groundwater reserves are largely interconnected due to the nature of water. She highlighted that the Oregon State University's Trans-boundary Freshwater Dispute Database (TFDD) has most recently identified 286 surface water basins that cross international boundaries. In addition, the International Groundwater Resources Assessment Centre has identified 592 trans-boundary aquifers. Of course one must mention that different countries and regions may have different ideas and interests tied to the utilization of water which may lead to conflicts in the absence of basin agreements.

It is widely debated that the next world wars will be fought over water, as it is so vital yet limited in quantities. Let's have a look into the types of conflicts linked with shared water resources;

- **Horizontal Conflict:** Describes a disagreement generated by differing priorities in the utilization of water. Entity A might want to build canals in order to divert water to rice fields, while Entity B, the lower riparian would like to generate power with a large hydropower station. How to use water (also conflict between users, agriculture vs. power within countries). Since Entity B is the lower riparian it might not have enough water supplies to fuel power production.
- **Vertical Conflict:** These are conflicts between present vs. future and uses no hierarchy. For example: Entity A may wish to abstract groundwater beyond the extent of the normal recharge, which would hinder the access of future generations if the groundwater reserve dries up.
- **Diagonal Conflicts:** Conflicts which are not directly linked with water resources but are erupted by secondary effects on the water body's ecosystem (Costa Rica vs. Nicaragua on San Juan River).

Cooperation: What sort of benefits may be reaped from the Cooperation of Riparian States?

Cooperation enables better ecological management, providing benefits to river, aquifer, lake, wetland and related ecosystems as well as adjacent estuaries, coastal areas and seas. It also underpins important further types of benefits, some of which are not readily apparent or properly taken advantage of. For example, efficient, cooperative management and development of shared waters and adjacent flood plains can yield increased food and energy production; improved irrigation can contribute to poverty reduction and help control migration from rural areas to urban centers. And trans-boundary early-warning systems can minimize loss of life in the event of floods. A third (political) benefit derives from the easing of tensions due to cooperation. Finally, as international waters can be catalytic agents, a fourth benefit is improved economic integration between States. Trans-boundary water management can thus directly or indirectly contribute to international

trade, economic development, food security, political security, poverty alleviation and regional integration.

Have there been major conflicts over water?

A simplified answer is yes, there have been conflicts but no wars. Ms. Pompos referred group of researchers at Oregon State University under the Basins at Risk project compiled a massive database of every historic event with relevance to water in the past 2500 years. They found that cooperation outnumbered conflicts by more than two to one from 1945-1999. But, the researchers found no events at the extremes of the intensity scale. There have been no declarations of war, and no countries have ever unified into one nation over water.

Ms. Pompos explained that there was found no events at the extremes of the intensity scale – no formal declaration of war over water and no countries voluntarily unifying into one nation over water. For the years 1948 to 1999, cooperation over water, including the signing of treaties, far outweighed conflict over water and violent conflict in particular. Out of 1,831 events, 28% were conflictive (507 events), 67% were cooperative (1,228), and the remaining 5% were neutral or non-significant. More than half of all events (57%) represented verbal exchanges, either mildly conflictive or cooperative. Interactions follow the same pattern, with 17% conflictive, 78% cooperative, 5% neutral, and verbal exchanges accounting for 54% of total interactions.

International freshwater treaties, which are the most cooperative events in the dataset covered a wide range of issue areas, with an emphasis on water quality and quantity, hydropower, joint management, and economic development. The most extremely conflictive events in the database, extensive military acts, concerned quantity and infrastructure exclusively, two closely related issue areas.

In addition to this Ms. Pompos said that while further analyzing the data, the scientists, Mr. Aaron T. Wolfe, Ms. Shira Yoffee and Mr. Mark Giordano found that international disputes over water-related issues do not typically cause violent



conflict, however, they have led to interstate tensions and significantly hampered development, for example along the Nile, Mekong, Euphrates, Amu Darya, Syr Darya, and Ganges rivers. And while conflicts often remain local, they can also impact stability at the national and regional levels.

It is not the shortage or lack of water that leads to conflicts but how water is governed and managed. To regulate water use and enable sustainable and equitable management in areas stricken with water shortages, stronger policies need to be put in place. Unfortunately, water management institutions, especially in developing countries, often lack the human, technical and financial resources to develop and implement comprehensive management plans that can properly accomplish the installation of sufficient governing mechanisms. A precedent of coordination between stakeholders, through the establishment of institutional capacity in the form of agreements, treaties or informal working relationships, can help reduce the likelihood of conflict

In politically unsettled regions, water is often essential to regional development negotiations that serve as de facto conflict-prevention strategies. We have been witnessing in the past year or so, how the political will to solve a decade's long water conflict in Central Asia has been a catalyst for strengthening of ties and boosting economic relations. Although Uzbekistan, Tajikistan and Kyrgyzstan are not completely out of the bush yet, things are looking better than ever, since their independence.

What are the most important international conventions and agreements?

There are a number of conventions that touch on different aspects of water and there are over 400 basin-specific agreements. Still, 60 percent of the international watercourses lack cooperative management arrangements, and the majority of the agreements are bilateral, even where more than two states share a particular watercourse. Additionally, many watercourse agreements only partially cover key principles, such as emergency situations, protection of ecosystems, data-sharing, consultation and negotiation, or dispute settlement.

The most important international conventions on water are the following:

- 1992 Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes (Water Convention)
- 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention)

The Watercourses Convention and UNECE Water Convention are complimentary instruments. The biggest differences between the two are not found in their contents, but rather the level of detail they are giving on different subjects. For example, the UNECE Water Convention talks more in depth about regulations, standards, and joint bodies and so on, while the Watercourse Convention focuses more on the principle of equitable and reasonable utilization. The two conventions are view to be complementary, and not contradictory.

The basic governing principles under the conventions are: equitable and reasonable utilization and the obligation not to cause significant harm. Furthermore, co-riparian's are encouraged to cooperate. Let's see what this means.

Equitable utilization is governed by the principle of sovereign utilization of the watercourse which stipulates that every riparian State has a right to the utilization of the watercourse which is qualitatively equal to the rights of the co-riparian's. However, this must not be mistaken for the right to an equal share of the uses and benefits; nor does it imply that the water itself has to be divided into equal shares.

The principle of equitable and reasonable use recognizes equity as a broader umbrella under which the concept of reasonableness becomes relative. This means that what may be considered to be perfectly reasonable by one State can be inequitable when looked at within the broader picture of the whole watercourse and the various needs and interests of co-riparian States. Hence, “reasonable” uses are still subject to an “equitable” allocation. Reasonableness also differs from the concepts of “beneficial” or “best possible” use. It encompasses the contemporary conception of rationality and takes factors such as the socio-economic development of a State into consideration. Yet, even if a use of an international watercourse has been identified as reasonable, it might still be challenged when balanced with other uses through the lens of equity.

What are the relevant factors? Since the principle of equitable and reasonable utilization is rather general and flexible and the use of the watercourse is not based on the notion of equity, the concept demands the weighing and balancing of the competing (reasonable) interests of States; taking into account all relevant factors and circumstances. Most uses are not static hence changing scenarios with changing natural conditions can trigger a need to reconsider the relevant factors in each case. The Watercourses Convention provides an indicative list of the key factors and circumstances to be taken into account when determining what constitutes an equitable and reasonable use. Some of the factors included on this list are current and future uses, the size of population dependent on the watercourse, hydrological and geological factors etc.

The obligation not to cause significant harm requires States in utilizing an international watercourse in their territories, to take all appropriate measures to prevent the causing of significant harm to other watercourse States. It derives from the theory of limited territorial sovereignty. The theory of limited territorial sovereignty stipulates that all watercourse States have an equal right to the utilization of a shared watercourse but they must also respect the sovereignty of other States to equal rights of use. This principle is widely accepted as the foundation for the law of international watercourses.

Importantly, the duty “not to cause significant harm” is a due diligence obligation of prevention, rather than an absolute prohibition on trans-boundary harm. Hence, a state’s compliance with Article 7 is not dependent solely on harm being caused, but rather

determined by a country's reasonable conduct in terms of preventative behavior to avoid the harm in question.

The principle of equitable and reasonable utilization entitles a watercourse State to an equitable and reasonable share of the uses and benefits of the particular watercourse, and also creates the reciprocal obligation not to deprive other States of their respective rights in this regard.

The no significant harm rule requires that States, "in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States



Each state has a right to use waters, but this right is based on equitable and reasonable utilization not territorial sovereignty as watercourse is not property. The volume that can be utilized by each state is defined by specificities,

circumstances of each individual watercourse. A non-exhaustive list of factors provided in Watercourse Convention, which includes geography, hydrology, social and economic needs of riparian's, existing and potential uses, population dependent on watercourse.

Trivial harm, perceptible harm has to be tolerated if it can be justified by the co-riparian. The "significant" threshold excludes mere inconveniences or minor disturbances that States are expected to tolerate, in conformity with the legal rule of "good neighborliness". This means that the right of each state must be protected to exercise equitable and reasonable use.

The above is based on the idea that full benefits may be reaped by cooperation only. Riparian's form a community of interests, where every party is interested in the "wellbeing" of the watercourse, since they are all dependent of it. As different states may have different interests, they may wish to utilize the resource in different ways, but in order to achieve best results riparian's must enter into discussion, cooperation. Water sharing is not a zero sum game, every riparian's interest must be taken into account, as they are all equal. Of course, cooperation is only possible if there is trust among the members of the community of interest.

In line with the above, both the UNECE Water Convention and the UN Watercourse Convention urges states to cooperate in good faith, in as many ways as possible. States shall enter into bi- and multilateral agreements to best manage watercourses. They shall establish joint bodies and commissions, share information on quality, volume, pollution, floods etc., draw up plans for management and utilization of water resources etc. As the community of interest approach prevails, a higher and higher stage of cooperation is perceived to be desirable, which includes shared governance, joint action and development throughout the watercourse and the whole basin. This allows benefit sharing, where action provides benefits to all riparian's, both upper and lower. These benefits include positive impacts on the environment, sustainable development and utilization of resources, industrial development and power generation and the list goes on.

