Draft Recommendations for the Global High Level Panel for Water and Peace

Protecting Water Resources and Infrastructure in Armed Conflicts and against Violent Actions in General

Incentive Financing for Collaborative Water Infrastructure

Preventing Conflicts over Water Quality

New Mechanisms for Hydro-diplomacy

Protecting Water Resources and Infrastructure in Armed Conflict and Against Violent Actions in general

A. Executive Summary

- Water is seldom the single cause of armed conflict but water issues are among the most important contributing factors and water also often becomes a military and strategic tool in conflicts.
- While Water and infrastructure can incur great damage during armed conflict, it is also used as a weapon of war. Such deliberate acts of violence against water or its usage to inflict harm upon civilians is on the rise. The international community must act soon to prevent such acts.
- The world is facing water scarcity which is exacerbated by climate change. The damage caused to water during armed conflict could further worsen the situation.
- Hence a series of measures which are Political, Legal and Technical in nature need to be undertaken in order to afford maximum protection to the scarce resource.
- The protection of water infrastructure is gaining political momentum with President Macky Sall of Senegal urging the international community to afford protection to water resources and related infrastructure. The UNSC Resolution 2286(2016) urging parties to armed conflict to protect medical facilities and personnel could pave the wave for more such actions by international community toward protection of water.
- Parties to the conflict must be encouraged to utilise and fully implement the laws that afford some form of protection water resource and infrastructure protection including the Geneva Conventions and its Protocols. Judicial enforcement for violations of the existing legal provisions must be undertaken. Development of global legal instruments specifically aiming at water resource and infrastructure protection should also be looked into.
- There are several UN bodies, international as well as regional bodies including river basin organizations that could help in the protection of water. In this regard specifically exploring the role of UN peacekeeping forces as well as ICRC would be paramount. The role of Trusteeship Council could also be invoked.
- Engaging with armed non state actors which operate outside the scope of law is needed to ensure complete protection of water resources. Furthermore innovative techniques of engagement with all parties to the conflict as well as terror groups are required and one such method would be focusing on regional and religious laws which do afford protection to water.
- Prevention of attack to water is important. Hence, early warning systems as well as the usage of technological advancements must be encouraged.
- Lastly, an international conference on water, security and peace similar to Congress of Vienna, Paris Peace conference, Bretton Woods and Rio and the like could be useful to draw the attention of the international community towards the issue and take substantial steps.

B. Introduction

On 22nd April 2016, Senegal's President Macky Sall, chairing the Arria formula meeting at the United Nations Security Council called the attention of the international community towards the urgent need to protect water resources and related infrastructure during armed conflict and from acts of terror. Undoubtedly this will generate discussions at the Security Council as well as the General Assembly. The world has already witnessed unprecedented attacks against water resources and infrastructure. The political momentum that is being garnered in support of the issue is due to that fact that the effect of conflict and acts of terror on water resources and infrastructure could be manifold and has an adverse impact on the civilian population.

It is seen that during armed conflicts, water resources or water infrastructure are either deliberately targeted in order to afflict maximum damage to the warring factions, as well as civilians or they tend to become collateral damage.

Conflicts result in wanton damage to the water infrastructure. Due to the hostilities in Somalia, the country's water system, especially in Mogadishu, collapsed. It is said that the civil war that began in the country in 1991, resulted in a complete failure of the water supply system by mid-1995.

Water is also used as a weapon of war. The 16 year civil war in Mozambique which ended in 1992 saw landmines being used deliberately to block access to water to civilians.

During Libya's brief civil war, it is said that two thirds of Tripoli's water sources were shut down by Muammar Gaddafi's forces leaving almost half the country short of water. In 2012, in Afghanistan, wells near a girls' high school was poisoned by insurgent groups as a mean to punish them for receiving education. During the conflict in Darfur a number of wells were poisoned as a campaign to intimidate local residents.

Daesh has been strategically using water as a weapon of war to further its own interests in expanding territorial control, spreading terror, as well as a means to protect them. In January 2016, Daesh captured Syria's largest dam-Taqba, where they were hiding high value prisoners as well as senior officials. In April 2014, Daesh closed a dam in Fallujah, Iraq, which flooded the surrounding regions resulting in the displacement of 12,000 families. This was done to escape airstrikes as they are fully aware that the dam can flood large parts of Iraq and cause a power outage for eastern Syria.

Similarly in Somalia at present, Al-Shabaab is using a changed tactic which includes cutting off water supply to liberated cities so that they can demonstrate their power and presence as well as recover some of the areas lost from the government

The evolution of non-state actors towards attacking critical infrastructure, including water installations, is unlikely to abate and will serve as an example for other groups which is likely to also start using the same.

Water (ground and surface) gets polluted during conflicts which makes it unfit for use by the civilian population for the purpose of drinking and other personal use. The pollution could be microbial or chemical. Shortages of water due to contamination and otherwise could prove to be deadlier than most weapons used in war.

Also, the restoration of functionality of water infrastructure poses a great challenge due to the fact that takes considerable amounts of time, resources and political will of the state as well as the international community.

The destruction of water sources also causes the displacement of civilians, threatens food security, and exacerbates the risk of epidemics and illness.

Furthermore conflicts, whether internal or external, pose several issues when it comes to riparian relations:

- Nations embroiled in armed conflict are unable to maintain the quality of water which will have an effect on other riparian nations as well.
- Since water resources, as mentioned earlier, are also used as weapons of war, ensuring a suitable quantity of water becomes a further problem which will impact other riparian nations.
- Cooperation arrangements are difficult to establish with nations grappling with internal conflicts or full scale war. This is due to a variety of reasons including lack of a legitimate authority to establish such a cooperative mechanism.
- The large scale destruction of water system would mean more resources - financial and otherwise - to be spent on restoring the same. Hence post war, countries would be still reluctant to enter into any arrangement which would not completely satisfy their water requirements.

Climate change and general scarcity of water generates further urgency towards the protection of water resources and infrastructure.

In the past special protection to certain civilian infrastructure which is highly essential has been afforded by the international community. In 2011 the UNSC resolution 1998 was passed which *inter alia* declared schools and hospitals protected from any attacks by state as well as non-state actors. On 3rd May 2016, the UNSC again adopted a Resolution which demanded that all parties in an armed conflict should protect medical facilities and their staff. This resolution even urged nations to bring those actors responsible for such attacks to justice reminding the international community that such acts were regarded as war crimes under international humanitarian law. The United Nations Environment Assembly (UNEA) adopted a resolution in May 2016 on the 'protection of environment in areas affected by armed conflict'. These resolutions can serve as a precedent for the international community to bestow special protection to water and related infrastructure. In terms of ensuring state commitments, Sustainable Development Goal No. 16 which talks about 'peaceful and inclusive societies for sustainable development and significantly reduce all forms of violence and related death rates everywhere' needs to be brought to the forefront. This could be used to encourage states to take all measures for the protection of water resources and infrastructure.

C. The Problems with the Classification of Threats to Water Resources and Infrastructure

When the protection of water resources and infrastructure is considered, there has to be close attention paid to the determination of whether there is internal or external armed conflict. This

determination is necessary mainly because, the measures taken for protection are contingent upon such determination. If for example, a country faces a war or non-international armed conflict, then the laws of war along with a plethora of other measures would be applicable. However, if it is merely classified as internal disturbance or even terrorists attacks, the rules would differ.

The complication arises when such a determination cannot be made. It is common practice for a state to deny that a non-international armed conflict (NIAC) exists on its territory. This makes it difficult to determine the exact point in time when armed conflict came into existence for the Law of Armed Conflict (LOAC) to be applicable.

It must be also noted that the international community has been grappling with even defining a situation within the widely accepted classifications of conflicts i.e international, non-international or internationalised armed conflict. An armed conflict is always context-dependent and the type of armed conflict will depend on varied factors mainly the involvement of nations or non-state armed actors.

Nevertheless, it is clear that over the years classification of conflicts have been further complicated due to the fact that the nature of conflict has changed drastically so as to not fit into the traditional definitions of armed conflict. This is due to the fact that conflicts between nations have been steadily declining while at the same time there is a rise of civil wars, cross border terrorist groups (al-Qaeda, LRA and Daesh). Furthermore, in today's world, internal conflicts not only spill into neighbouring nations but also impact nations that are not thousands of miles away. Classifying this type of conflict within the neat categories that were identified even a decade ago is not possible. This proves to be a hurdle when as mentioned previously protection measures are considered.

There is no doubt that there is an evolution of actions of armed groups towards attacking critical infrastructure, including water installations, which is unlikely to abate. Once these tactics are even moderately successful, other groups will likely also start to use them. This is the reason why this is termed as an evolution in the actions of the non-state actors. However, due to the political, legal and technical vacuum the lack of classification of new forms of conflict poses, any counter measures and any form of humanitarian assistance is certainly challenging.

D. International Law applicable to Water Resources And Infrastructure During Armed Conflict

- 1997 UN Water Courses Convention (Article 29)
- Geneva Convention IV Relating to the Protection of Civilian Persons in Time of War, 1949 (Article 53)
- Additional Protocol to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) 1977 (Article 54, 55, 56)
- Additional Protocol to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II) 1977 (Article 14, 15)
- Rome Statute of the International Criminal Court(ICC),1998 (8(2)(b)(iv), Article 8(2)(b)(xxv)), Article 8(2)(e)(xiii)
- Convention on the Prohibition of Military or Any Other Hostile Use of Environmental modification Techniques (ENMOD), 1977 (Article I, II)

a) Water resources: civilian object

In general, civilian objects are afforded protection under international humanitarian law, thereby guaranteeing immunity to these objects from attack during armed conflict. Water is also included within the ambit of civilian object. Nevertheless, water by virtue of being "*indispensable to the survival of the civilian population"* is afforded special protection under Additional Protocols I and II of the Geneva Conventions as stated below.

b) Special protection for water resources and infrastructure/ Prohibition

- *Prohibition against attack, destruction or rendering useless water and water infrastructure*

Article 54(2) of Additional Protocol I states that "*It is prohibited to attack, destroy, remove, or render useless objects indispensable to the survival of the civilian population, such as … drinking water installations and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive."* Similar protection is afforded under Additional Protocol II under Article 14. Furthermore, this rule is deemed to be customary international law applicable both in international and non-international armed conflicts. It is said that the definition of *'water installations'* is ambiguous, however in practise it tends to refer to large entities which are vital to prevent starvation of civilians. This provision could also be construed to cover situations of control of large infrastructure. Article 53 of Geneva Convention IV prohibits 'Occupying' power from destroying property belonging to the state.

- *Prohibition against starvation*

In any armed conflict, the starvation of civilians as a method of warfare is expressly prohibited in both international and non-international armed conflicts as seen from Article 54 of Additional Protocol I and Article 14 of Additional Protocol II. A violation of these provisions may be considered a war crime. Since water is needed to avoiding starvation the prohibition of starvation given under the Geneva Convention and its Protocols thus applies in the context of water as well.

- *Prohibition of attacks against dangerous forces*

The Protocols also prohibit the attack on "*Works or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations….even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population*." (Additional Protocol 1, Article 56). It must be noted that while Protocol I does provide that if these installations are used for "*significant and direct support for the military*", then derogation from the rule could be allowed and the object can be attacked. The principles of military necessity and proportionality as laid down under Article 51(5) (b) and 52 of Protocol-I would certainly be applicable when deciding upon the derogation mentioned above. The parties to the armed conflict are also under an obligation to ensure they take all measures necessary to protect civilians and civilian objects(Article 57 of Protocol-I).

However, Additional Protocol II applicable in non-international armed conflicts affords no such derogation/exception. The Protocol-II especially, under Articles 14 and 15 lays down stringent provisions when it comes to the protection of water resources.

- Protection of Environment

Provisions of Additional Protocol-I give protection to the environment during armed conflicts, as seen mainly in Articles 35 and 55. Article 35 states that: *"it is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment"*. Article 55 focuses on the survival of civilian populations stating that: "*1. Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population", and "2. Attacks against the natural environment by way of reprisals are prohibited."*

Although neither of these provisions directly mentions water, it can be assumed that water, as an integral part of the environment, is afforded protection under these rules, as well as those established to protect the environment.

Furthermore, the Environmental Modification Convention (ENMOD) which came into existence due to the severe environmental damages that were inflicted by the use of chemicals and defoliants by the United States against Vietnam offers some degree of protection to water and facilities as well. For example, the case of two events in Iraq could have widespread implications: the burning of oil wells at the end of the Gulf War, and the diversion of the Euphrates with the object of drying up wetlands in the south, were both intentional, part of an armed conflict, and may have long-term consequences for the environment and regional climate.

c) 1997 UN Watercourses Convention and International Humanitarian Law

The 1997 UN Watercourses Convention further validates this protection under International Humanitarian Law for not just water infrastructure but also for international watercourses. Article 29 states "*International Water Courses and related installations facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in International and non-international armed conflict and shall not be used in violation of those principles and rules."*

d) Human Right to Water applicable during armed conflicts

Right to Water is guaranteed under International Covenant to Economic Social and Cultural Rights (ICCPR). Right to Water as per the General Comment No. 15 adopted by the UN Committee on Economic, Social and Cultural Rights is the right for everyone to have "sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use." The right entails inter alia the prohibition of threat to the physical security of any person while accessing water facilities and services. In the case of Mozambique where landmines were deliberately strewn near wells was a clear violation of the right. It must be noted that the right cannot be derogated from during armed conflicts or emergency situations.

e) Targeting of water resources and infrastructure: War crime

International Criminal Law under the ICC Statute declares the intentional destruction of civilian property and natural environment in an international armed conflict a war crime and water infrastructure could certainly be construed to be included within its ambit (Article 8(2) (b) (iv)).

It also prohibits in an international armed conflict the use of starvation as a method of warfare terming it a war crime. Denial of water is also a means of starvation (Article 8(2) (b) (xxv)).

It must be noted that the aforementioned provisions are not applicable to internal armed conflicts. The Rome statute under Article 8 gives more scope for prosecution for crimes committed against water resources and infrastructure in international armed conflict than internal. However, under, Article 8(2)(b)(iv) which is applicable in non-international armed conflict, the intentional use of poison is regarded as a war crime and this could be applied in cases of poisoning water sources.

Though there has been no prosecution made for attacks against water installations or for water related starvation as yet at the ICC, the option certainly exists. This would perhaps push parties to the armed conflict to follow the rules of war and be accountable for their actions.

E. Recommendations

The protection of water requires a focused approach by the international community. This would entail a high level political recognition that water, a scarce entity requires better standards of protection, during and post armed conflict, now more than ever. The culmination of this focus could be in terms of a legal instrument specifically addressing water as well as the implementation of the existing rules applicable to water. In this regard, the following recommendations are being made:

1. Developing instruments specifically aiming at protection of water resources and infrastructure during and post armed conflict

The Geneva Conventions to which almost all countries in the world are parties to, does not directly address the issue of water resource and infrastructure damage during an armed conflict. And while the Protocols to the Geneva Conventions afford good protection to water, most countries in the world which are currently embroiled in armed conflict are not a party to the Protocols. This is the same with the 1997 UN Watercourses Convention which currently has about 35 member states. Asking for the ratification of these instruments could go a long way in the protection of water resources. It must be noted that ICRC along with several countries are encouraging member states to ratify the Protocols and their efforts have led to about 120 nations ratifying the same. Further efforts are being made to ensure full ratification. This unfortunately is not the case with respect to the 1997 UN Convention. While there are efforts to encourage ratification and adherence, it cannot be determined as to how long the process will take and whether it will be successful.

Also, while some of the provisions under the Protocols maybe regarded as customary international law thereby being applicable to even non-parties to the instrument, it simply is not enough to protect the scarce resource. Furthermore, it is argued that clubbing water with other environmental issues deny it an appropriate legal shield.

Hence the following measures could be suggested which will complement the efforts of the international community along with implementation of provisions already in existence:

- *Security Council Resolution on Water Peace and Security:* A UNSC resolution would lead to the recognition of water as a strategic resource of humanity. Encouraging that this be passed with a clause for the protection of water resources and related infrastructure could have multiple implications. This would help focusing the international community's attention on the specific issue of water and water infrastructure protection during conflict. It could form a basis for the UNSC mandate for UN peacekeeping operations for protection of water and water infrastructure (role of peacekeepers discussed further in point 11), much like how UNSC Resolution 1325 on women and children, has influenced peacekeeping operations. A Security Council resolution has the potential to ensure changes at an international level to trickle down to the local or domestic level. Hence, it would be possible for countries to adopt regional or domestic measures to further afford protection to water. This would be quite similar to the UNSC resolution 2286 (2016), adopted on 4th April 2016 condemning the attacks against medical facilities and personnel in armed conflicts. While this is a non-binding resolution, it not only shines a spotlight on the issues of attacks on hospitals but it also encourages international community to take strict measures including instituting criminal proceedings for violations.
- *General Assembly Resolution:* In the last decade the international community has asked for the passage of a General Assembly resolution which would be an important tool in establishing customary international law. While GA resolutions are non-binding, they still act as an important tool to advance the standards of international humanitarian law.
- *A separate legal instrument on the protection of water and water infrastructure:* Much like the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict, a separate legal regime could help towards protection. Of significance is the International Law Association's *Resolution on the Protection of Water Resources and Water Installations in Times of Armed Conflict*, Madrid, 1976. It is not binding, but the resolution which contains eight provisions in total, succinctly addresses issue of protection of water resources and infrastructure during armed conflict. This could certainly serve as a guiding body for a future binding agreement that specifically addresses this issue. An international instrument can also address the protection of related or inter-connected infrastructure necessary for the supply of water. Furthermore, the international instrument can cover the lacunae in the Rome Statute, pointed out earlier, by bringing within its ambit the violence against water resources and infrastructure in an 'internal armed conflict'.

2. Recognising the interconnectedness of laws

It is argued that the linkage between international humanitarian law and other areas of law such as human rights law and the law on transboundary water resources may ensure better protection of water during armed conflict. The Right to Water for example, recognised under International Covenant for Economic, Social and Cultural Rights casts an obligation on State parties to ensure that not only is this right realised even during emergencies, but it casts a duty on the state to prioritise the vulnerable population in realising this right as well as ensure that the state does not indulge in any form of discrimination with respect to the realization of this right.

3. Global effort to recognise and prevent acts of terror against water resources and related infrastructure

The acts of terror perpetrated by certain groups are considered outside the scope of armed conflict, which is the basis for the application of international humanitarian law. Hence, it will be a matter of debate to determine whether large scale destruction caused to water infrastructure by Maoists in Nepal, rebel groups in Colombia or even the Al Qaida, which often threatens to target water infrastructure, could be held accountable for violation under the Geneva Conventions or its Protocol. On 22, April 2016, Senegal's President Macky Sall, chairing the Arria formula meeting at the UNSC said that the "placing of the protection of international watercourses in the context of the fight against terrorism is urgent more than ever to keep in mind the temptation of terrorist groups to attack this strategic resource."

In the absences of a global legal regime that would be applicable to such acts of terror, there should be efforts made to not only garner the support of the international community in recognising and preventing such actions but also strengthen institutions like the UN Centre for International Crime Prevention, as well as the INTERPOL, which will help prevent as well as help with the prosecution of people involved in terror activities.

In December 2015, Saudi Arabia announced the launch of the Islamic Military Alliance to fight terrorism. Such alliances may specifically consider protection of water infrastructure against terrorist attacks.

4. Trusteeship under international law to protect water infrastructure

The international community is most familiar with the concept of trusteeship in the case of trust territories and the role of the UN Trusteeship Council. However, the Trusteeship Council has never played a direct role environment law or related issues. The only instance relating to environment where the Council played a role, although indirectly, was in the case concerning *Certain Phosphates Land in Nauru.* The island nation of Nauru had asked the Council to declare a breach of the trusteeship agreement between Australia, New Zealand and UK as Australia's phosphate mining activities in Nauru was in violation of international law.

Due to the declining number of trusteeships, there have been proposals to bestow the Trusteeship Council with alternative functions. One idea, put forward by Mikhail Gorbachev was to ensure the inclusion of environmental protection within the ambit trusteeship. However, this idea was rejected at the Earth Summit of 1992 despite receiving widespread attention. A lot has changed since then, however the idea seems more applicable in the present day than before. A revival of the idea, of course in a different form befitting the current context of protection of water infrastructure could certainly be considered.

The idea of trusteeship can be further used to protect key water infrastructure. This would entail designating key water resources or infrastructure most valuable to people. The states would have a corresponding duty to protect this heritage for future generations. These states should therefore be considered as trustees that have a responsibility to protect and prevent the destruction of infrastructure, and if they are unable to do so, they should be obligated to request assistance from

the international community. A third party state could also be entrusted as a trustee. In this situation, while questions of sovereignty and the right of states over their own resource does arise, a trustee by virtue of a strong agreement would only have such role as given to them by the consenting state in whose territory the infrastructure exists.

5. Generation and sharing of sufficient data with respect to water and infrastructure

There is usually a lack of sufficient data with regards to water infrastructure damage during armed conflict. Data collection on the subject matter of destruction of water infrastructure during armed conflicts by state and non-state actors is not something that is done on a large scale and on a systematic basis. A lot of times, records of Infrastructure damage get destroyed during conflicts or are deliberately destroyed in order to avoid culpability. Furthermore, when there is a lack of sufficient proof, all claims for damage or destruction of infrastructure fail. Focus on collection of systematic information from various sources could help. The civil society that works on the ground share the data that they have gathered, which will help towards protection as well as coordination of humanitarian assistance. In this regard UN peacekeepers could also assist. There is a call to ensure that Peacekeeping missions have the responsibility to collect information which would aid humanitarian assistance, as well as help towards prosecutorial efforts when criminal activities are recognised. Recognising that there are various actors who can help in gathering important data as well as ensuring better coordination between them all would go a long way in the protection of the infrastructure.

It can also be suggested that an independent international or global body can be given the task of collecting and disbursing requisite data to the entities that can help in the humanitarian crisis. The body can also look at the task of coordination especially on critical data collection and dissemination to and from humanitarian actors working in the field.

Furthermore, a side event at the UN General Assembly session in New York convened to discuss the issue of data monitoring on the impact of armed conflict and acts of terror on water resources and infrastructure maybe undertaken. This would further help in highlighting the importance of the data collection issue in the political arena with collaboration of civil society thereby creating a space for further action.