It has been argued that equitable and reasonable utilization subordinates the no significant harm rule, which significantly slowed down the process of entering into force of the Watercourses Convention as it was viewed as a bias, a way to favor upper or lower riparian's. Literature has undone this myth. The supremacy of the principle of equitable and reasonable utilization over no harm rule should in no way be viewed as favoring upstream riparian's. The principle of equitable and reasonable utilization duly recognizes, and is based on the equality of all riparian's in the uses of the shared watercourse. It further lays down certain objective factors for determining the equitable and reasonable utilization for each riparian state, and these factors include existing uses.

There is a widely believed, but inaccurate notion that only upstream riparian's can cause harm to downstream riparian's by affecting the quantity and quality of water flows to such downstream riparian's. This belief is actually one of the basic misconceptions about international water law in general, and the Convention in particular.

It is a common mistaken belief among a large segment of lawyers and non-lawyers that harm can only 'travel' downstream, and it is not recognized that upstream states can also be harmed by activities by downstream states. Downstream riparians can be harmed by the physical impacts of water quality and quantity changes caused by use by upstream riparian's. It is much less obvious, and generally not recognized, that the upstream riparian's can be harmed by the potential foreclosure of their future use of water caused by the prior use and the claiming of rights by downstream riparian's. This is an important, albeit not widely understood, principle of international water law that establishes a clear linkage between the principle of equitable and reasonable utilization, and the obligation not to cause harm.

Cooperation

What are the measures that the conventions encourage the co-riparian's to take? Ms. Agnes Pompos gave a non-exhaustive list which can serve as a way forward. These are:

- States are encouraged to set up joint bodies and commissions
- To Exchange data on the condition of water
- Notify co-riparian's about planned measures > environmental impact assessment (In order to be able to determine the effects of planned measures, riparian's have to notify each other well in advance and discuss, negotiate the terms of these project in order to achieve ERU)
- Take joint measures in order to Protect and preserve the ecosystem
- Reduce and control pollution
- Standards, harmonized policies, consult on measures
- Construct and maintain flow regulation instruments

Importance of Conventions

Ms. Pompos mentioned why these Conventions are important. She said that Conventions aim at promoting the optimal and sustainable utilization of water resources for present and future generations. The Conventions address such utilization through some basic procedural and substantive rules and underscore the specific characteristics of each watercourse by leaving the details of the agreement to the riparian states concerned. More importantly, the Convention enshrines the principle of equitable and reasonable utilization under which each riparian state has a basic right on the shared watercourse.

Conventions are important because the most important principles of customary law are codified in the Conventions. Although only 36 states are thus far parties to the Convention, the principles of the Convention are binding on other states as well because of the fact that these principles reflect customary international water law.

Their importance also lies in the fact that they create a framework, a template for existing and future basin agreements. Although signing a treaty does not guarantee a future of stable cooperation, it nevertheless provides states with a structured means to organize their affairs and manage disputes in an attempt to avoid conflict. Treaties alter states' behavior, their respective relationships, and their expectations of one another, creating a framework for extended interaction. Agreements help states coordinate their actions, especially when unilateralism fails to sustain a mutually satisfying outcome and to prevent free-riding

These Conventions lay down the basic principles, such as equitable and reasonable utilization, no significant harm, coordination of uses, sharing of information on possible disasters and the overall condition of the waters, due diligence. Conventions 'provide a good basis for further negotiations. It leaves the specific rules to be applied to individual watercourses to be set out in agreements between the States concerned, as has been the current practices.

International and regional judicial and arbitral tribunals can rely on, and be guided by the principles of the Convention. Likewise, international financial institutions also now have a credible reference treaty for the projects on international waterways they plan to

finance, especially with regards to notification of other riparian's of such projects. Most important of all, it creates awareness of the importance and benefits for cooperation and prompts states to engage, cooperate and coordinate.

Case Study: A Successful Water Allocation

Finally, Ms. Pompos provided an example of the positive effects of water sharing between two countries. Water has the potential to bring countries together and strengthen political bonds, as can be seen in the case of the LHWP treaty between Lesotho and South Africa. The Lesotho Highlands Water Project Treaty (LHWP) of 1986 effectively reduced political tensions between Lesotho and South Africa. There were political tensions because Lesotho is a small country completely surrounded by a more powerful country, South Africa, and also because Lesotho opposed South Africa's apartheid system. The two countries made an agreement to allocate the Orange River, which originates in Lesotho and flows westward across South Africa. South Africa is much more developed than Lesotho and needed water to fuel its agricultural and industrial development. Lesotho, on the other hand, wanted to start developing and needed economic aid and electrical power but did not have sufficient infrastructure to develop its water resources. However, Lesotho receives higher amounts of precipitation than South Africa and has abundant water – its surface water is estimated at 4.73 cubic km per year which greatly exceeds water demand. Yet less than two percent of Lesotho's estimated renewable water resources are extracted on a yearly basis.

In 1978, a team of experts, including government officials and consultants, from both countries collaborated to conduct feasibility and cost analysis studies. Finally, in 1986, an agreement was reached between Lesotho and South Africa and led to the creation of the Lesotho Highlands Water Project. According to this treaty, Lesotho would supply water each year to South Africa according to volumes determined by a mutual agreement between each country. The treaty was mediated by the World Bank. By the end of the project in 2020, the flow of water from Lesotho to South Africa will be 70 cubic meter per second for an estimated amount of 2.207 billion cubic meter of water per year. The redirected water coming from Lesotho is used to generate electricity (72 MW) prior to reaching South Africa.

The LHWP treaty was able to satisfy both Lesotho and South Africa and provide an equitable allocation based on the needs of the two countries. The LHWP treaty outlines a plan for the construction of a system of five dams and 200 km of tunnels to transfer water from the Orange River in Lesotho to the Vaal River, and bring water to South Africa's heavily industrialized and economically important Gauteng area. In return Lesotho receives hydroelectric power it sorely needs and economic assistance in terms of yearly fees of \$46 million paid by South Africa. This treaty was successful in increasing the stability of the region, stimulating the economy, and creating social benefit through the implementation of the world's largest water transfer project.



Speaker 2:
Advocate Ahmer Bilal Soofi – Former Federal Minister of Law,
Justice and Parliamentary Affairs



Advocate Ahmer Bilal Soofi- Former Federal Law Minister conveyed his gratitude to CGSS for giving the opportunity to speak to the learned audience. He addressed the audience on the topic of “**Indian Violation of Indus Water Treaty**”. His speech comprised of the following remarks:

The Supreme Court of Pakistan is mainly focusing and emphasizing on the water preservation and the management of water resource. It is also looking upon the ground-water and its management. It has also called the bottling companies in order to introduce some sort of a provincial tariff on the utilization of the water resource which has been extracted from ground as Pakistan is a water stress country.

The Indus Water treaty is a subset of international water law is a new revolving area or a subset of international law while we talk about relations between states, we talk about treaties and various, prohibition of use of force and prohibition against the threat of use of force as being violate of charter and the principle in the charter has enunciated. We do not talk about the same way of use of water as a possible threat to use of force as blockade, its use, its release and all infrastructure associated with that as an element where a one states can use it as coercive mechanism against the territorial independence of another states.

Since the use of water in 1945 when the charter came to existence was not identified as a stand-alone human right but it begun to evolve as a stand–alone human right with ICCPR which is International Covenant on Civil and Political Rights and another covenant relating to social, cultural and economic rights that economic rights are integrated with the right to life and right to use of water and equitable use of water. It was also recognized that water has to be divided upper and lower riparian where the water course passes

through various states; there are so many examples of such states where one river is being shared by several states. The treaties which were entered into a bilateral level or multilateral level for developing the shared methodology of the water courses flowing between various states are the treaties which are sources of international water law; they generate the jurisprudence of international water law and they are the treaties for example in Africa, we have over 187 such treaties between various upper and lower riparian states which provides for various formulas and various approaches. Those approaches become a case study for international water lawyers to examine in the given circumstances with this kind of a water flow what should be the framework of water



sharing itself.

The International water law is developing at a very serious space elsewhere in the world. Pakistan have been oblivion to that; has not concentrated in the development neither has it have kept pace. If we look at past 10 or 20 years we hardly find any thesis coming out in PhDs or MPhil, relating to International water law developing. We have not invested in that including our entities which are related with in the government to this area whether it's ministry of water in power, whether it's any other entity, a commission or a committee have not a thought of making an investment in HR relating to the development of water law which has strange omission. On the one hand we have strategic interest tied

up and on the other we are choosing not to invest. If not choose to invest in R&D, or into any area we will suffer; I submit to the audience that international water law is far beyond the treaty is growing and what treaty is becoming far less important in the larger parameters.

Speaker 3:
Mr. Ahmed Kamal, Chairman, Federal Flood Commission

Mr. Ahmed Kamal, Chairman, Federal Flood Commission addressed the audience on the topic “**Main Streaming Disaster (Flood) Risk Reduction in Water Sector**”. His speech includes the following features:



Pakistan’s Geographical Setting

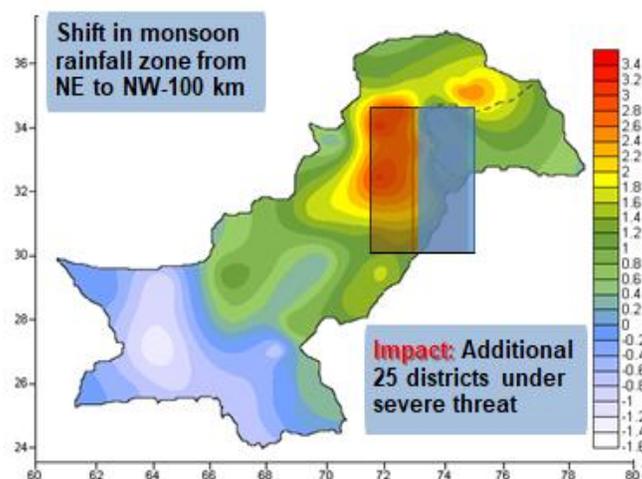


Pakistan has diverse topographical features, with extreme climatic variation. Soil erosion caused by 2008, and 2015 earthquakes was enormous. The international panel of climate

change has confirmed a global increase in temperature of 1.4 to 1.6 degree centigrade. In fact the seasons of 2016 and 2017 were considered the hottest years in the earth's history. Climate change has hugely impacted the monsoon seasons, caused the melting of our Himalayan glaciers.