6. Focusing on regional and religious laws where appropriate

Apart from the international rules and regulations there exist regional and even religious law which may help towards protection. This may appeal to certain sections or groups to at least come to the negotiating table who would otherwise view International Humanitarian Law as a western or an alien construct. For example, it is said that Islamic law expressly forbids the poisoning of water in the arid regions in which Islam was born. Article 3(b) of the 1990 Cairo Declaration on Human Rights in Islam, which deals with the protection of civilians in times of armed conflict, provides: *"It is prohibited to fell trees, to damage crops or livestock, and to destroy the enemy's civilian buildings and installations by shelling, blasting or any other means."*

Islamic Law goes into great detail on the subject of water to ensure the fair and equitable distribution of water within the community.

The Arabic word for Islamic Law "Shari`ah" is claimed to be closely related to water. Arabic dictionaries define the word as “the place from which one descends to water.” It is said that before Islam was born, the Shari`ah was a series of rules about the use of water called the shir`at al-maa’. The term later was developed to include the body of laws and rules given by God.

Under Islam, water is considered a gift of God and which every human being is entitled to. It states that water should be freely available to all and it is a sin to withhold water that is in surplus.

Islam as seen in Quran and other religious texts has laid down a series of rules which touches upon conservation of water resources, prevention of water pollution and preservation of environment. The participation of all people in such conservation efforts is also stressed upon. A Fatwa specifically speaks about all Muslims should take measures towards environmental education. But most importantly Islam also stresses on the fact that everyone and not only Muslims have a right to water.

This is an aspect that could be explored further to possibly counter threats from Daesh and other groups. However, an in-depth knowledge and understanding of the compatibilities of humanitarian law and religious law is necessary and must be focused upon before identifying entry points of engagement. Having religious and influential leaders to talk about the issue could be useful. The point is to not restrict the scope of water to policy makers and NGOs but use every possible influential system to convey the importance of protection of water resources and infrastructure.

7. Engaging with Armed Non State Actors

It is essential in conflict situations to engage with both state and non-state actors in order to reach out to civilians in need of assistance, as well as protection. While it may be relatively easier to engage with states, armed non state actors present a greater challenge. Nevertheless, non-state armed actors are a part of the problem in today’s conflicts as much as they must sometimes be part of the solution.

Insurgents and other armed groups are often seen as inherently predatory and hostile. Yet a meaningful engagement with them can be undertaken as Armed Non State Actors (ANSAs) too get largely motivated by self-interest for engaging in talks. Sudan People’s Liberation Movement-North (SPLM-N) of South Sudan engaged in talks realising that following rules under International Humanitarian Law would grant them greater legitimacy. Fear of individual criminal prosecution on non-compliance with specific international norms is another motivating factor, not to underrate the advantage of acquiring basic resources for population under their control. Once the motivation of the ANSA to engage is identified, it can pave way for effective dialogue.

The success of negotiations with armed groups depends greatly on the relationship developed with them at all levels. Leaders of an armed group can give better possibility of access to the group which will help creating channels for the resolution of conflicts. However, this is possible when there ANSA

has a distinct chain of command. In the case of Daesh the strategy to engage with them was to approach them at the level of people who could make simple decisions such as giving access to hospitals or perhaps even water resources.

Entering into formal agreements with ANSAs would be a part of the engagement process. Protocol I to the Geneva Convention under Article 56 (6) states that *"The High Contracting Parties and the Parties to the conflict are urged to conclude further agreements among themselves to provide additional protection for objects containing dangerous forces."*

With respect to ANSAs, it must be noted that in practice there are various models of agreement or commitment ANSAs take: unilateral declarations, bilateral agreements between governments and ANSAs (usually in the context of a broader peace or ceasefire process), Memoranda of Understanding (MoU) involving international organisations or NGOs, multilateral undertakings among NSAs, and 'Deeds of Commitments'. Geneva Calls, an international NGO which pioneered the use of Deeds of Commitment states that contrary to commonly held belief, ANSAs are often willing to accept external oversight and subject themselves to scrutiny by external actors.

While Protocols to the Geneva Convention would be considered binding on the state signatories to the treaty, ANSAs also have an option to adhere to the same through Article 96(3) of Protocol I to the Geneva Convention and they could be encouraged to do the same. A nuanced understanding of how the principles of international humanitarian law are applicable to the increasing number of armed non-state actors is required and must be focused upon by the international community.

8. Role of Regional/Basin level agreements or organizations

It is seen that specific agreements on water resources have continued to be in force even during armed conflicts. For example, the Mekong Committee continued its activities during the conflict in Vietnam. Similarly, during the armed hostilities between India and Pakistan in the 1960s and 1970s, the Indus Water Treaty of 1960 remained in force and the Permanent Indus Commission established by this Treaty continued to serve as the channel of communication between the two parties. Even in the Senegal basin, between late 1980s to early 1990s, when relations between Senegal and Mauritania were strained due to boundary delimitation issues, the common management of the river basin that was agreed upon prevailed. In fact, the Senegal River Basin Organisation (OMVS) is said to have been the only forum through which the two states communicated for that period of time.

The role of pre-decided regional or basin level agreement or organization in conflict prevention and management cannot be kept aside. They serve as a channel of information and communication and build trust between states. Joint mechanisms and commissions established by water agreements may serve as an avenue for dialogue not only when peaceful relations between riparian states prevail but also when the relations are heated or even marred by violence. Hence, regional or basin level arrangements should be undoubtedly encouraged.

However, by virtue of the provision in Protocol I mentioned above, states in conflict should be further encouraged to enter into agreements that would at least protect water during and post

conflict. Water agreements may play an important role before and after an armed conflict. In particular, the agreements on transboundary water resources may contribute to mitigating the risks of conflicts and tensions between parties as well as create the conditions for durable peace in post-conflict countries. For example, the agreement on the application of International Humanitarian Law between parties to the conflict in Bosnia and Herzegovina specifically states that the parties will conduct hostilities in accordance with Article 54(2) of the Additional Protocol – I of the Geneva Convention.

In this regard, the role of peace treaties concluded after an armed conflict, which have water integrated into its provisions need to be explored. The Darfur Peace Agreement on 2006 is one such example of a peace agreement where water was addressed. The implementation of such provisions is said to be difficult for various reasons including lack of resource for monitoring and implementation and a lack of political will. Hence a concerted effort is needed by the international community and relevant actors to ensure ground level application.

9. Role of UN bodies and other organizations

There are several bodies in the world that can contribute towards the protection of water resources in armed conflict and against acts of terror. The World Water Council had identified that opportunities for field based advocacy arises through water related abuses and the bodies that do ground work can further work towards lobbying governments into taking the right actions.

While the role of some of the organizations including ICRC have been discussed separately in the paper, of significance are the two:

a. United Nations Department of Political Affairs (UNDPA)

   UNDPA has specific mandate on preventing and countering terrorism which would be useful to consider towards the protection of water resources and infrastructure. In this regard the role of UNDPA in the United Nations Counter-Terrorism Implementation Task Force (CTITF) is particularly relevant. The CTITF was created in 2005 and the UNDPA has been an active participant of the task force since its inception with the Under-Secretary-General for Political Affairs being the Chair of CTITF. The CTITF consists of 34 international entities which based on their expertise render their services towards counter-terrorism efforts.

   As mentioned previously, acts of terror against water infrastructure requires concerted efforts by the international community and this could be spearheaded by the UNDPA.

b. *The United Nations Peace Building Commission (UNPBC):* The mandate of the UNPBC is as follows:
   - "to bring together all relevant actors to marshal resources and to advise on and propose integrated strategies for post-conflict peace building and recovery;
   - to focus attention on the reconstruction and institution-building efforts necessary for recovery from conflict and to support the development of integrated strategies in order to lay the foundation for sustainable development;

- to provide recommendations and information to improve the coordination of all relevant actors within and outside the United Nations, to develop best practices, to help to ensure predictable financing for early recovery activities and to extend the period of attention given by the international community to post conflict recovery."

With UNPBC's mandate, post conflict reconstruction and early recovery for water infrastructure could be focused upon and the fact that the Peace Building Commission is already focusing significantly on the role of water in post-conflict development as well as for reconciliation efforts makes a stronger case for this body to be involved in the process of water resources and infrastructure protection.

10. Enforcement measures through judicial bodies

Few examples exist regarding enforcement measures taken through judicial means to protect water resources and infrastructure, such as in Iraq where a Panel of Commissioners of the United Nations Compensation Commission (UNCC) in their report found Iraq liable for contamination of the Raudhatain and Umm Al-Aish aquifers in Kuwait.

Another example is the award of the Eritrea–Ethiopia Claims Commission, established under the auspices of the Permanent Court of Arbitration (PCA), analysing an Ethiopian military operation against Harsile water reservoir in Eritrea. The Commission held that aerial bombardments of the water reservoir were in violation of applicable International Humanitarian Law.

When North Korea in September 2005 released massive amounts of water which resulted in flooding in parts of South Korea, it was in violation amongst other things, of the obligations to prevent transboundary harm under Right to Water. However, there is very little to show that the country was held accountable for the violation of the Right to Water. This perhaps is because of the lack of enforcement measures with respect to this right. It is to be noted that an elevation to the status of Human Right would lead to mechanisms for enforcement. But this is not the case with respect to the right to water. The committees constituted under specific human rights treaties afford some form of protection but it does require further development.

The International Criminal Court is another judicial body as mentioned previously that could be approached for the violation of International Humanitarian Law. However, as mentioned previously since the Rome Statue does not adequately cover violations with respect to water and infrastructure in a non-international armed conflict, measures must be taken towards its inclusion perhaps even in the form of an amendment to the Statute. This can be put in the agenda of the annual session of the Assembly of State Parties (ASP) to the Rome Statute.

11. Role of UN Peacekeeping Operations

Peacekeeping missions over the course of time have had the following roles to play with respect to natural resources (illustrative not exhaustive):

- Helped stabilize countries, where violent conflicts were financed by natural resources or driven by grievances over ownership, access and control of natural resources.

- Supported/Assisted national authorities or transitional governments in restoring the administration of natural resources like diamonds, gold, oil and timber.
- Dislodged armed rebel groups from a number of mining sites, and in doing so diminish their resource base.
- Conducted joint patrols with the national police to reassert control over diamond mining.
- Addressed natural resource grievances as part of their conflict resolution and reconciliation activities.
- Helped to reduce criminal exploitation of natural resources.
- Helped to reduced sexual violence by persons guarding supply routes to water resources.
- Built water wells and established water resources initiatives that involved distributing high-capacity rolling water containers to returnees.
- Helped UN Groups of Experts to support the monitoring of sanctions violations.

It was observed in the UNEP report 'Greening the Blue Helmets' that there "may be an increasing trend to include natural resource provisions in peace agreements. For example, in a review of 94 peace agreements concluded between 1989 and 2004, only 51 contained direct provisions on natural resources. However, all of the major peace agreements concluded between 2005 and 2010 included such provisions. Since 1989, land was by far the most commonly addressed resource in peace agreements, although extractive resources (oil, gas and minerals), and renewable resources (water, fisheries, forests, wildlife) are also addressed. This apparent trend could indicate an increasing awareness of the need to address natural resources as part of peace mediation."

With the roles that peacekeeping missions have played in the past with respect to natural resources, as well as the inclusion of more provisions in peace agreements which form the basis of the mandate of the peacekeeping missions, it would not be too farfetched to recommend that protection of water infrastructure be specifically included within the mandate of the peacekeeping missions where required. This would help even in the case of fragile states which lack the basic capacity to provide security, basic services and justice to their citizens and may also face specific challenges governing their natural resources in a transparent, equitable and sustainable manner. Preliminary analysis of publicly available data on the natural resources held by the 45 fragile states listed in the 2011 report by the OECD shows some 91 per cent of these countries contain either transboundary waters or biodiversity hotspots of global significance or both; while 68 per cent contain at least one World Heritage Site.

While talking about protection of water infrastructure, high technological equipment and personnel with sufficient expertise is needed for repair and maintenance. However, peacekeeping forces most of whom come from developing countries do not have that expertise. Specific training maybe required in this regard.

The peacekeeping operations could also help towards judicial enforcement. Peacekeeping missions could record and hand over any information that may be useful in the event that specific conflict actors are indicted by the International Criminal Court for violations of the Rome Statute, including acts of pillage of natural resources that contributes to war crimes, crimes against humanity and genocide.

However, there are issues that need to be considered to ensure effective peacekeeping operations with respect to water infrastructure:

- The role of peacekeepers in relation to natural resource issues is principally determined by the mandate given to the peacekeeping mission by the UN Security Council. However, one of the biggest hurdles that UN peacekeeping missions face is the lack of a systematic mandate. Often they have multiple and unclear mandates which reduce their effectiveness.
- A timely mandate is also important with respect to the protection of water infrastructure. Protection measures in such cases are required before an attack takes place or before it falls in the hands of the enemy. However, such a timely mandate is also difficult to obtain.
- Furthermore, the successful implementation of the mandate given to peacekeeping operations is fundamentally influenced by the human and financial resources made available to them and by the political willingness of the host-country together with regional and global private actors. Non-elected transitional administrations, or power sharing authorities, together with private sector actors may intentionally undermine peacekeeping efforts to restore authority in order to continue profiting from resource revenues. If host governments do not make combating the illegal exploitation of natural resources a priority, there is little leverage a peacekeeping mission can employ, despite the existence of a mandate, unless all international partners agree on the need for strong controls.

12. Strengthening law enforcement domestically

A General Assembly Resolution (GA Res 49/50) of 1994 stated that it "Invites all States to disseminate widely the revised guidelines for military manuals and instructions on the protection of the environment in times of armed conflict received from the International Committee of the Red Cross and to give due consideration to the possibility of incorporating them into their military manuals and other instructions addressed to their military personnel." ICRC thus developed 'Guidelines for Military Manuals and Instructions on the Protection of the Environment in Times of Armed Conflict', in International Review of the Red Cross, No. 311, 1996. It is observed that several countries (about 40) have already adopted this into their military manuals. It is also seen that many nations have even brought about domestic legislations that give protection to civilian infrastructure. For example; Iraq's Military Penal Code (1940) punishes anyone who destroys or wrecks, "moveable or immovable property, cuts down trees, destroys agricultural crops or orders to commit such acts", without necessity.

More such measures need to be taken in order to ensure specific protection of water infrastructure and resources.

13. Use of technological advancements to protect water resources and infrastructure during conflict and against terror attacks

The security and protection of water resources and related infrastructure can be done by the use of technology. This can be done through specific technological devices such as warning systems, anti-hijack systems, password controlled gates for water facilities, and other security devices.

In this regard, sufficient safeguard of water treatment plants need also be mentioned. Several times due to the fact that these plants are attacked, water that could be otherwise used by civilians is left

completely unusable. When stringent treatment methods are used and are coupled with treatment plants that are secure, the contamination of water especially for the purpose of using it as a weapon of war or terror is substantially reduced.

The issue of protection of water treatment plants is very important due to the following reasons:

- If a wastewater facility is damaged, then untreated water is left to flow, having a disastrous impact even on downstream nations.
- When containers holding chemicals at treatment plants are destroyed, they lead to the release of dangerous toxic substances which are deadly for humans.

It must be noted that some of the commonly used chemicals for the treatment of water such as chlorine gas could be extremely deadly during water conflict. Hence countries are seeking alternate methods of water treatment. For example, many waste water facilities in the US have switched from using Chlorine to safer alternatives such as Sodium Hypochlorite or ultraviolet light, since the terrorists attacks in 2001.

Several countries in the world have advanced technological features which they use to protect water infrastructure. However, their details are not publically available. The United States has however made some of their technology public knowledge. It should also be noted that some countries such as Singapore have seen to have adopted the technology from the US.

Given below are means used by United States to protect water resources and related infrastructure (illustrative not exhaustive):

- Risk Assessment Methodology Standard for Water and Wastewater Systems (Developed by the ASME Innovative Technologies Institute and AWWA): “Eventually this standard will provide a consistent and technically sound methodology to identify, analyse, quantify, and communicate the risks of specific terrorist attacks and natural hazards against critical water and wastewater systems and is consistent with the Risk Analysis and Management for Critical Asset Protection (RAMCAP) framework.”
- Control Systems Cybersecurity Self-Assessment Tool (CS2SAT): “For use in the Water Sector to maximize the impact of cyber security self-awareness among the utilities. The CS2SAT tool is being integrated into Water Sector risk assessment tools and is cited continuously in the Cybersecurity Roadmap.”
- Vulnerability Self-Assessment Tool (VSAT) 6.0: *“*Drinking water and wastewater utilities of all sizes can use VSAT to enhance their security and resiliency. Utilities can:
    - Identify the highest risks to mission-critical operations
    - Find the most cost-effective measures to reduce those risks

  “VSAT Version 6.0 complies with the water sector risk assessment standard and can offer liability protection under the Department of Homeland Security’s Support Anti-Terrorism by Fostering Effective Technologies (SAFETY) Act program.”
- Water Health and Economic Analysis Tool (WHEAT) 3.0: EPA created this tool to “analyse consequences for loss of one or more assets, release of a hazardous gas and Intentional drinking water contamination”. This tool is available for download as well.

- Water Infrastructure Security Software by Sandia National Laboratories: “Sandia’s water security software is designed to enable decision makers to know the following:
    - Where to place sensors (SPOT)
    - How to detect water quality events (CANARY)
    - How to rapidly locate a contaminant source (WST)
    - How to assess risk in physical infrastructure (RAM-W).”

14. Role of humanitarian organizations

Humanitarian organizations including the International Committee for the Red Cross (ICRC) can play and have been playing a major role in ensuring safe access of water for civilians and rehabilitation of infrastructure. In addition, most humanitarian organisations have a commendable record of cooperation with local actors in the effort to maintain water installations for civilians. There is however measures that need to be taken to further support the work of the humanitarian organizations.

ICRC for example is entrusted with delivering humanitarian assistance in times of emergencies like armed conflicts. However, the delivery of assistance could face several obstacles including state resistance which was seen in Sri Lanka and Myanmar. On 18th March 2016, UN called on all parties to the conflict to ensure access to safe drinking water in Donetsk city in Eastern Ukraine. It was observed that since the staff of the Voda Donbassa water treatment plant were evacuated on 13th March 2016 due to increased insecurity in Donetsk, this resulted in water scarcity issues in the area. This is also an instance where actors like ICRC can deliver little results due to the inaction of states.

In a report by the ICRC entitled ‘Bled dry: How war in the Middle East is bringing the region’s water supplies to breaking point’ the following was observed: “For the men and women of the ICRC’s water and habitat unit, often the hardest and most time-consuming part of the job is not coordinating the repairs to damaged infrastructure. Rather it is the negotiations with all parties to the conflict to guarantee safe passage for engineers, technicians and contractors, so they can assess the damage and then make the necessary repairs.” In one instance where it took the ICRC three weeks to negotiate safe access to the main water transmission pipeline, it only took them a week to repair the same. The ICRC partners with local organizations as well as water boards to help with gaining access. ICRC is also building skills in geographical information systems technology, to enable them to better handle the growing quantity and complexity of information that they receive. Satellite photos and digital mapping systems help them to get a broader overview of the situation and to better understand, analyse and exchange information. In Ethiopia, for example, they’ve worked with the authorities to develop global positioning systems and mechanisms for checking that water points are functioning properly.

It is imperative for the international community to support the work of humanitarian organizations, including finding effective means to reduce the negotiation time while also maintaining neutrality. In this regard the following can be considered:

- Encouraging collaboration with other civil society organizations working in the field that may help in gaining access. A network of local water specialists and professionals if established on the ground could not only help ICRC but also other major humanitarian organizations.

- Encouraging states to deliver sufficient information that would be relevant to the delivery of aid.
- Increased consultations with those countries that may have intelligence on the conflict in the region which will aid humanitarian assistance efforts.
- Encouraging the international community to focus on not only raising resources for aid but also ensuring that the aid reaches the population in need.

The other important area that needs to be focused on is ensuring sustained and long term 'multi-year financing' to help restore water resources and related infrastructure. This has been highlighted by ICRC in its 2016 report 'Protracted Conflict and Humanitarian Action'. Humanitarian agencies are equipped to deal with short term emergency measures, however when it comes to water it becomes a long term process especially in a protracted armed conflict. This requires sustained funding which is at the moment not a focus of development finance.

15. *Development of early warning mechanisms*

The prevention of attacks against water and infrastructure is the need of the hour. Developing early warning mechanisms that would help address issues the moment they emerge would be pertinent because it presents greater opportunities to look forward in the direction of cooperation than responding to issues after they have developed to a less manageable scale. Also, it would be logical to assume that actions taken at the lowest and insipient stages or phases of dispute would have better impact as opposed to actions taken at the higher stages of dispute.

Traditionally, an early warning mechanism is the collection, integration and analysis of data which can be developed into a comprehensive early warning report and strategies to identify stages of disputes and prevent its escalation. If the mechanism concludes that there is a possibility of conflict then the relevant decision makers are sent the analysis with the request to take measures to prevent the same. Further, development of future scenarios can be a way to sensitise decision makers to new and emerging realities encouraging them to respond appropriately and at a faster pace.

Similar such attempt can be made towards the protection of water and infrastructure. The international community is increasingly recognising the importance of such early warning mechanisms, for example: In relation to water management in Central Asia, the United Nations Regional Centre for Preventive Diplomacy for Central Asia (UNRCCA) programme of action for 2012-2014 called for the development of an early warning system taking into account the interests of all riparian nations. For the purpose of early warning systems as well as scenario planning, a list of water and related infrastructure can be made in order to determine its vulnerability and ensure its protection.

Nevertheless, the mechanisms at present mostly deal with determining the escalation of a situation into a full-fledged armed conflict. Further, there is a possibility that the states may find this intrusive due to the fact that the domestic situation in a country is being monitored. However, the nature of

early warning mechanisms is often as such that it only utilises data in the public domain. The states will have complete autonomy to either accept or denounce the findings.

A similar such exercise is carried out by the Environment and Security Initiative (ENVSEC). It assesses the situation on the ground through mapping exercises which takes into account the environment and security risks. It then identifies environment and security 'hotspots'. ENVESEC has developed cartographic tools that provide a graphic representation of these security hotspots. They use these tools to engage with various stakeholders including decision makers. Water and related infrastructure could also be identified as 'hotspots' when certain threats exists, triggering immediate action.