Climate change and disasters pose severe threats to sustainable socio-economic development. Current development practices are not fully considerate about climate change and disaster risks.

Impacts of Climate Change - Pakistan



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Pakistan also faces increased floods and droughts, as well as a sea water intrusion. A study was undertaken in 2005, under the Chief Executive of Pakistan that proved that Ravi and Sutlej are not perennial anymore because of the construction of so many upstream structures. This means legislation should be made to ensure river movements downstream. Pakistan needs to manage water resources so they are not wasted when it is plentiful and available when there is water scarcity. Disaster Risk reduction (DRR), which is the measure taken to prepare for floods, need to be implemented.

Impacts of Climate Change - Pakistan

Increased temperatures - Period 2016-2035 (IPCC AR5)

▪ Global vs Pakistan – Decadal Mean Temperature Trends

Period	Global	Pakistan
1901-2000	0.06 °C	0.06°C
1956-2005	0.12 °C	0.16°C
1971-2005	0.15 °C	0.26°C
1981-2005	0.17 °C	0.39°C
1991-2005	0.33 °C	0.74°C
2010-2039	0.7°C*	1°C

▪ The mean temperature rise after 1950s over Pakistan is twice as fast as the global mean change

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Pakistan's floods have cost 18 billion dollars in terms of economic damage, and displaced large populations. Heat waves have also done enormous damage. In addition, sudden harsh rains have caused destruction. Pakistan needs to develop tools for disaster risk reduction. Another problem is the sea level of the Arabian Sea is much higher leading to a receding coastline which has led to Pakistan's regions of ocean under international law becoming smaller and smaller. Variation in rain patterns calls for a strategic approach to climate change. Pakistan's temperature has consistently risen above the overall rise in temperature. The government should make the following changes:

1. Dams and barrages should be built to contain floods. Supplement available water resources through construction of Small & Medium dams.
2. Improve overall irrigation efficiency to save water to ultimately cater for the drought like conditions in future.
3. For water management large reservoirs should be built, improve water usage practices, improve irrigation infrastructure, line the canals.
4. A 'water accounting apparatus' is needed, as right now Pakistan is losing too much water and no one knows where it is going. Our current capacity is so limited that finding key information on things like the discharge value of barrages is hard to find.
5. To control the floods in the country, following measures must be adapted. These are:

- Maximum utilization of flood flows hill torrents for localized irrigation and other socio-economic activities;
- Community Participation approach for flood preparedness, fighting and rehabilitation
- Flood retardation and water conservation through construction of multiple storages and flood embankments
- Updating the flood operation manuals of dams and refinement of flood flow/rainfall computer models for “Indus River System”.
- Effective monitoring system in Gilgit-Baltistan to forewarn communities of glacial movements
- Flash flood monitoring system



6. Dams and barrages are essential. Every year these structures are not being maintained. In fact there is no contingency plan to deal with Mangla and Tarbela.
7. Water decision support system and mitigation steps on the ground are needed. We have failed at ensuring our water security vis-à-vis India. We need 20 to 30 member teams to inspect vulnerabilities in our water systems, and to take our case into international courts if India violates the Indus Water Treaty.
8. Effective coordination of policies and activities of relevant agencies should be undertaken, which impinge on conservation and sustainable use & management of watersheds including soil, water and vegetation.

Speaker 4:
Major General Hafiz Masroor Ahmed, (Retd) – Vice President,
CGSS



Major General Hafiz Masroor Ahmed, (Retd) – Vice President, CGSS addressed the audience on the topic “**Indian Water Aggression in South Asia**”. His speech includes the following points:

The subject of water is of utmost importance to us from the point of view of agriculture, environment, economic and military relevance. He highlighted essential aspects of the subject without going in details of previous projects India is undertaking in Indian Occupied Kashmir on Western Rivers of Indus Water System elsewhere in the country and also in some neighboring countries. One of the problems India is confronted with and which has an influence on Indian Decision Making on domestic as well as international front. India is a regional power with number of big in her credit. India certainly is a leading democracy in the world and has a big land mass construction of the Marshyandi Hydro project in early nineties leading to a confrontation between King Birendra and Prime Minister Rajiv Gandhi.

Bhutan

Indian approach towards Bhutan is similar to that of Nepal. As a powerful lower riparian state it does not let Bhutan construct water storage facilities. However, because of discriminatory treaties India constructs and operates hydro power projects in Bhutan and interestingly purchases electricity from own projects in Bhutan.

Afghanistan

Coming over to the Afghanistan, Afghan authorities with the help of Indian experts have completed the feasibilities and detailed engineering of 12 hydro power projects on River Kabul with a capacity to generate 1200MW of electricity. If these projects get completed,

they will store 4.7 Million Acre feet of water by squeezing the flow in the river reaching Pakistan-India plans to assist Afghanistan in this initiative, as it will adversely impact Pakistan. The World Bank will provide funding for these projects, which will cost \$7.1 billion.

Here two important questions are raised;

First question is as to why India has been so unreasonable, non-receptive and non-accommodative or at the least not gracious enough to oblige her smaller neighbors that are Bangladesh, Bhutan and Nepal. Despite the fact, these countries are absolutely in a cooperative mode indeed to the extent of being states pliant to India.

And the second question is as to why India is so supportive of hydro power projects on River Kabul in Afghanistan. If we disregard 'Chankaya' Theory for a while Afghanistan is a distant neighbor of India ethnically, Afghans are not cousins of Indians, there is no religious bondage and there are no socio-political and linguistic commonalities.



Answer of first question is “The Hindus have a typically ‘Banya’ mindset which is, ***‘hold whatever you can hold, hold till whatever the length of time you can hold, hold it tight and do not give it to anyone (Bangladesh, Nepal or***

Bhutan) even if they need it badly and you do not need it all. Put it in a Tejouri (safe) and sit over it.'

Answer of second question is even simpler. Do whatever you can do, whatever way you can do directly or indirectly anything which harms and weaken Pakistan.

Coming over to Indo-Pak disputes violations of Indus Water Treaty (IWT) and Indian water aggression therein; partition of the sub-continent in 1947 split and established irrigation system between India and Pakistan, without specifying how the water were to be divided and shared. Being upper riparian, India got control of water supplying Pakistan's irrigation canals and it diverted some of the waters away from Pakistan, as early as 1948. Water to Dipalpur canal which was shut at Ferozpur Head works and crystallized vulnerability of Pakistan. Thereby, making it essential for Pakistan to have a few binding agreements on access to water resources which originates from India. Resultantly, during the height of Indo-Pakistan tension in 1948 Islamabad sent a ministerial delegation to Delhi to negotiate the restoration of water. New Delhi got Islamabad's recognitions of its rights to all the waters in the eastern rivers and secured from Pakistan its commitment to pay for any water supplied by India till Pakistan could find replacement from western rivers.

Then came the much talked about Indus Water Treaty and situation resulting from this was considered to be win-win for all. However, India started contemplating its violation within a decade. It is pertinent to highlight here that success of treaties agreements and contracts depends upon the will and intent of the signatories. If the intention of the one signatory is wrong from the outset or it is changed subsequently, it will always be able to find a loophole or space for interpretation or misinterpretation in its favor and that is exactly what India did in case of Indus Water Treaty.

The issue of Wullar Barage came up in early seventies followed up by Bhagliar Dam on Chenab River, Kishangana project on Neelum River and number of other projects on Western Rivers. Pakistan contested some of these projects with limited success due to Indian machination and clout and also our inability to protest and contest the way we

should have done. General pattern of Indian approach towards construction of controversial projects has been no prior consultation with Pakistan, no sharing of information and delaying tactics in provision of data / information. When asked not, allowing Pakistani officials to visit controversial sites taking undue time in evaluation of Pakistani proposals and counter proposals coming up with modified designs more objectionable than the previous one and so on.

In a nutshell, India displayed resolution to successfully execute controversial projects and there is a much room of under construction planned and conceived projects on Jhelum as well as Chenab River. 41 have already been completed, 12 are under constructions and 155 are being planned. The cumulative effect is the capability to control, and manipulate the water in a way that is disastrous for Pakistan and advantageous to India.



If India had under taken the projects within the parameter stipulated in Indus Water Treaty only it would have been taken as a fair deal and her right. If it had under taken only the hydro projects particularly run of the river only it would have been okay. If some of the projects included irrigation of agricultural land within the same valley that would have still been okay. But, if India is always looking for possibilities and feasibilities of diverting water from one valley to another from Neelum River to Wullar, from Chenab River to Beas, it is a sheer water aggression and needs to be taken as such. If element of aggression

was not there why would India violate Indus Water Treaty and even the widely accepted International Laws on water resources. Obviously, her intent is to de-stabilized weaker Pakistan through water aggression effects which are:

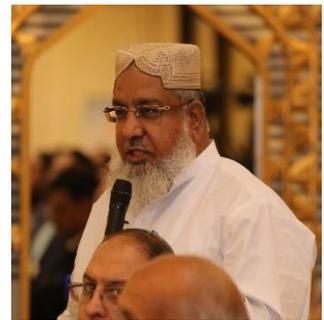
- a. In the first place, India can use it as a geo-strategic weapon to intimidate Pakistan.
- b. In order to complete these projects, India will have to cut innumerable trees, clear large forests at many sites with pronounced environmental impact. This will affect Pakistan's water resources due to environmental degradation and increased sediment flow.
- c. These mountains of concrete can have disastrous natural calamities as the area is prone to large scale landslides and earthquake. In any case, Indian Dam failure record is not good as nine of its dams have so far collapsed.
- d. Chenab River provides water to 21 canals and irrigates about 7 million acres of agricultural land in Pakistan. If India stops water flow, even for a limited time our farmers will be left high and dry. As an end result, our yield will reduce when elsewhere including India per acre yield is already higher than us and ever increasing.
- e. Hydel power production at Mangla will reduce and depletion of the Dam will be hastened.
- f. Water control capability gives unique leverage to India, to stop water when we need it and release it when we do not need it. India can release huge quantity of water to cause flood, damage or standing crops and destroy infrastructure including our canal system.
- g. In case of war, India can inundate places for her choosing and dry up our canals along Indo-Pak border to create desired military effects through a deliberate water maneuver.
- h. In worst case scenario, agriculture and electricity aside, Indian blockade of water to Pakistan will tear apart Pakistani social fabric as there will be a sever reduction in productivity and millions of people will be deprived of food and water. Riots in large cities and towns may erupt and this would jolt the law and order situation in the country.

To conclude, the intent and capability are two strands of the perception of any threat. If your enemy has the intent to harm you but does not have the capability to do so, he cannot do anything, till the time he develops such capabilities. Contrarily, if your enemy has the capability but not intent to attack you, intent can change at any time. In this case, India has the intent and is in the process of developing capability also. Therefore, threat from Indian water aggression is real.

Question and Answer Session (Session 1)

Question 1: Mr. Muhammad Fayazz – Representative National Agricultural Research Centre (NARC)

1. How can we identify the discrimination of use and misuse of water in intra-provisional level and inter regional level and what would be the measured system of water security?
2. Which water intelligence agency is working in all the organizations?



Answered by Advocate Ahmer Bilal Soofi



We should look upon the discrimination of use and misuse of water in intra-provisional and inter-provisional level deeply and a proper research should be conducted in this matter.

It would be called water diplomacy between India and Pakistan on the issues which are highlighted whether we can use or pursue minimum water flow in the three rivers which may require whether its security, environment or other related issues. Both countries should talk to each other on the matter of climate change or one should establish a legal water framework or diplomacy where we are discussing and debating under the Indus Water treaty framework in first basket approach. As I mentioned before about the first basket approach both have to take start off collectively but the other water cooperative measures and the effects like climate

change on the Himalayas and other regions is something we need to open up a dialogue and we should discuss these matters accordingly to reach to a certain solution.

The first point of construction of dams has an effect on the reservation priority there are some pros but there are not common pointers in terms of scientific area. I have come across to a study of that argument that if constructing dams have a correspondent effect on the reservation priority and the threshold of the policy.

The second point regarding Afghanistan. I believe that the dispute that are compact to the nature, do not wait for the perfect consensus to hammer a treaty but notwithstanding with Afghanistan and Pakistan a draft treaty from prevailing and present it to the authority to view it accordingly and that's why the specie of legal water diplomacy is being missed out. So, in the international level you have to wait for the political consensus where a legal draft should be set for the resolution. A group of lawyers, expertise and technical work should be brought from both Pakistan and India and that is how the political conspiracy can prosper.

Comment by Mr. Munir Ahmed – Representative Pakistan Agricultural Research Council (PARC)

As India has used a part of us and lacked in facilities, now as India is using part of their water from everywhere, and according to the second basket approach we must build a team of lawyers or advocates to endorse the laws or technical persons that how to utilize the water wisely.

Comment by Mr. Abdul Karim – Representative Pakistan Agricultural Research Council

As there is an influence of dams in the Water provided to the south as we are in the environmental aspect a negative influence in the ecological system and several aspects were in the debate of flow of water and resources and in the next few years this would a threat to other neighboring countries likewise Afghanistan.

Question 2: Mr. Tahir – Journalist 24 News, Islamabad

Who stops Pakistan from constructing dams in this particular?

Answer: As mentioned before that lower riparian has a responsibility to preserve out water resource, we should look upon various option we have already, we have other option of public private partnership in 2013 which permits the second authority which can grow for crowd funding where there is a group of concentration and innovation to interact, it may have a temporary liquidity and also have a complete control over the asset and property right.

Question 3: Ms. Ayesha Khan – Chief Executive of Civil Society Collation for Climate Change

1. If it is an engineered treaty the then why is it not a violation, why Pakistan is always told to go to the International Court of arbitration over the neutral experts? And we have lost whenever we did that.
2. What will be the global scenario and what will be the economic benefits with upper to lower riparian?



Answered by Advocate Ahmer Bilal Soofi

In this case the International arbitration taking out matters again which is hardly defined the use of water as we have continuously failed the case. One reason is the technicality which is not conformity what the Indus Water treaty defines. We failed on one witness but we do relief on one aspect

Other question of global security issue has been handled by the international community as environment is the global common and when we go to the international court we should propose this treaty as a global concern regional approach. There is no harm in creating a greater amount of actors involving in this treaty as there is an integration of geology and geography.



Ms. Agnes Pompos Added that the Indus Water Treaty is basically a technical approach as we consider those facts in 1960's in which the facts and figures were not clearly identified due to its non-permanent locality.

Session: 2 (Water Conservation)

Speaker 1:

Mr. Zakir Hussain Dahri, National Coordinator on Water Resources, Pakistan Agriculture Research Council (PARC)



Mr. Zakir Hussain Dahri delivered an inclusive speech on the topic “Surface storage and Groundwater Recharge in Pakistan” by extensively elaborating the sources of groundwater, its consumption in agricultural sector and certain challenges in water management. His speech comprised of the following remarks:

The interventions are expensive and somewhat controversial, and we have deposits accumulating in dams. However, Pakistan is blessed with ground water, with a resource value of 1620 MAF. The safe yield (the discharge and accumulation of water for sustaining the ecosystem), is 55 MAF/year. Technological solutions are required to address the water imbalance. Inland storage is also another source which can be used for storage of water and later on utilized. In the rivers the maximum flows are double than the minimum flows, and the Kharif season flows are 5-fold than the Rabi season flows. The phenomenon of flooding and droughts are recurring. The current storage capacity of 14.7 MAF is only about 11% the mean river inflows.

There are some kind of myths associated with water resources in Pakistan. The storage capacity of the river water in Pakistan is only about 30 days, which is less than other countries. However, the huge water storage in the glaciers and the ground water (aquifers) is not taken into account. Another common myth is that the per capita storage capacity of less than 100 cubic meters is lowest relative to the other river basins in the world. However, there are countries which have less water but are doing well and others with more water but are doing worse. So, the solution lies in the efficient water governance.

According to another school of thought, Pakistan is a water rich country and they say that we are at the 9th number in terms of renewable water resources. The focus needs to be shifted from scarcity to water demand management, and the gap between the water supply and demand is the determinant of the water scarcity level. Groundwater is not actually a resource, but it is the accumulation of water through various natural processes. The groundwater average annual recharge is 55 MAF, and of it only 36 MAF is utilized. Other areas which come under the marginal zones (19 MAF) where the water is underlined by saline water. However, there are some areas in South Punjab and Sindh where the groundwater has formed over the native saline water. It can be sustainably extracted through technology and management studies. The Indus Basin irrigated plains are underlain by an extensive and highly transmissive (which transmits and store water) in an unconfined water aquifer. One third of these aquifers, has fresh water, and one tenth of it has moderate salinity content, while the remaining is highly saline. The groundwater resource is mostly non-controversial, and is the by-product of the agricultural activities carried over the centuries. However, the resource is severely threatened by over exploitation and pollution from the wastes released from industries. There have been



efforts to recharge the groundwater, and this technique can be used where it is feasible. There are no proven techniques, and it is just being tested on experimental basis.

The major water security challenges include the deterioration of water quality, and the inadequate storage facilities. In addition, the population factor is putting pressure on water resources, along with interprovincial water sharing conflicts, with an inequity in water distribution. There is low productivity in agricultural sector and the water is not used optimally. There is a need to increase & rehabilitate the existing water infrastructure, and we should go for the non-controversial and low hanging fruits first (dams, reservoirs etc.) Line irrigation should be done in saline water areas. Interprovincial trust should be established. Optimal operational plans should be implemented in case of reservoirs and canals and therefore it needs to be fine-tuned with the demand. In addition, investment and regulations are required to conserve water. Augmentation is important but saving is cheaper & prompt. Those who pollute water resources must be strictly punished. Institutional reforms should be coupled with service delivery, as parallel systems are working in areas of irrigation. Demand management is crucial as the period from 1998 to 2003 was of drought, but there was success in achieving bumper crop. Reallocation within provinces has to take place with the ambit of 1991 WAA, and price of water needs to be rationalized. Cooperation and inland river storage needs to be promoted.

Speaker 2:

Dr. Muhammad Munir Ahmad, Director, Climate Energy and Water Resources Institute, National Agricultural Research Center, (NARC)

Dr. Muhammad Munir Ahmad addressed the audience on the topic of “**Water Smart Irrigation Technologies to Manage Water Scarcity**”. His speech comprised of the following remarks:

Our national Water Policy includes the reduction of 33 percent in the 46 MAF river flows that are lost in conveyance, through:

- Accelerated program of water course lining specially in saline or semi saline areas.
- Increase of at least 30 percent in the efficiency of water use by producing “more crop per drop”.



This will require use of new technologies like drip and sprinkler irrigation and more realistic water pricing policy. The present average rate of water charges per acre is only one fourth of what the farmer pays for tube well water in the ground water market. The presentation consists of suggesting ways and means to produce more crop per drop on farm level using water efficient technologies.

Major constraints for food security are

- Water availability and under-utilization of available water
- Conventional Energy Scarcity (On farm level, the country is facing energy crisis which needs to be mitigated)
- Less command area development of mini/small dams. We have to integrate water pumping and high efficiency irrigation system in those areas to yield high value crop and increased productivity.

- Low efficient and environment friendly irrigation systems and threat of Climate Change and Variability Impacts. There is 0.6 to 1.0 °C increase in temperature and 10 – 15% decrease in rainfall in coastal/ arid area. So related to climate change, there is rise in mean Temperature 0.6 to 1.0 °C and 10 – 15% decrease in rainfall in coastal/ arid area. In addition we have 0.5 to 0.7% increase in solar radiation over southern half of the country. However, we can harvest this solar energy through solar energy on farm level. Hence, the climate has certain challenges as well as potential for us and we have to manage our resources. Now a days it is one of the good options that integrate approach is coming and we can use solar energy for different aspects.

Agriculture makes a major contribution to food security and uses more than 90 % of the water in Pakistan. More than 80 % of agricultural pumps use diesel based system which are less efficient and environment friendly and high cost. The main challenge is to fix our water policies so that less water yields more crop productivity. Hence, a great challenge for the coming decades will therefore be the task of increasing food production with less water, particularly in Pakistan.