16. International Conference on Water, Security and Peace

It is easier to deal with a problem in its early stage than after it crosses the tipping point. While the use of water as an instrument of war is still a new phenomenon, it is necessary to draw attention to the problem and seek globally accepted solutions. This can be done by an International Conference under the auspices of the United Nations for all countries, as well as representatives of UN and other international organisations and envoys of the permanent members of the Security Council. An alternative model could be the Madrid Conference for regional state parties with support from major countries and international organisations. The conference can discuss and take decisions in support of practical solutions. At times international conferences have been helpful in setting the agenda for a region or the world. The Congress of Vienna, Paris Peace conference, Bretton Woods, Rio and other UN conferences, Madrid conference on the Middle East are some of the best known examples in history. There has never been an agenda setting conference to transform water from a source, target and weapon of conflict to an instrument of peace and cooperation. It is about time that the international community considers convening such a conference at the global level.

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Incentive Financing for Collaborative Water Infrastructure

Part 1: Introduction

Transboundary cooperation on fresh water resources can lead to or enhance economic development of a region. Firstly, water directly supports several economic activities such as agriculture, hydropower, tourism, aquaculture, navigation and other industrial activities. Efficient water management through transboundary water cooperation will lead to expansion and increased productivity of such activities. Transboundary water cooperation can also increase the profitability of economic activities. Secondly, improved water management through transboundary water cooperation could also boost other economic sectors which are also indirectly linked to water. Thirdly, transboundary water cooperation can help in managing as well as averting humanitarian crisis relating to water such as floods and droughts. This will also have an impact on economy of a country as amongst other things, loss of human lives as well as destruction of economic infrastructure can be averted. There will be lesser disruption to economic activities too.

Undoubtedly, for countries to boost economic growth there must be a focus on transboundary water cooperation. And in order to ensure that countries do in fact focus on cooperation it is proposed that incentives must be given such that nations find the advantages of cooperation far outweigh the costs of non-cooperation. Hence the creation of Blue Fund is proposed to not only serve as an incentive for cooperation on transboundary lakes and rivers between nations but to also serve as means to ensure that countries are better equipped to use transboundary fresh water resources for their economic development through cooperation. The Blue Fund will only be for fresh water resources and primarily for rivers and lakes. It is not for other water bodies such as seas and oceans.

Part 2: Creation of Blue Fund for Concessional and Preferential Funding of Transboundary Water Cooperation

Typically, the financing of water cooperation is seen to be made in following six areas:

1. *Development and implementation of a legal framework:* Transboundary water cooperation requires a robust legal instrument signed by riparian nations as well as its proper implementation. Several international bodies that focus on transboundary water cooperation tend to focus on ensuring such a legal instrument is put in place by riparian nations. For example the World Bank helped in Indus treaty negotiations as well as the cooperative Framework Agreement for the Nile.
2. *Establishment and tailoring of institutional arrangements:* When nations wish to solidify their commitment towards transboundary water cooperation, they establish institutions such as a River Basin Organizations/Commissions (RBO/RBC) based on their specific needs or

interests. After an agreement there is a natural progression of the establishment of institutions for the implementation of the agreed terms between riparian nations. Institutions are extremely important for sustained cooperation. Hence most external donors consistently focus on the establishment and development of river basin and related institutions. Donor financing therefore is heavily seen at the initial stages of the RBO establishment and development.

3. *Management costs of institutional arrangements:* In order for the RBO/RBC and other basin governance related institutions to function, their management is of utmost importance but also require sufficient financial backing. Management costs are traditionally borne by the riparian nations and are agreed upon in the transboundary water cooperation agreement. Some RBOs have mixed funding wherein the programme activities of the RBO are often funded by donors and core activities receive funding from member nations. While the management costs of RBOs varies ranging from USD 200,000 to 2 million, contributions from member states are encouraged because it exhibits an important indicator of sustainability of the RBO/RBCs.
4. *Cost of basin management:* Apart from the costs related to management of institutions, there are costs that are incurred towards processes which are required for the management of the basin which includes joint data collection, planning and monitoring. These could range from equipment costs, labour costs, scientific research and output costs. This is another area that attracts donor funding.
5. *Capacity Building:* Capacity building at all levels for actors involved in transboundary water cooperation are required. Most donors focus on capacity building processes at several levels including individual, institutional and policies through seminars, workshops, and educational activities. This is to ensure that the goals of riparian nations are met and the efforts of the nations are sustained towards the achievement of these goals.
6. *Long-Term investment in water-related infrastructure for shared river management:* Water infrastructure projects due to their very nature require long term investments. Infrastructure projects range from irrigation lines to dams, dykes, ports for navigation and other structures to facilitate development through water. Analysis of various environmental funds particularly water sector-related, show that the funds are often allocated for the first five objectives - capacity building, establishing required legal framework, establishment, and maintenance of river basin institutions as well as costs basin management functions such as data collection, planning and monitoring. The reasons are discussed in detail below.

Investment (especially long term and above 100 million USD) in water-related infrastructure such as hydropower, navigation, irrigation, afforestation and tourism for the joint management of transboundary water is not very common. This is due to the fact that the sum of money involved is very high and the investors do not see it as easily recoverable. Infrastructure projects have more risks which also include time delays. Furthermore, significant ground work is required to be done by states for private investors to make any financial contributions. When the Manantali Dam on Senegal River was proposed to be built, the riparian nations approached several donors for finance. However, only after certain steps were taken including significant ground work by the formation of the inter-state public company SOGEM for the management of the Manantali dam, did the project attract investors.

Also, new sources and financial instruments would be needed in order to mobilise necessary funds required to meet the infrastructure needs for the future. At present Multilateral Investment banks are the major providers of investment for infrastructure growth and their role will be important in the future as well especially at the early stages of new projects. Private Banks are not involved to a large extent because the perceived 'returns' on investment in large scale infrastructure may not be high enough for the banks. Also private banks focus on short term liabilities, making them less likely to hold long term assets on their balance sheets especially for an extended period of time. Nevertheless, there is scope for private sector involvement and hence a call for targeting broader group of investors has been seen.

Large infrastructure projects mentioned above require states to seek multiple sources of funding including loans from Multilateral Development Banks (MDBs). However, these loans have to be repaid along with substantial annual interests which the countries cannot always afford.

There is also the proliferation of sovereign wealth funds such as Chinese and Arab funds that are 'effectively state owned' and are financing major infrastructure work in various parts of the world especially Africa. However these funds are available to riparian nations without any consideration for other riparian countries. This effectively raises the possibility of conflict between countries. Hence, a Fund that will aim at infrastructure development by placing a premium on actual transboundary cooperation is very much the need of the hour and it can be called 'Blue Fund'.

The Blue Fund which will generate 1 billion USD annually would provide concessional financing on a long term basis to nations so they could pay interest accrued. They would in effect help nations to tap into existing funds even with a limited resource. However, these infrastructure projects must be a joint endeavour between riparian nations and promote trans-boundary cooperation. Thus, the Blue Fund would serve as an enabling mechanism which would ensure that countries that are committed towards basin wide or sub-basin cooperation are rewarded and other nations are encouraged to make transboundary cooperation a priority. The objectives and modalities of the Blue fund have been elaborated in part 5 of this paper.

It would suffice to say that the Blue Fund will be an endeavour to encourage the international community to commit finances where cooperation over water resources is valued, thereby not only promoting much-needed water infrastructure but also contributing directly to economic stability and peace-building.

Part 3: Global and Regional Funds/initiatives/organizations

Given below are some prominent funds/initiatives/organizations that have been working on financing environment protection measures including water. They have been chosen due to their profile of work (environment/ water), their size, unique functioning methods and impact.

1. Green Climate Fund (GCF)

The Green Climate Fund aims at long term climate finance under the auspices of UNFCCC to help developing countries adopt practices that will mitigate and counter climate change.

GCF has a 24 member board with a Secretariat in South Korea. The board members are chosen from blocks of nations which gives a well-balanced representation of both the developed and developing world. The blocks include – Asia-Pacific, Latin America, African Least Developed Countries, Small Island States. World Bank is the Interim Trustee. There is involvement of stakeholders as observers during board meetings.

The Fund set itself a goal of raising USD 100 billion per year by 2020. The fund's initial target was to collect USD 10 billion before it started disseminating money equally for mitigation and adaptation projects. As of July 2016, the Fund received pledges of USD 10.3 billion from 43 nations. Of the total pledges, 96 per cent amounting to USD 9.9 billion has been formally agreed upon. However, just about USD 2.6 billion is the actual sum of money in the Fund.

Following the Board's informal dialogue in Cape Town in the 1st week of February 2016, the new GCF Co-Chairs, Zaheer Fakir and Ewen McDonald, sat down together to discuss the Board's plans for 2016 and it seems that the Board has set an aspirational target to invest USD 2.5 billion during 2016. The Board had its fourteenth meeting from 12th-14th of October 2016 where it approved 745 million in funding proposals for ten projects. While, the board has been able to meet its aspiration target of funding projects worth 2.5 billion dollars, it is unclear whether this means that rest of the money in the fund i.e about 1.4 billion USD would be disbursed to fund more projects.

The broad criteria for project selection have been laid down by the Fund. It is still in the process of setting specific criteria. It seems to be making decisions on a case to case basis. The kind of projects that the GCF is funding currently could be broadly put in the category of capacity building and institutional development, although it has the scope for funding infrastructure as well.

GCF provides a process of accreditation whereby a designated authority of a government can acquire funding. It is seen that MDBs also seek such accreditation and are successful in getting the same due to their ability to comply with international standards set by GCF. A country can approach an accredited MDB for finance as well.

2. Climate Investment Fund (CIF)

Since 2008, the CIF has been leading efforts to empower changes in sectors such as energy, climate resilience, transport and forestry. The Fund has USD 8.3 billion in pledges from 14 countries. While USD 8.1 billion represents realized amounts plus unrealized amounts valued on the basis of exchange rates as of June 30, 2015, it is difficult to determine how much of the sum is actually realised. CIF has a wide geographic coverage providing 72 developing and middle income countries the resources to adapt and mitigate the effects of climate change. The fund claims to have leveraged more than USD 55 billion from other sources. CIF has a 'sunset clause', which essentially means that each of the Funds under CIF (given below) is "to conclude its operations once a new financial architecture is effective." The New Financial Mechanism is Green Climate Fund. However CIF funds have until date not ceased functioning.

Areas of funding/Funds under CIF

- *Clean Technology Fund (CTF):* Is a USD 5.3 billion fund and provides middle-income countries with highly concessional resources to scale up the demonstration, deployment, and transfer

of low carbon technologies in renewable energy, energy efficiency, and sustainable transport.

- *The Strategic Climate Fund (SCF)*: Is an umbrella fund for the USD 1.2 billion pilot program for climate resilience (PPCR), the USD 798 million Scaling Up Renewable Energy in Low Income Countries Program (SREP) and the USD 787 million Forest Investment Program (FIP).

3. Global Environment Facility (GEF)

The Global Environment Facility Trust Fund supports the implementation of multilateral environmental agreements, and serves as a financial mechanism of the UN Framework Convention on Climate Change.

Since its inception (1994), GEF has allocated USD 11.5 billion—supplemented by more than USD 57 billion in co-financing—for more than 3,200 projects in over 165 countries. GEF has allocated USD 1.1 billion in grants, with USD 4.7 billion in co-financing for 183 projects in its International Waters focal area.