As our major irrigation systems are related to surface irrigations. Potentially we can increase our efficiency within surface irrigation in conjunction with cutting edge technology. Our import bill is considerably high and apart from pulses we import potatoes as well. Hence, we should improve our crop per drop to lessen the import bill. In this way we may be able to export our items and manage agriculture in an efficient way.

Now, comparing ourselves in productivity to our neighboring countries, we note that Pakistan is producing half gram per cubic meter and while India is getting one cubic meter of water for one kilogram of yield. Hence, Pakistan is lagging behind.

Crops	Production	Demand	Surplus/Deficits
Wheat	25.75	25.1	0.65 (4 MT carry over stock)
Rice	6.85	3.0	3.85 (2 MT export)
Maize	6.13	5.0	1.13
Sugarcane	5.6	5.1	0.5
Potato	3.8	3.5	0.3
Pulses	0.63	0.89	-0.26
Edible Oil	0.462	2.772	-2.310
Citrus	2.34	1.92	0.42
Mango	1.78	1.6	0.18

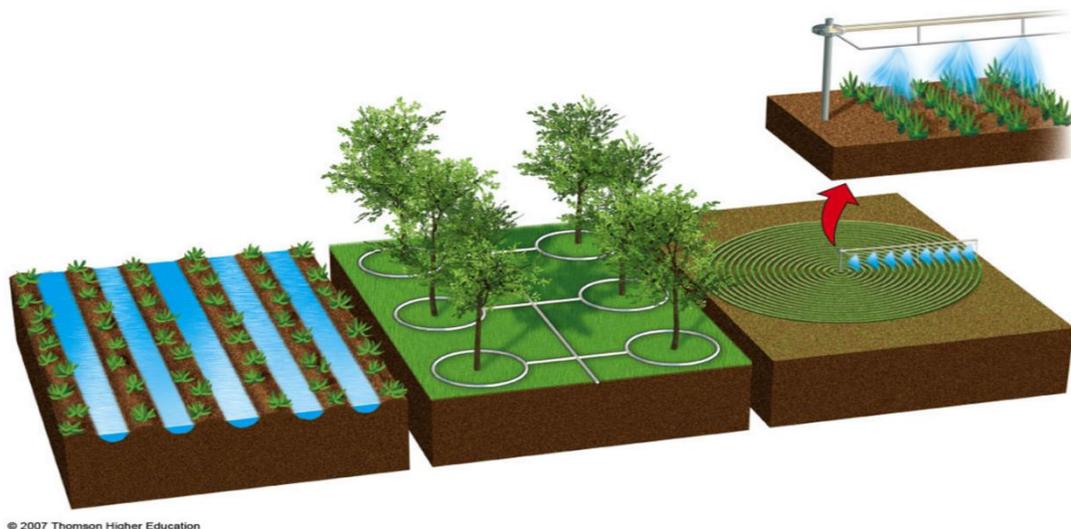
Crop Production in Pakistan (2016-17)

If we apply water conveyance piping, with the new irrigation technologies, we would surely go for irrigation on alternate days or even at night. Now, through these technologies we can supply nutrient with water to only the roots. But, it is worth remembering that energy is required no matter if we use drip technology or sprinkler now-a-days low operational technologies are in the market and must be utilized to decrease the energy costs and enhance the availability. The important factor is that within the acre, uniformity is very good considering drips and sprinklers.

Liquid fertilizers are also available, in which fertilizers and water are combine in a solution form known as ‘fertigation’. The efficiency of gravity flow is 60% and laser level has made the efficiency more suitable. The efficiency of drip irrigation is 90-95 percent. Sprinkler irrigation system’s efficiency is 80-95 percent.

For this reason in Punjab and in Sindh, World Bank has partnered with us and we have applied this technology on 1000 acre with promising results. If we compare it to the world we are still at the introduction phase to adopt these technologies. So in Pakistan we are at the introductory stage as we have covered only 30,000 acre in last year data until June. In this

year, an increase in the cultivable area with new irrigation technologies is forecasted at 100,000.



Simulated Picture of New Technologies for Irrigation

In Punjab, there are other technologies like portable, semi-portable and rain sprinkler system at different locations. There are certain models which can irrigate one area in one second can be moved around. So those can be portable or semi portable system. The drip irrigation system is a good option for fruits and vegetables. Piloting is being applied for rice crops. Other drip systems are 2 to 8 liter per hour as for vegetables we go for 2 liter and for fruit plants we can go for 8 liter per hour. In the deserted areas these systems are piloted that we have to up skill under drip irrigation and the water application efficiency is 90 to 93%. Now the important thing is that if we go for mini dams and command area developments where water is for high value crops

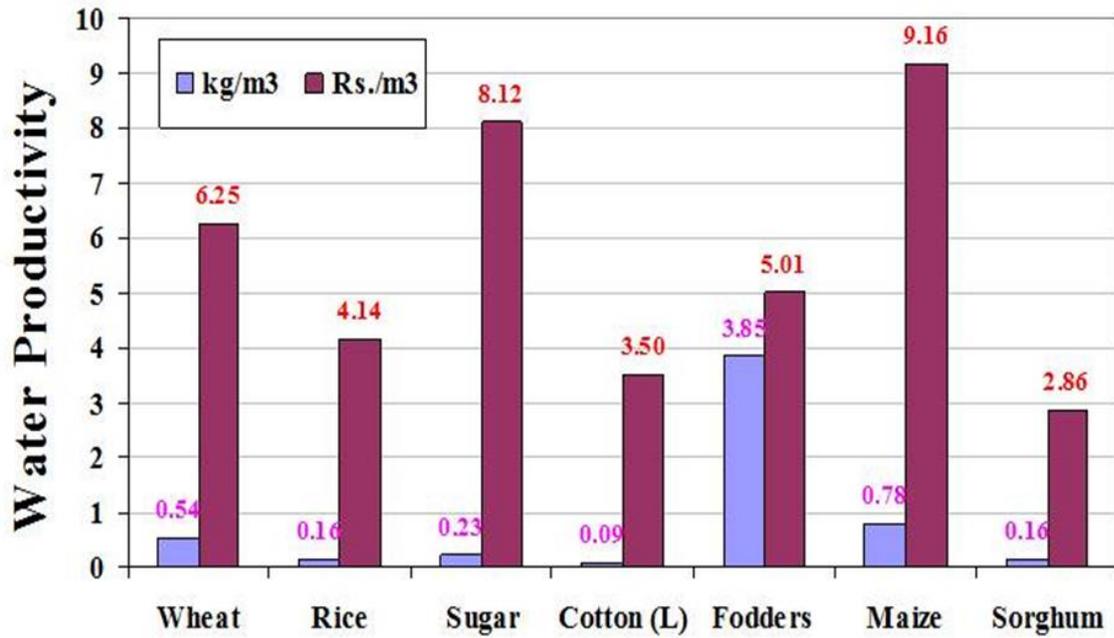
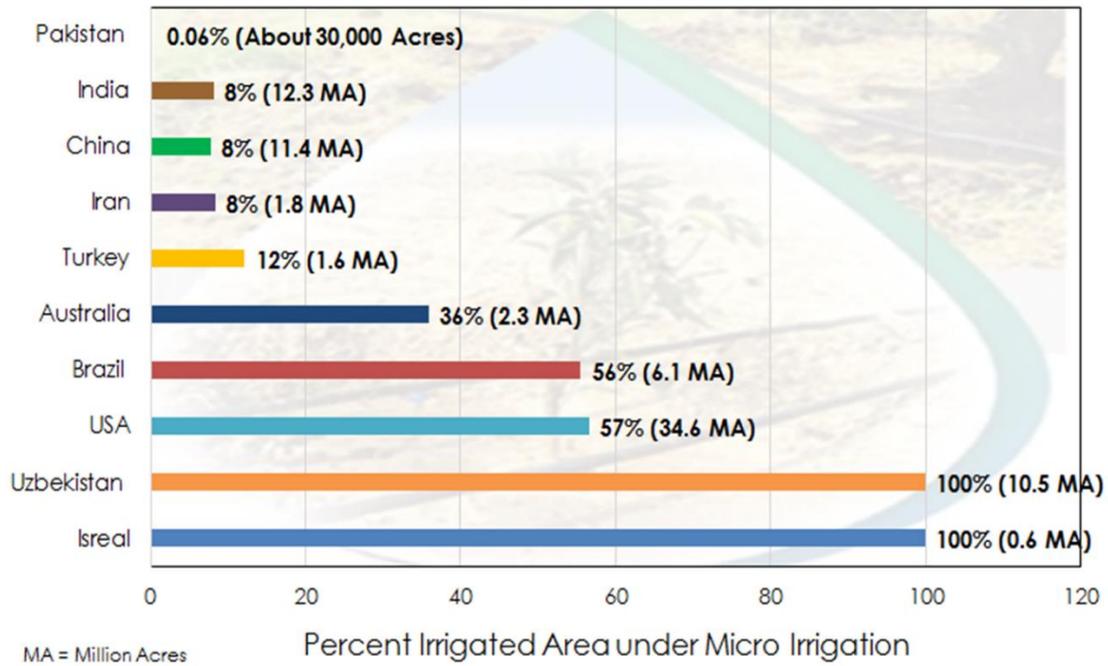


Chart of Low Crop to Water Productivity



High Efficiency Irrigation Systems: A World Overview

The following few measures can be adapted in the light of the above mentioned issues. These are:

- Efficient and judicious use of the irrigation water is the only sustainable option left with us. A transition is required from expensive surface water irrigation into high efficient irrigation systems such as High efficiency irrigation systems (HEIS) such as Drip, sprinkler etc.
- Incentive for local manufacturing and production of HEIS to reduce huge import bill
- New irrigation systems are high-tech, hence, bring private sector service provider is imperative. More jobs for graduates and improving service delivery is the need of the hour.
- From subsidy to incentivizing the farmers is the way to go. Incentive not only to farmers but to manufactures and service providers is also needed.
- Technical services/skill development of farmers in water, energy and irrigation technologies can increase awareness and facilitation for the farming communities.
- Piloting of integrated irrigation technologies and solar pumping farm for high value crops in each village can be initiated.
- Mass awareness campaign of water and energy saving must be started on a countrywide level.