It is the longest standing dedicated public climate change fund and has 186 member countries. Climate Change is one of the six focal areas supported by the GEF Trust Fund, since 1991. The fund is replenished every four years and it is currently in its 5th cycle with more than $ 1 billion for climate change projects. It is one of the only funds with 'criteria based approach' in distributing climate change finance.

The GEF administers five important trust funds as follows:

- The GEF Trust Fund
- Special Climate Change Fund
- Least Developed Countries Fund
- Adaptation Fund
- The Nagoya Protocol Implementation Fund.

Resource mobilization occurs through voluntary contributions from the member governments. The recipients of the GEF grants are also required to raise co-finance when accessing GEF.

The GEF serves as the financial mechanism to five conventions:

- The Convention on Biological Diversity
- The United Nations Framework Convention on Climate Change
- The United Nations Convention to Combat Desertification
- The Stockholm Convention on Persistent Organic Pollutants
- The Minamata Convention on Mercury.

A sample of projects of GEF in the water sector is given below:

- Over a 15-year period, from 1991 to 2007, GEF with UNDP helped countries to build a successful IWRM framework in the Danube Basin. During this period, countries were provided with significant assistance to meet the regulations laid down by the EU.

- GEF was instrumental in establishing the Nile Transboundary Environmental Action Project (NTEAP). The project was established in 2003 to provide an environmental framework of actions for the sustainable development of River Nile and support NBI countries in capacity building and enhancing cooperation in the management of the Basin environment. It was a five year project which ended in 2009.

- Slovenia, Croatia, Bosnia and Herzegovina and Serbia signed a protocol to the Sava River Basin Declaration to cooperate on groundwater management in the basin (and accompanying protocol to the existing agreement) on shared groundwater management, something not foreseen by anyone in the basin prior to the activity.

- Development and Adoption of a Strategic Action Program for Balancing Water Uses and Sustainable Natural Resource Management in the Orange-Senque River Trans-boundary Basin.

- Implementing Sustainable Integrated Water Resource and Wastewater Management in the Pacific Island Countries.

- Good Practices and Portfolio Learning in Transboundary Freshwater and Marine Legal and Institutional Frameworks.

This shows that GEF funds are not given to the creation of water assets and infrastructure.

4. EU Africa Infrastructure Trust Fund (EU-AITF)

The EU-AITF's came into existence in 2007 with "an objective to promote investment in infrastructure in Sub-Saharan Africa through various forms of grants which are blended with long-term investments by selected development finance institutions. In this way, the EU-AITF helps to mobilise additional finance for projects, thereby increasing access to energy, transport, water and communications services." Ultimately, such projects contribute to poverty reduction and help foster sustainable economic growth. EU-AITF funding is available from two different grant envelopes: a) The regional envelope promotes infrastructure projects with a demonstrable regional impact. b) The Sustainable Energy for All (SE4ALL) envelope supports regional, national and local energy projects targeting SE4ALL objectives.

Grants from the EU-AITF can take one or more of the following forms:

- "Interest rate subsidies (IRS) – can be applied in flexible ways to reduce the total amount of debt payable by the borrower
- Technical assistance (TA) – preparatory work for eligible projects, project supervision and targeted capacity building
- Direct Grants (DG) – to finance project components with social or environmental benefits
- Insurance Premia (IP) – Payment of early-stage premia for launching infrastructure projects."

The Fund's pledged contribution amount as of 30th June 2015 is EUR 811.9 million of which EUR 481.9 million is for the regional envelope and EUR 330 million is for the SE4ALL envelope. The cost

of EU-AITF supported projects in their investment phase is currently estimated at EUR 7.4bn, which is 15.3 times the volume of EU-AITF grant support.

The donors of the Fund are European Commission (EUR 647.7 million) and 12 EU Member States (EUR 164.2 million).

The Fund supports the following types of projects:

- *Energy:* geothermal, hydropower, solar power and wind power plants, transmission lines, sustainable cooking fuels, etc.
- *Transport:* road and railway networks, ports, maritime and river routes, air transport, etc.
- *Water:* water supply, treatment and sanitation plants.
- *Information and communication technologies:* submarine internet cables, satellite-based infrastructure, etc.

It is seen that more than half of projects financed by the Fund are energy related followed by transport and about 9 per cent is related to water.

Structure of the EU-AITF Fund: The Fund has various committees such as the EU-Africa Infrastructure Partnership Steering Committee, the Executive Committee of EU-AITF Donors, the Project Financiers Group, and the EU-AITF Secretariat which is housed at the European Investment Bank's headquarters in Luxembourg. These committees play a significant role in providing strategic advice for the Funds, acting as a decision-making body, bringing together development finance institutions and taking the role of treasury, accounting and other administrative roles.

5. Cooperation Fund for Water Sector

The Asian Development Bank (ADB) established a multi-donor facility in December 2001 called the Cooperation Fund for Water. The Fund was to promote effective water management policies and practices at the regional, sub regional and country levels. The major donor nations of the Fund were Netherlands and Norway and their total contributions amounted up to USD 21.5 million. The fund was closed in 2009. The fund, amongst other things, paved the way to the establishment of Network of Asian River Basin Organizations (NARBO) in 2004. NARBOs objectives amongst other things were to serve as a platform for RBOs in Asia to exchange information and experiences as well as to help RBOs in capacity building to better manage the shared resource.

6. Water Financing Partnership Facility (WFPF)

The ADB also has a Water Financing Partnership Facility (WFPF) that was established in November 2006, with initial contributions at 100 million USD. The partnership offers technical assistance and loans in three key areas: rural water, urban water, and basin water. The funding for water management projects promotes IWRM and healthy rivers. The funding may include investments in the infrastructure and management of multifunctional water regulation and hydropower facilities developed in a basin context, flood management, and the conservation and improvement of watersheds, wetlands, and ecosystems.

As of June 2015, committed contribution of WFPF from its financing partners amount to USD 102 million, of which it received USD 83.88 million. The Asian Development Bank (ADB) selection of project proposals is based on criteria agreed between the WFPF partners and ADB.

Australia, Austria, the Netherlands, Norway, Spain and Switzerland are currently the donors of WFPF. According to WFPF, the donors contribute because they see several incentives including a) *Direct and on-the-ground results* - The donors who are considered partners help to improve the lives of millions of people "b) *Increased donor harmonization and efficiency gains* - The WFPF provides an opportunity for development partners to increase donor harmonization and maximize efficiency gains and joint impact. c) *Strengthened partnerships* - The WFPF helps strengthen partnerships in the water sector among governments, donors, civil society, and the private sector at project and country level, and through regional cooperation."

7. Cooperation in International Waters in Africa (CIWA)

The Cooperation in International Waters in Africa (CIWA) was established in 2011 as a multi-donor trust fund by World Bank in partnership with partnership the governments of Denmark, Norway, Sweden, the Netherlands, and the United Kingdom. Its role is to supports riparian governments in Sub-Saharan Africa to sustainably develop its transboundary waters for growth, poverty reduction and climate resilience. "CIWA will achieve this by improving the quality and accessibility of information, strengthening institutions, and providing support for preparing and improving the quality of investments with regional benefits." CIWA is hosted by the World Bank.

CIWA has a target of mobilising USD 200 million over ten years and has made investments of USD 70 million on short term and long term projects.

CIWA is seen to be mostly engaged in fostering data and information collection and promoting the adoption of transboundary agreements, investment plans, and operational agreements as well as the establishment of relevant basin institutions, because through this it is believed that it would lead to strengthened transboundary water cooperation.

8. International Development Association (IDA)

The International Development Association (IDA) offers concessional loans and grants to the poorest developing countries in the world. The IDA's headquarters is in Washington D.C and it is a member of the World Bank Group.

It was established to complement the International Bank for Reconstruction and Development (IBRD) by lending to developing countries which wouldn't traditionally be able to get loans or grants due to their low GDP or low credit rating.

The IDA is now that the single largest funding body for economic and human development in 71 poorest countries in the world. IDA's lending is on concessional terms, i.e IDA have zero or very low interest charge. The repayments of the loans are stretched over 25 to 38 years and this includes 5 to 10 year grace period as well. IDA also provides financial aid in terms of grants as well as debt relief

measures through the Heavily Indebted Poor Countries (HIPC) and the Initiative and the Multilateral Debt Relief Initiative (MDRI). However, IDA is said to have hardened its terms of lending.

As of June 30, 2015, IDA's annual commitment has been USD 19 billion of which 13 per cent was provided as grants. IDA supports a range of development activities in primary education, health, water and sanitation, agriculture, business, climate resilience and mitigation, infrastructure, and institutional reforms. The IDA beginning from July 1, 2014 has also placed a special emphasis on "climate change, fragile and conflict-affected countries, gender equality, and inclusive growth."

While, it's difficult to tell to what extent IDA contributes to or incentivises regional cooperation, mention must be made of the CASA 1000 project which aims to create the Central Asia-South Asia Regional Electricity Market (CASAREM) by helping transfer energy from Central Asia to energy deficient South Asia. The project has seven different financiers of which one of them is the IDA and it also has a major infrastructure component. The project cost is US $ 1.17 billion which includes "contingencies, taxes and interest during construction."

Part 4: Lessons for the establishment and functioning of the Blue Fund

A. Lessons learned from the analysis of existing funds/initiative/organizations mentioned above:

- There is no 'global fund' or an 'international fund' that undertakes the financing of transboundary water infrastructure, unlike the Climate Change funds such as GCF, GIF etc.
- Most funds have a specific decision making structure involving a board, secretariat and observers who are external stakeholders. The involvement of observers is often stressed upon while evaluating the criteria for an effective funding mechanism.
- Funds have an aspirational target with respect to finance. However, they may not necessarily reach the same.
- Accreditation process: The funds tend to give money to governments directly or through designated bodies. These bodies need to apply to the fund for accreditation before the fund flows.

B. Some lessons can also be learned from how these funds have erred or failed to complete their objectives.

- The flow of funds from the funding organization/body/initiative to the government is most often riddled with red tape and could come with strings attached. For example GCF through the process of accreditation is giving its money mainly through international organizations, such as multilateral or private banks rather than directly to institutions in developing countries where the projects are taking place. This manner of acquiring funding proves to be time a consuming process for developing countries. Furthermore, private or international banks often have conditions that may be extremely tough for countries to follow which makes them less likely to receive the grant.

- Sometimes there is a failure to meet the actual criteria for which the fund was established. GCF for example has been critiqued for not been able to ban fossil fuel and some other funds have been criticised for their failure to not be able to set aside the interests of developed nations which may not completely in favour of developing world.
- Most funds aim at processes such as institutional strengthening and capacity building to promote cooperation or to build an environment for cooperation. There are only negligible funding mechanisms that specifically aim at joint infrastructure for transboundary water cooperation. Therefore, often, these funds fail to make a real, perceptible impact at the ground level.
- Funds pledged are almost never fully realised; funds raised are not always effectively allocated and subsequently disbursed. Therefore, while a fund may claim to be worth USD 20 billion or USD 100 billion, often, the amount actually reflects what the fund aspired to raise, rather than how much it has actually received and how much it is actually distributing to projects, which ends up being a fraction of the initial claim.

Part 5: Blue Fund: Objectives and Modalities

1. **Objective:** Blue Fund is a USD 1 billion fund on annual basis for concessional and preferential funding of transboundary water cooperation on fresh water resources i.e rivers and lakes. The Blue Fund is not for seas and oceans. Broadly, what the Blue Fund will aim to do is to ensure that a joint project promoting transboundary water cooperation between riparian nations which has received a promise for financial support from MDBs or other respectable financial institutions will have their interest and other related costs to be repaid covered by the Fund.