Speaker 3:

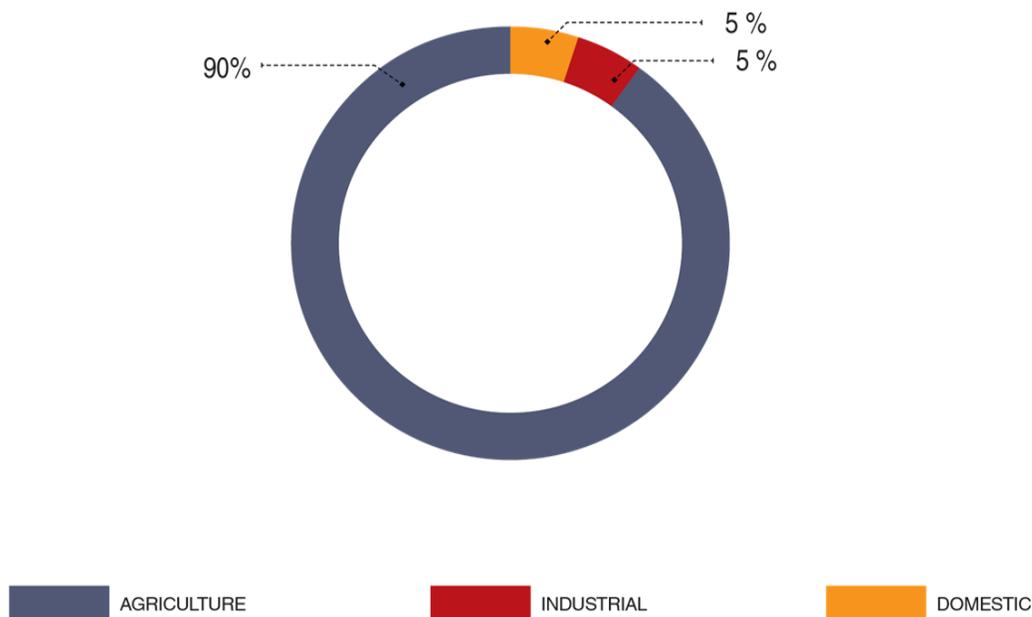
Waseem Anwer Baig, Management Consultant / COO, Baigmann Water Company, Lahore



Mr. Waseem Anwer Baig talked about conservation and need to know how much water we need and how much we have. He stated that: our water comes from glaciers, rivers, lakes, canals, the sea, rain water and underground water. Much is made of the Indus Water treaty, but we need to revise it since it does not meet our needs anymore. He added that why are we not making

dams, when there is hardly any opposition to them, so we should make them. Also domestic water usage is not that important since it does not consume much water. We need to build canal networks, and take advantage of our many rivers. The biggest consumer of water is our agriculture sector. It uses 90 percent of our water supply.

WATER - CONSUMPTION PATTERN IN PAKISTAN



We need to stop worrying about India, and instead focus on the agricultural sector. Our biggest source of water loss is the agricultural sector. The industrial sector produces so much with 5 percent of the water. We need to run on two programs:

- One on national level
- One on regional level

On national level, we need dams to deal with floods. We need to educate the masses on saving water in agriculture, and industry. We can shift industry to sea shore. We need to impose heavy taxes on agricultural income. Agriculture is tax exempted right now. We should especially tax sugarcane producers who consume so much water. The media needs to expose this. Our water producers are producing mineral rich acidic water. We should test our water content and ensure that it has less mineral content and is not acidic.

Speaker 4:

Dr. Muhammad Ashraf, Director General, Pakistan Council of Research in Water Resources



Dr. Muhammad Ashraf enlightened the participants on the topic “**Groundwater Potential in Indus Plains**”. His speech includes the following remarks:

Water scarcity is considered to be a myth it is not as it has become a reality. In 2016, Pakistan Academy of Sciences conducted a workshop on Water scarcity in which I mentioned the four indicators in my paper and the data was used to describe the water scarcity in any country in any region, those are:

- Fault marked indicators
- Water poverty index
- Image water scarcity and Physical and financial water scarcity
- Water viability index

Taking into account those indicators, if those situations continue, the population growing as such and the water resources remain stagnant. By 2025, Pakistan will be touching the absolute water scarcity line. Before it was a myth that Pakistan will become dry by 2025 without realizing that we are going to deal with water scarcity. After 70 years, the national policy was approved and the Supreme Court becomes active as well as our government. As it has become a reality, we are now going to talk about ground water resources, its challenges in management, its issues we are going to face in future and the way forward to it. I would like to start off with a quote by Benjamin Franklin

“When the well is dry, we know the worth of water.”

A well can be dried up because of two reasons:

- Depth of water in the well. How much water can be pumped economically and sustainably?

- Quality of water in the well. What should be the quality of the water in the well so that it could be used for domestic or agricultural purpose?

Groundwater in Pakistan

We are fortunate that we have one of the largest groundwater resources of the world (4th after India, USA and China). Its supplement over the Supplement over 60% of the surface water supplies where more than 90% of drinking water comes from the ground water and almost 100% industrial water comes from the groundwater. It also helped increase cropping intensity from 63% (1947) to 150% (2016) so this is the potential of this ground water resource which is basically a hidden resource and a least concern by the users.

Groundwater Issues/Challenges Groundwater Issues/Challenges

The ground water is basically saline because of its marine geological position. It was said ages ago that Indus water basin was the part of the Arabian Sea gradually sea retreated and the recharge of the freshwater from the heavy irrigation water network. A thin freshwater layer exists over this saline formation as a result of seepage from the rivers and the irrigation systems.



No groundwater regulatory framework. Anyone can install any number of wells of any capacity, at any depth and can pump any amount of water at any time. In 1960, the number of tube wells in Pakistan was about 20,000 which have

now increased to over one million. This practice has led to the groundwater depletion,

both quantitatively and qualitatively. It has been reported that out of 43 canal commands, the water table was declining in 26 canal commands due to rapid increase in groundwater abstraction. Similar is the situation in large cities where water table is depleting at an alarming rate. In Baluchistan, the groundwater is depleting in many basins particularly in the Pishin-Lora and Nari basins and drying up of the centuries old karez irrigation system. So, this the major issue as we do not have regulatory framework and now supreme court has taken action against different departments who are pumping illegal water from the ground and selling it and because of that number of water is depleting in almost all urban settlement. As we have no proper way of consuming rain water the shift towards fossil water has turned.

Groundwater Investigation and Mapping

As mentioned before that we need a proper design and installation of tube well, we need a developing strategy for how much amount of water you can pump from a particular based on the ground water aquifer and also on the bases of recharge available so the investigation and mapping of water is really needed. It has been a neglected subject in Pakistan and no institution has properly focused on it. A few studies were conducted by individuals or some institutions such as International Water Management Institute (IWMI) on a limited scale. In 2003, Pakistan Council of Research in Water Resources (PCRWR) started mapping the groundwater in the Upper Indus basin (four doab basically) with the financial support of the Government of Pakistan through Ministry of Science and Technology. Up to 0-50 meter the green area is basically fresh and the red area is saline as we go deeper the ground water becomes more saline and saline. The only fresh water is available in Indus water pockets.

Zone	Thal Doab	Chaj Doab	Rechna Doab	Bari Doab
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Upper	8.0	9.0	7.0	4.5
Central	9.0	9.0	8.0	4.5
Lower	10.0	8.0	8.0	4.5
Average	9.0	8.7	7.7	4.5
Average for Upper Indus Plain Aquifer			7.5 BCM per Mha	
Total Average Annual Recharge in UIPA			80.3 BCM	

The safe yield is calculated for the upper Indus plain
(The potential is about 60 million)

Groundwater Quality Problems

We have conducted series of studies as in 2002 we conducted national water quality monitoring program and we came to know that out of all cities the provided safe drinking water is about 30% sample for contaminated water. Industrial and municipal effluents are the major sources of groundwater contamination. The contamination of freshwater is due to lateral and horizontal movement of saline water, drainage effluents and disposal of saline water into canals/rivers. Solid municipal waste sites in all the cities are the permanent source of organic and biological pollution. The studies conducted by PCRWR found four major contaminants in the groundwater which also the main source of drinking water in the country. These contaminants are: micro biological (fecal coliform), arsenic, nitrate and fluoride. As from 2004, you can see that 70 to 80% samples in all 24 countries were provided almost contaminated water which is drinkable and from rural areas we can see that out of 40,000 collected samples only 18% were safe where 72% were unsafe.

Major Contaminants

1. Wide spread Bacterial Contamination (All over the country)
2. Arsenic Contamination (Punjab & Sindh)
3. Fluoride & Nitrate Contamination (Balochistan, KP & Punjab)

Sustainable Groundwater Management (SGWM)

The sustainable groundwater need abstraction and recharge as whenever there is imbalance in the recharge which leads to more logging and salinity and if the abstraction is more than the depletion. The quality of water and those are the techniques which were practiced in Baluchistan as well. Firstly, we have to increase the source base in which Rainwater harvesting: small, medium dams, ponds, micro catchments, and rooftop). To manage the available Water Resources improving the conveyance efficiency in the watercourse lining/improvement is needed. Using high efficiency irrigation systems to Chang the existing cropping pattern and introduce less water requiring crops/plants and controlling installation of tube wells to in-active the recharging zones of Karezes. In order to use of the non-conventional water resources; saline water wastewater etc. and adopting proper irrigation scheduling. The third factor is of Develop groundwater regulatory framework, Educate the people and Mass awareness campaign for water development, conservation and management. The national water policy has focused upon the aspects that they should focus on the atlas of groundwater development.

Groundwater Recharge

Any type of structure, device, technique, measure, plantation that acts as a barrier to reduce the runoff velocity and retains the water for specific time, enhances the rainwater movement towards aquifer and the rainwater is conserved below the ground surface as well as eliminates the evaporation losses.

Delay Action Dam – A Conventional Groundwater Recharge Technique

To recharge the occurrence from the dam reservoir (upstream of the dam) we need Heavy sedimentation in the reservoir and after few years' acts as evaporation pond without contributing to the aquifer. High construction cost and heavy machinery involved; limited sites and no watershed management activities in the catchment.

Leaky Dam – An Innovative Groundwater Recharge Technique

Water is released to the downstream at the rate it is infiltrated into the soil

1. Sediment is retained at the upstream
2. Recharge occurs at the downstream of the dam
3. Provides more surface area for groundwater recharge
4. No ponding of water for longer time – minimum evaporation
5. Easy availability of sites and material
6. Easy to construct, cascade approach
7. Low cost

Conclusion

As Dr. Zakir mentioned that groundwater is not such a resource as we are decreasing the vegetative cover. We are increasing the urbanization and increasing the mattered area which is the recharge to the aquifer has stopped and there had been a gate emphasis on water conservation and its importance in the Quran, the word water is mentioned 500 times in Quran and 63 versus exclusively talk on water.

Water is not an finite source, it is infinite source that Allah has sent in due measures and we can use it for our productive measure otherwise we will be out of the system “And We send down water from the sky according to (due) measure, and We cause it to soak in the soil; and We certainly are able to drain it off (with easy). With it We grow for you gardens

of date-palms and vines: in them have ye abundant fruits: and of them Ye eat (and have enjoyment)” ladies and gentlemen, on this, we have to manage our ground water resources and it can only be managed by recharging the aquifer and reducing the abstraction and the most important factor is that recharge the vegetation and herein is the importance take place is plantation.

Speaker 5:

Mr. Shams ul Mulk, Former Chairman, Water and Power Development Authority (WAPDA)



Mr. Shams-ul-Mulk expressed his gratitude to Center for Global and Strategic Studies (CGSS) for organizing such an excellent event and said that this event will contribute towards the discourse on water security, related issues and way forward on how to deal with water aggression as well as its conservation. He addressed the audience on the topic **“Futurist Profiling of River Indus with Special Emphasis on Water Flowing from Western Borders”**. His speech included the following remarks;

I have spoken a lot about water, reservoirs, and irrigation systems. However, I have come to the unfortunate conclusion that there is nothing wrong with what we have but something is wrong with us. We act as absentee landlords of the gift, which Allah has given us. Here “absent landlord” means that somebody having a lot of land but he lives in far off areas and he comes once a year and passes through certain area and says that this land is supposed to my land and the other person says yes, it was. Since you’ve been not bothering about it so, someone else has come and took over that land. One thing is noticeable, if we want to reduce our guilt that Indus Water Treaty was wrong, it protects my share of water in the western rivers, all the time and it is also flowing through the Indian occupied Kashmir. The moment it enters Pakistan, we let it go on into the sea which is the typical behavior of an Absented land lord.

It is not that our people did not know about it, what we should be doing? In fact, we are very fortunate that after the independence of Pakistan, we were led by giants not by ordinary managers. Like Ghulam Ishaq Khan, Ghulam Farooq Khattak, H.M Kazi and other people of that stature, were well-wishers of WAPDA as an organization. In old times, very senior member of the WAPDA was of the view that the most important manager developer of east of Suez is chairman WAPDA. On another moment, Secretary energy of United States of America happens to come to a visit to Pakistan where a meeting was held and there was a question by secretary that how much does it cost to generate electricity per unit (at that time of year Pakistan power capacity was predominantly by hydel). When he was answered with an astoundingly low price 0.10 paisa per unit, he exclaimed with surprise, isn't that very cheap! Former Chairman of WAPDA answered that Yes, it is cheap because that the whole process of generating electricity, the maximum cost is the fuel and hydel does not require fuel. If Pakistan has followed that route, it would have been with China in terms of 'Industrial production' and the cost of production. This is what it should be but Pakistan lacks with the capability to talk about the route. India knew this all the time and did all in its power to thwart Pakistan from treading on that route. Unfortunately, India had many sympathizers in Pakistan that did not let it happen. Recently, the Chief Justice of Pakistan instructed that if anyone opposes dam, the constitutional provision of treason should be evoked against them. This is commendable and the edict must be followed in letter and spirit.



After the independence of Pakistan, we started world's largest project to replace three rivers, which were tributaries of famous and the mighty river Indus. In view of the rapid growth, Pakistan was well on its way to become the Asian tiger. Because of Pakistan's potential, India's agents in Pakistan were concerned about the Kala Bagh dam. Pakistan has been blessed with potential of Kala Bagh dam which we didn't know and this dam would have given us much cheaper electricity. The fault lies with the past rulers who had a chance to manage the existing resources.

When World Bank came for a draft of Indus water treaty, it was conveyed to the former Prime Minister that if "Pakistan can win a war against India regarding the possession of water rights, then signing a treaty would be a false decision, but if Pakistan couldn't go for that option owing to capacity issues, then this is the best deal to be signed". Tarbela and Mangla still gives Pakistan two rupees per unit electricity compared to 15-25 rupees from independent power producers. The generation of 25 rupee per unit electricity in Pakistan is criminal as Pakistan has hydel potential of almost about 80,000 megawatt.

The question here is that why have Pakistan started suffering? When Tarbela started silting, WAPDA asked World Bank to prepare post development report. That was the time when Pakistan was growing at 10 percent for some period. World Bank responded with a reply stating that if Pakistan wants to maintain this kind of growth in future, then it must have another reservoir in addition to other recommendations. Kalabagh was already identified as a potential site for reservoir construction. There was another recommendation of a reservoir, which had to be built by 2010. This was Bhasha dam which is still not constructed in addition to Kalabagh. That is the reason why we are deficient of water. The conditions have been aggravated by climate change as well. The need to make a dam should be core concern, not choosing a dam but to build both of them. The initiative of Chief Justice and Prime Minister of Pakistan to construct Bhasha and Mohmand Dam is worth applauding and without it Pakistan could never prosper.

“Fierce national competition over water resources has promoted fears that water issue contains the seed of violent conflict....But the water problems of our world need not be only a cause of tension; they can also be a catalyst for cooperation.... If all the world’s people work together, a secure and sustainable water future will be ours”.

(Kofi Annan, World Water Day 2002)

Conference Followed by Roundtable Session

In continuation to this Conference, CGSS organized a Roundtable Session on the aforementioned topic in which all the major stakeholders and water experts participated and provided with their valuable input for suggestive policy recommendations.

Roundtable Session Report

“Water Security: Issues/Way Forward on Aggression and Conservation”



Organized by

Center for Global & Strategic Studies, Islamabad

at Islamabad Club

On 13th November, 2018

Participants

The Roundtable was attended by renowned water experts, scholars, practitioners and members of the Center for Global and Strategic Studies Advisory Board. The list of speakers who participated in the event were:

Host: Major General Syed Khalid Amir Jaffery, HI (M), (Retd), President – Center for Global & Strategic Studies (CGSS)

Moderator: Brigadier Muhammad Aslam Khan, (Retd), Member Advisory Board – Center for Global & Strategic Studies (CGSS)

Speakers:

1. H.E. Sherali S. Jononov – Ambassador of the Republic of Tajikistan
2. Lieutenant General Asad Durrani, HI (M), (Retd) – Member Advisory Board CGSS
3. Lieutenant General Naeem Khalid Lodhi, HI (M), (Retd) – Former Defense Minister, Government of Pakistan
4. IG Kamal ud Din Tipu, (Retd) – Member Advisory Board CGSS
5. Major General Muhammad Saeed Aleem, (Retd)
6. Mr. Ashfaq Ahmed Gondal – Senior Member Advisory Board CGSS
7. Commander Naeem Sarfaraz, (Retd) – Member Advisory Board CGSS
8. Mr. Abdullah Hamid Gull – Member Advisory Board CGSS
9. Dr. Muhammad Ashraf – Director General Pakistan Council of Research in Water Resources (PCRWR)
10. Dr. Zamir Ahmed Awan – Deputy Director Chinese Study Center, National University of Science and Technology (NUST), Islamabad
11. Dr. Hassan Abbas – Chairman ZIZAK (Integrated Water Resource Management)
12. Dr. Basharat Hassan Bashir – Member Advisory Board CGSS
13. Mr. Sikandar Hameed Lodhi – Member Advisory Board CGSS
14. Professor Masood Malik – Member Advisory Board CGSS
15. Professor Dr. Muhammad Khan – International Islamic University

16. Ms. Agnes Pompos – (Hungary) International Water Expert On Peaceful Water Sharing
17. Mr. Nawaz Ali – Member Advisory Board CGSS
18. Mr. Makhdoom Babar – Editor in Chief Daily Times and Member Advisory Board CGSS
19. Brigadier Tahir – Editor in Chief Hilal Magazine, ISPR
20. Mr. Kanwar Dilshad – Member Advisory Board CGSS
21. Mr. Tassadaq Raja – Member Advisory Board CGSS
22. Mr. Khalid Rahim – Member Advisory Board CGSS
23. Mr. Maaz Awan – Tianjin University
24. Ms. Saba Abid – Research Scholar, National Defence University
25. Mr. Zahid Latif Khan – Former President Rawalpindi Chamber of Commerce & Industry
26. Mr. Maaz – President All Pakistan Business Forum
27. Mr. Raza Ansari – National Defense University, Islamabad
28. Dr. Murtaza Mughal – Pakistan Economy Welfare
29. Mr. Chingiz Garibli – Deputy Head of Mission, Embassy of Azerbaijan, Islamabad
30. Mr. Dorkhan Nursoaynov – Representative Embassy of Kazakhstan, Islamabad
31. Mr. Azaf Saflyhuliyar – Representative Embassy of Turkmenistan, Islamabad
32. Mr. Aibek Tileboliev – Representative Embassy of Turkmenistan, Islamabad

Brief of the Event

Center for Global and Strategic Studies, Islamabad organized a Roundtable Discussion Session on “Water Security: Issues/Way Forward on Aggression and Conservation”, on 13th November, 2018 at the Islamabad Club, Islamabad as a follow up to the conference on the above-mentioned subject.

The water security experts shared their ideas on the imminent water crisis in Pakistan and provided their valuable insight for the mitigation of ongoing water issues with suggestive recommendations to overcome the pertaining challenges to further devise a policy framework.

The speakers of the roundtable stated that the country has a potential to make small to medium size dams. Small dams could be built by private sector and the investors should be incentivized.