2. **Criteria:** The Fund will provide finance only if the following conditions are met-

a. *Developing countries*: The Fund will be available only for countries which are in most need for assistance.
b. *Transboundary fresh water resources*: The Fund will only be available for infrastructure related to shared fresh watercourses between nations such as lakes and rivers.
c. *Substantial Infrastructure projects:* The Fund is for water infrastructure projects that are worth USD 100 million and above and not for capacity building or institutional strengthening which is the arena of a plethora of other funds.
d. *Concessional funding*: The Fund is not going to finance infrastructure projects. It will only ensure that interest rates and other related costs of such projects are covered. The interest rates accrue when countries borrow from MDBs a substantial sum of money due to which they are often discouraged from taking the loans. The Fund will help them in this regard thereby granting them access to larger funds.
e. *Formal third party approval:* Any project that requires the support of the Blue Fund must have been approved by Multilateral Development Banks or another country which is willing to fund to ensure processes such as feasibility study and environmental impact assessment is carried out. This is to further ensure that the infrastructure project meets international standards.

f. *Preferential:* The fund is for transboundary cooperation only.
g. *Demonstrate willingness to cooperate:* Countries approaching the Fund must have demonstrated in a substantial manner their willingness to cooperate on a transboundary project through a river basin organization or through any other manner.

3. **Modalities:** The Blue Fund will be able to cover interests and other ancillary costs of infrastructure projects through the following modalities that EU Africa infrastructure Trust Fund (EU-AITF) use and they are as follows:
   - Interest rate subsidies (IRS)
   - Technical assistance (TA)
   - Insurance Premia (IP).

4. **Why is Blue Fund different from other funds?**

- While most funds aim at institutional enhancement and capacity building, the Blue Fund will help countries procure funding for substantial infrastructure projects that are transboundary in nature.
- Given that the Blue Fund will pay the interests of large-scale infrastructure projects funded by MDBs, theoretically, a USD 1 billion fund could cover at 3-3.5% subsidy which includes interest + insurance + technical assistance, which could enable projects worth USD 30 billion annually. The interest subsidy rate was calculated on the basis of the following: (LIBOR 1.2%) + (Interest 1.0%) + (fees 0.5%) + (Insurance 0.3-0.8%).
- Blue Fund is unique because it is an enabling fund. Other funds such as GEF are also enabling funds but focus on institutional enhancement and capacity development to create an environment for infrastructure cooperation. The Blue Fund is directly getting into infrastructure cooperation i.e. directly enabling.
- It will help countries to tap into existing funds with limited resource.
- It is meant for long term investments of 25 years or more, like the IDA of World Bank which funds projects for 30-40 years.
- Financial incentives can act as a catalyst for cooperation between nations.
- Blue Fund is being suggested at a time when the UN SDG Panel's main aim is to increase water finance to meet the SDGs. What the Blue Fund will be doing is to encourage the international community to set aside a part of that fund for transboundary water cooperation. This is the right time for such a fund.
- The Blue Fund will be able to also bring investments into green infrastructure which especially due to its long term impact and the costs is rarely focused upon by nations. Nations collaborating on infrastructure projects could be motivated to also consider green infrastructure through the Blue Fund.

5. **Source of funding and reasons for investing in Blue Fund:** The Blue Fund will be predominantly financed by governments. In addition, it can also receive funding from large private foundations. Infrastructure projects could be development related such as irrigation, rural development or it could be purely commercial in nature such as for energy, navigation and tourism. There is a scope for private investment when such projects of commercial nature are involved.

The Blue Fund can be attractive to donors because it can foster regional peace and stability. Previously, funding of infrastructure projects were done for the purpose of development mostly for individual nations. However, the Blue Fund can not only directly impact development but also bring about regional stability through cooperation. This component of the fund could certainly make donors invest in the fund.

While Blue Fund is proposed as one of the a new funding mechanism that should be created, it is also proposed that well established funds like Global Climate Fund (GCF) can have a separate component resembling the Blue Fund with the same objective to finance infrastructure promoting transboundary water cooperation.

6. **Disbursement of funds:**

It must be noted that USD 1 billion is a notional value. There has to be a minimum of USD 500 million which will impact USD 15 billion worth of infrastructure. Realistically the Fund cannot be more than USD 1.5 billion. The USD 1 billion is the sum that needs to be disbursed not just pledged.

7. **Dealing with the eventuality of default, currency fluctuation and other risks**

Multilateral Development Banks and other lending institutions have strict policies in place to deal with defaulters. Due diligence is done including looking at the credit rating of a country before any form of loan is sanctioned. Mechanisms like credit swaps and World Bank's Partial Risk Guarantees which operates on the principle of indemnity are but a few examples that are in place that will ensure either there is no default or a way out, in the event that there is. All MDBs have complex mechanisms in place which help to deal with cases where the countries are unable to pay the sum that is due. However, there are instances of wilful default perhaps even for political reasons. In this case it would be safe to say that the MDBs also have substantial support of the international community that will ensure compliance by borrowing nations. Most countries also have mechanisms in place to ensure that their investment is not defaulted wilfully or otherwise.

In the case of the Blue Fund, it will not be able to be used in the event a group of countries default. Nevertheless, it would be pertinent to note that when a country procures support for its project from a MDB or other such entity, the Blue Fund will also be relying on the strong measures that they have in place to ensure timely loan payment and non-default. The Blue Fund will constantly follow up with the MDB or other such entity to monitor the timely payment by nations.

There are risks related to foreign exchange which the Blue Fond will not cover. However, costs incurred due to project delays can be discussed. But the Blue Fund will only pay for a specified number of years. The time period component has been mentioned below.

8. **Time period of payment**

The Blue Fund will not fund projects in perpetuity. There will be a set time period for which the Blue Fund will provide support. The infrastructure project must be viable and the nations must take measures to ensure that it eventually leads to profits that will help them repay

their debt. In this regard, the Blue Fund can determine the time period of payment to nations on a case to case basis mostly based on when the infrastructure is projected to be viable.

9. Fund outreach and procurement process

In order for the Blue Fund to be a success, two aspects must be addressed: a) Making countries understand the benefits of Blue Fund and the benefits that the countries will receive when they use the Blue Fund. There must be a sufficient educational or outreach component of the Fund that will help popularise the idea of acquiring investments for water infrastructure through the Fund. b) The projects must be worth the investment. Herein it is important to note that there must be process to ensure that countries should have access support facility that will help them to identify, encourage and design actual projects. In this case the Global Infrastructure Facility of the World Bank which was launched in 2014 must be mentioned. It is a **"**is a global open platform that facilitates the preparation and structuring of complex infrastructure public-private partnerships (PPPs) to enable mobilization of private sector and institutional investor capital." "The GIF supports governments in bringing well-structured and bankable infrastructure projects to market. GIF's project support can cover the spectrum of design, preparation, structuring and transaction implementation activities, drawing on the combined expertise of the GIF's Technical and Advisory Partners and focusing on structures that are able to attract a wide range of private investors." The GIF could also serve as that support facility for riparian nations. The GIF could have a dedicated water component that can help countries design projects which is ecological sensitive and technological sound buy has a transboundary water component in it.

Part 6: Blue Fund Regional Test Case

In order for the international community to support a new form of funding mechanism, a pilot project has been proposed in the form of Congo Basin Blue Fund. It was proposed to help the riparian nations of Congo Basin to jointly work towards economic development by shifting focus from deforestation to benefits derived from the sustainable use of Congo River and its tributaries. The proposal has gained support from the riparian nations and the political support that the proposal has received is because the riparian nations foresee the funding as a means to ensure sustainable development leading to regional peace and stability. The proposal will be further discussed in November 2016 at COP22, Marrakesh.

Note:

- The model for the Blue Fund is one of the options for preferential and concessional funding. There could be regional Blue Funds, perhaps even targeting specific basins. Existing mechanism such as EUAITF or Water Financial Facility of ADB could also act as a host for a global or regional Blue Fund.
- Provisions to include the process of preferential and concessional funding for joint water infrastructure could be adopted by MDBs especially the ones that are newly formed.

- There is no global consensus on the term to be used to refer to a water source (rivers/lakes/aquifer) that flows from one country to another. Transboundary, international, shared are some of the ways that the countries characterise these water bodies. For the purposes of this paper such water sources are referred to as Transboundary water.

Annex-1: Other instruments to raise funding

There are other instruments that can be used to raise funding through private investors for joint infrastructure projects on transboundary water such as the Green Bonds. The World Bank has introduced the concept of Green Bonds under its 'Strategic Framework for Development and Climate Change' which it launched in 2008. The Framework aims to increase 'public and private sector activity to combat climate change'. Through Green Bonds, the World Bank seeks to raise funds through private individuals and entities, which have a fixed income, to support lending for eligible mitigation and adaption projects. Since 2008, the World Bank has issued around USD 8.5 billion equivalent in Green Bonds. Investors see advantages in buying Green Bonds as it has Triple-A credit quality which is the same as any other bonds of the World Bank. Investors also see returns in the form of environmental changes that can be brought about through the mitigation and adaptation projects that the Green Bonds will be funding.

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Preventing Conflicts over Water Quality

Fresh Water Quality Problems

Watercourses have been and are continually used as a cheap and convenient conduit for waste disposal. This was fine until there was rapid industrialization, agriculture growth with usage of pesticides and other harmful chemicals, urbanization, unsustainable and ecologically irresponsible diversions, navigation and energy usages as well as population growth. This led to highly polluted water sources which in turn affected the ecosystem as well as the lives of people dependent on the water.

According to UN Water, in developing countries, about 90 per cent of the wastewater flows untreated into fresh water bodies and highly productive coastal zones and globally about 80 per cent of used water is not collected or treated. It is estimated that more than 80 per cent of the transboundary river basins have severe water quality issues and this can be seen both in developed and developing countries. While the developed nations in North America and Europe have water quality issues relating to nutrient over enrichment, the developing nations in South America, Africa, and in northern Asian basins along with Russia suffers from pathogen related quality issues. Some countries in emerging economies in southern and eastern Asia suffer from both nutrient and pathogen related issues.

Hence the international community regards the maintenance and restoration of water quality as an urgent measure to be taken in order to afford a better living for people at present and in the future.

However, nothing that is proposed and is being worked upon is enough to prevent and mitigate water pollution. It must be noted that while technical, legal as well as political advancements have been made, they are highly fragmented i.e they are different in each region and each country. Furthermore these advancements are simply not keeping with the demographic and developmental changes that are occurring at a fast pace.

When it comes to international watercourses, the problem of water quality is complex. This is because most times the focus of transboundary water cooperation is on water quantity and allocation rather than joint management of quality. The deterioration of the quality of water will have an impact on the relations between nations leading to disputes and possible impact on peace and stability.

GuaRio Lempa for example is a river that originates in Guatemala and flows into El Salvador where it forms a major source of water. Mining activities in Guatemala have started to pollute the river which will affect the downstream nation. However Guatemala does not wish to enter into any agreement as it would mean measures to control mining and in turn development. These kinds of conflicts can certainly be avoided now and in the future if a path to balance development and quality control is shown and transboundary water cooperation is encouraged.