Furthermore, the experts suggested that, rain water harvesting must be introduced at the household level both in urban and rural areas. Flood irrigation is a criminal act that is still being practiced in Pakistan. Navigation industry and water parks are promising and can alleviate flooding.



Therefore, it is the right time to enhance the capacity building at all the levels for instance, awareness campaigns particularly at educational institutions, political campaigns, seminars and through media campaigns. The roundtable discussion was attended by more than 60 experts from all over the Pakistan.

Opening Remarks

Major General Syed Khalid Amir Jaffery, HI (M), (Retd) – President Center for Global and Strategic Studies, Islamabad

Major General Syed Khalid Amir Jaffery, HI (M), (Retd) – President Center for Global and Strategic Studies extended a warm welcome to the esteemed guests for their participation in the event titled “Water Security: Issues / Way forward on Aggression and Conservation”. In his introductory remarks he said:



It is my proud privilege to welcome you all on behalf of Center for Global and Strategic Studies (CGSS). My special thanks to the worthy speakers, excellences, academicians and experts who would talk on this important subject of “Water Security”. I hope that today’s session would be an informative session for all of us.

Ladies and Gentlemen,

With the ever-increasing demand for water globally, experts believe that water insecurity will become a cause of future wars. In fact, the demand for fresh water has already become a major issue for policy makers all around the world. According to the United Nations water security is “The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development for ensuring protection against water-borne pollution and

water-related disasters, and for preserving ecosystems in a climate of peace and political stability”.

Pakistan’s water profile is drastically changing from being a water abundant country to a water-scarce country due to depletion of its fresh water resources because of increasing population, adverse climate variations like drought and inconsistent monsoon patterns and the lack of storage facilities as it has constructed no water storage reservoir on the Indus since the Tarbela dam was built in 1976. The Per capita water availability during the period from 1990 to 2015 fell from 2,172 to 1,306 cubic meters per inhabitant. Pakistan extracts almost 75 percent of its freshwater annually, which is exerting tremendous pressure on renewable water resources. There is a need for adequate management of water supplies within the borders to start working on the stalled water storage projects like the Diamer – Bhasha, Dasu and Bunji dams, which would not only cater the water needs but also improves the energy generation capacity.

In recent years, Pakistan has suffered from severe water shortages, flooding and declining water quality. The worsening water crisis must be resolved if the country is ever to achieve stability and sustainable development.



Using water more efficiently is a necessity but insufficient strategy which requires in depth strategic framework and policy for instance, cultural and social paradigm shifts that will help the country evolve from a feudal society to a modern one and a blueprint for managing the water crisis that includes controlled population growth, educational

reforms with stress upon water usage, wastage and public awareness campaigns, adopting modern water techniques in agricultural sector and normalizing relations with neighbors specifically with India.

Addressing the issues of demand and supply of water, there were several attempts at the federal and provincial level which explains the national commitment to combating water issues. The national climate change policy, lists appropriate action plans for enhancing water storage and infrastructure. However, it only emphasizes on better water-resource management, enhancing institutional capacities and creating awareness about water issues but in the wake of present scenario, additional steps are needed in terms of implementation because Pakistan has not implemented any major water storage infrastructure projects since the commissioning of the last constructed dams in the 1960s and 1970s.

A more holistic national water policy is the need of the hour which should not be restricted to only policy level such as, the national climate change policy and national drinking water policy but it should be multidimensional in terms of an integrated water management system which promises efficient water distribution at all levels and must be entrenched and supported by an effective institutional and legal system.



If we do not take effective timely steps then the results will worsen with drastic effects of floods and severe droughts. Changes in water availability will also impact health and food security and have already proven to trigger non-security

challenges such as, refugee dynamics, political instability, and economic growth and as well as decrease in the national developmental progress.

Roundtable Discussion

The session started by highlighting the agenda of ‘Water Security: Issues/Way forward on Aggression and Conservation’ and focused on the importance of water preservation, water wastage, water utilization and development of water resources for agricultural, industrial and domestic purposes by initiating more realistic steps and stressed upon the importance to guide the general public. The conference was sub divided into two themes: Water Aggression and Water Conservation with an aim that the connotation of dialogue should be factual and should beyond the past scenarios to come up with concrete solutions and to educate the younger generation towards the importance of healthy environment.

Water Aggression

In the account of water aggression the speakers gave the historical background by highlighted the fact to understand the environment in which the Indus Water Treaty was concluded and should not be made controversial because in those



circumstances that was the best treaty, yet there are a few flaws in the treaty which can be overcome by seeking help from the international community to find the best possible

solutions. Back in 1951, the articles of David E. Lilienthal clearly mentioned that this treaty was not best for Pakistan and if at that time Pakistan had taken the case in the International Court of Justice (ICJ) then it would have resulted in Pakistan's favor.

The Indian water aggression started in the year 1948 when, the actual irrigated areas for Pakistan accounted for less than 10 percent and in order to save that Pakistan lost three rivers. The statements of Indian Prime Minister Narendra Modi "Blood and water cannot flow together simultaneously" and "Water that belongs to India cannot be allowed to go to Pakistan", clearly show the current Indian aggression towards Pakistan.

There are provisions in the Indus Water Treaty (IWT) for building dams and sharing information which was not done in accordance to the treaty. Despite this, economic growth can be achieved by pointing the attention of our water management policy towards the utilization of the rivers in navigation with cargo boats, cargo barrages from the Indus Delta all the way into Kabul and Jalalabad and to industrial cities. By fixing the irrigation leaks, riverine corridors and most importantly towards capacity building which can be planned and implemented in following three levels;

- i. Interstate level
- ii. Policy Making Level
- iii. Arbitration

The best possible way to contest the aggression is the forums of water experts and through effective diplomatic means. It is well known that Pakistan is rich in technical experts who are aware, if the legal and diplomatic intricacies of the



issue at hand, but Pakistan lacks adequate research bodies which facilitate the quality research, which could put forward recommendations for formulating a sustainable policy for implementation. The direction of the policy should be stressed upon the proper use of domestic and industrial water before they actually discharge into the sea.

Water Conservation

Water conservation is a broader concept includes all policies, strategies and activities to sustainably manage the natural resources of fresh water to protect the hydrosphere and to meet the current and future human demand. As far as preservation is concerned the speakers stressed that Pakistan is lacking in the account of implementation. Pakistan is good at going towards 2nd stage and convert into many good plans but this verdict is not enough, all we need is to implement in a sustainable way.

In the current scenario there is an obsession of making big dams. Pakistan has agriculture based economy. This sector employs more than 60 percent of population, and more than 80 percent of the water is used in the process. Due to the underdevelopment and the lack of maintenance of the irrigation systems, defective canals, and leaking pipes and the misuse of water results in loss of 50 percent of the water. An expert opined therefore, that Pakistan has to set the focus on planning and



building small reservoirs which can be used to preserve water during the rainy season, which can be utilized in the dry season. At the moment, due to the limited water storage capacity and infrastructural deficits, the Indus Basin can barely store 30 days of water, compared to India's major rivers, which store about 120 days of supply.

In addition to this, Pakistani policymakers have to emphasize on educating its public and youth that the water stress is going to increase more due to growing demand due to rapidly expanding population as well as simultaneous urbanization, industrialization and adverse impact on environment challenged by climate change will continue to effect the degradation of water quality and understanding between the conservation and preservation.

In Pakistan the climatic conditions are rapidly changing; wet season is becoming wetter and dry season is becoming drier. The crop zoning and crop pattern plan needs to be established on immediate basis for instance, in Australia grain crops are not cultivated on irrigational water, and is used only for cash crops. Therefore, we should look upon building small reservoirs, which will benefit the present and the upcoming generations in the future, we must stop looking at the past, it is the time to look forward, as a saying that “those who look back, are frozen”.



Suggestive Recommendations

- i. A holistic framework of national water policy should be developed, which establishes the basic right to access to water for all segments of society in every province, cements the principle of sustainable water utilization, enforces the active maintenance of existing water related infrastructure, creates a framework for the governance of water management related institutions, scientific and other research centers and provides for an efficient dissemination of information and implementation of the policies.
- ii. Water, due to its nature requires a holistic, participatory and coordinated approach that considers the effects on the economy, social wellbeing and the environment. Water related policies should be drawn up in consultation with political, technical and social stakeholders as the implementation will affect every element of society. Best practices from around the world shall be studied in order to create the most efficient, sustainable policies.
- iii. The increasing scarcity of water stems from increasing water demand. In order to avoid and root out the uncontrolled abstraction of ground water reserves, domestic water pumps should be abolished and the government should provide access to piped water to all segments of society. This will ensure not only access for everyone, but also the accurate monitoring of utilization. The pipe system connecting both domestic, as well as industrial and agricultural users shall be fitted with accurate meters, water tariffs shall be set in accordance with the scarcity of water in order to curb irresponsible over usage and reasonably increased water pricing will recover sufficient funds to enable consistent investment in water infrastructure.
- iv. The government is encouraged to create schemes for the agriculture sector to promote the implementation of sustainable, equitable and responsible water usage through the utilization of best practices. A special emphasis should be given to

highly effective irrigation systems. The government shall facilitate the implementation of the latest technologies and the dissemination of up to date knowledge in order to ensure sustainable growth of yield while implementing environment friendly practices.

- v. Agricultural activities should be organized in zones which divide land based on their hydrological properties. This land and water management method aims to protect local water sources from risks of over-abstraction, land salinization, groundwater pollution and waterlogging by managing land use activities based on the assigned hydrological zones. This practice would ensure that crops with high water requirements should not be planted in arid areas or in areas where the water levels are not adequate, therefore curbing irrigation.
- vi. Housing societies shall be obligated to install rainwater harvesting facilities and mini water treatment plants for every one kanal or larger buildings, in order to facilitate water collection and the re-utilization of domestic water.
- vii. Best practices on water recycling from other region should be examined and implemented in Pakistan. For instance, Israel's practice of treating and re-using almost all of the nation's domestic waste water for irrigation in the agricultural sector; and their highly advanced irrigation methods such as moisture-sensitive automated drip irrigation directly to plant roots could be explored.
- viii. The government shall develop a comprehensive awareness raising and educational campaign to inform people at all levels (starting at elementary school level) of the importance of conserving water and best practices.

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Overview of the Report

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