As per a study conducted by UNEP under its Transboundary Water Assessment Programme (TWAP), the results from the 'business-as-usual' projections analysis show risks to transboundary river basins in terms of water quality are projected to increase in the next 15-30 years due to climate change, socioeconomic development, and increasing populations.

The projected scenario for nutrient pollution suggests that the relative risk will increase in around 30 per cent of basins between 2000 and 2030. And half the population living in transboundary river basins i.e approximately 1.4 billion people face serious and increasing nutrient pollution risks. The effects of nutrient pollution are also likely to exacerbate risks across other sectors and water systems such as the ecosystem health, coastal areas and aquifers.

The population of the world will reach about 9.6 billion in 2050. More than 6 billion of this population would be living in urban areas. This will lead to an increase in need for water in the domestic, agricultural, industrial and energy sectors. This as mentioned previously will affect the quality of freshwater resources. It is predicted that the risk nutrient or waste water pollution high in 218 out of 286 basins. This is because several countries do not take measures to treat major sources of pollution. This leads to untreated industrial, agricultural as well as urban wastes to be discharged into fresh water bodies. The effluents from these sources can even affect ground water.

Four hotspots in the world have been identified by TWAP, based on the combined projected impacts for five indicators: Environmental Water Stress, Human Water Stress, Nutrient Pollution, Exacerbating Factors to Hydropolitical Tension, and Change in Population Density. They are:

- Orange and Limpopo basins, Southern Africa which will affect countries including Botswana, Lesotho, Mozambique, Namibia, South Africa, and Zimbabwe.
- Certain Central Asian river basins such as Tarim, Indus, Aral Sea, Helmand, Murgab, Hari, Talas, Shu and Ili which will impact Afghanistan, China, India, Iran, Kazakhstan, Kyrgyzstan, Nepal, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.
- Ganges-Brahmaputra-Meghna basin which will greatly impact Bangladesh, Bhutan, China, India, Myanmar, Nepal.
- Certain basins in the Middle East such as the Orontes, Jordan River, Euphrates and Tigris which will affect Egypt, Iraq, Iran, Israel, Jordan, Lebanon, Palestine, Saudi Arabia, Syria, and Turkey.

Risks relating to water quality are projected to increase in the next 15-30 years, particularly for the four hotspots and there must be action taken such that future costs and impacts are reduced. This action entails transboundary cooperation and joint actions by riparian nations to address water quality issues. These joint actions will further contribute to regional stability and peace.

The issue of quality could become a factor of unification and cooperation as well. The Danube River is an example where quality became an engine for cooperation. The riparian nations had difficult relations as they were recovering from conflicts. However, the deteriorating quality of the Danube River became a point of common action for all the nations to work towards.

However, it is seen that most countries around the globe are not considering water quality a priority so as to allocate adequate resource for management. Unless there is an urgent need in case of spills or severe deterioration of quality, there is usually no action taken.

This form of a reactionary policy as opposed to an anticipatory and preventive approach can be counter-productive especially because the economic costs of cleaning up a water body is immensely higher than the costs involved in taking affirmative and timely actions to maintain the quality of the

water bodies. Furthermore, as mentioned previously the deterioration of the quality of water can impact relations between nations in the future. Hence, focusing on preventive measures would be extremely helpful in this regard.

As transboundary cooperation is further emphasised in Sustainable Goals Goal 6.5 which stresses the need to "expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies", nations have a responsibility to act on this matter for ensuring regional and global peace.

Recommendations:

1. **Global Advisory Body**

The establishment of a global advisory body/agency/ working group to promote transboundary water quality management would be helpful. In order to assist Water Framework Directive implementation, the EU Member States developed the Water Framework Directive Common Implementation Strategy (WFD CIS), which was agreed in May 2001. Member States were encouraged to contribute to working groups which analysed best practices in river basin planning. This led to a series of projects which promoted certain key initiatives which amongst other things included the promotion of information sharing. Similar body can be established at a global level in order to further the process of water quality management.

The global advisory body could encourage additional ratifications of the UNECE convention and serve as a "catalyst" to help those countries that may wish to improve their practice without immediately accepting the demanding obligations of the UNECE convention.

It is also said by experts that the quality clause in the 1997 UN watercourses Convention is weak and this was because when it was being negotiated twenty years ago, the awareness relating to various aspects of quality including the role of micro-nutrients and micro-organisms was very low. However, it seems far more relevant now. The global advisory body could look into this aspect and suggest measures that would help nations to make relevant changes that are needed now and required for the future.

2. **Pollution Prevention And Mitigation Measures through Transboundary Cooperation**

When it comes to transboundary watercourses, it should be noted that pollution prevention and mitigation measures have to be taken by all riparians in cooperation. The success of such measures greatly depends on joint and coordinated actions between countries for the entire basin. One such example that can be given is of the Great Lakes Quality Agreement between Canada and United States which was first signed in 1972. The Preamble of the Agreement also stated that the Parties were "[c]convinced that the best means to achieve improved water quality in the Great Lakes System is through the adoption of common objectives, the development and implementation of cooperative programs and other measures, and the assignment of special responsibilities and functions to the International Joint Commission". This Agreement serves as guidelines for U.S and Canada to collaborate on measures to improve the quality of Great Lakes and is said to serve as a model of cooperation to maintain water quality of a shared watercourse. The agreement has been

renewed several times, the latest being in 2012 which stresses upon preventive measures for ecological protection. It can be seen through this that while countries are expected to take measures domestically to prevent and mitigate water pollution on shared watercourses; they are also expected to do the same in coordination, thereby strengthening such measures.

It must be noted however that pollution prevention and mitigation is a challenge for all nations in the world. It is said that two-thirds of basins have poor wastewater treatment i.e at least 70% of the world's transboundary river basins suffer from inadequate wastewater treatment, with serious implications for ecosystems and downstream uses of the resource. There are several measures that have been adopted to prevent and mitigate pollution such as:

- Israel has established decentralized plants to be operated at a community level. Israel has the highest reuse rate in the world (around 70 per cent). Aqwise Wise Water Technologies uses 12mm biomass carriers in a process called AGAR (Attached Growth Airlift Reactor) in a biological plant. This works on a community-level because no new infrastructure is needed, and the costs are one-third of the conventional treatment plants. Israel is also looking at optimization process whereby farmers tend to use less quantity fresh water obtained through desalination than more quantity recycled salty water.
- South Africa introduced the Municipal Green Drop Certification Programme in 2008 as an incentive-based regulation for wastewater quality and wastewater management systems. In 2011, 821 wastewater systems were assessed by the Department of Water Affairs, of which 40 systems achieved the coveted Green Drop status.
- Waste Water treatment is also an essential means to augment water. Singapore for example has a 100 per cent sewerage connection and puts wastewater through secondary treatment by advanced dual-membrane and ultraviolet technologies. Recycled water is further sent to industries and commercial projects for reuse. Presently, this meets 30 per cent of Singapore's total water demand. By 2060, NEWater is estimated to meet 50 per cent of Singapore's future water demand.

However, it is seen that measures taken by nations are mostly domestic and related to their share of the river. It is time for the international community to look at a shared watercourse as a single entity and take joint and coordinated measures to prevent the deterioration of water quality. In this regard it must be noted that a river basin organization (RBO) could play a significant role and an RBO can achieve significant strides as it has the capability to do what individual states cannot achieve on their own.

3. Protection of Transboundary Aquifers

It is predicted that by 2050 the Ground Water Development Stress (GDS) i.e globally will double. New hotspots, largely driven by population pressure, are projected to develop mainly in Sub-Saharan Africa, China and Mexico. The transboundary aquifers located in Botswana, the Middle East and North Africa region, South Asia and parts of Central Asia are projected to have the highest stress in the future.

However, there is an alarming lack of modern data relating to transboundary aquifers and its dependent ecosystems. A standardised data set that quantifies key groundwater parameters is not yet developed.

There is also a lack of adequate governance structure to ensure an equitable and reasonable use of transboundary groundwater at global, regional or local level. And the lack of management of transboundary aquifers has led to several disputes and has adversely affected the security of the regions; an example of the same would be the deteriorating quality of the aquifers shared by Israel and Palestinian territories. The quality of their potable aquifer water resources has been steadily deteriorating and they are of brackish quality or otherwise polluted. Global warming, human activity and negligence have led to the pollution of transboundary aquifers including an increase in salinity. This is a constant cause of conflict between the two regions.

Hence, the protection of transboundary aquifer is urgently required and it can only be achieved through transboundary cooperation. However, according to TWAP assessment except for a few transboundary aquifers, all others lack governance and institutional frameworks. Hence, it is recommended that in order to preserve this scarce water resources, riparian nations must take joint measures to:

a) Undertake studies to understand transboundary aquifers and issues specifically relating to their quality and quantity, as well as that of the dependent ecosystem.
b) Develop standardised data collection system on transboundary aquifers.
c) Undertake joint measures to counter any threat that it might have assessed to the transboundary aquifers.

Furthermore the option of having appropriate legal instruments applicable both at the global and regional level must be seriously explored because only a handful of specific agreements on transboundary aquifers exist. As of 2016, only six transboundary aquifers are covered with specific agreements and two aquifers with informal agreements. The (non-binding) UN Resolution 63/124 (2008) on the Law of Transboundary Aquifers shows support by nations for the management, protection and conservation of transboundary aquifers. However, the principles of customary international water law, and the UN Resolution, cannot serve as a substitute for a legally-binding transboundary aquifer agreement.

Hence, protection of transboundary aquifers will require global and regional legal instruments coupled with institutional and management support by all the countries in the world.

4. Water Quality Data: Global Network and Basin Wide Measures

Data is extremely to understanding the challenges related to water quality and recommending solution. In the absence of adequate and timely data, the identification and prevention of water quality issues cannot be done. When data related to the quality of water in shared rivers, lakes and aquifers is collected and shared, it becomes easier for nations to not only counter the threat of quality deterioration but also take measure of preventing the same. However, in spite of the importance of data on water quality, there is a major gap in monitoring efforts especially at the global level. Further, much like the issues relating to the data on quantity, it is seen that in regions where water quality data is collected, they are either limited in scope or not standardised, thereby limiting its usefulness. The biggest challenge arises when nations refuse to share data with other riparians.

In this regards there are a few options that the countries can use:

a) Global Data Monitoring and Network tools

The United Nations Environment Programme's (UNEP) Global Environment Monitoring System (GEMS) was launched in 1978 and it is considered to be the primary source for world quality data. It was launched to collect water quality data from participating countries. On 22nd March 2006 at the World Water Forum in Mexico, the GEMs established an online global database which is also an open web source for water quality data called GEMstat. Thus GEMS which has 83 participating countries from across the world has managed to create a 'unique global water quality monitoring network' which gives water quality data to a central database known as GEMStat.

GEMSstat provides necessary tools as well as required capacity building measures such as training, advice and assessment tools for nations to establish monitoring programmes and conduct assessments of water quality. Countries can surely use of this global programme to enhance their quality monitoring and ensure that it is regularly undertaken.

b) Basin Wide Water Quality Data Collection and Monitoring

There are several successful examples of endeavours undertaken by riparian nations to collect and exchange water quality data. It's either collected individually by states and then shared, or it is done through an RBO. Some even have a mechanism of both individual and joint collection of data whereby while each riparian nation may individually collect data and then share the same with other, there is also a periodic joint monitoring and collection process whereby a team of experts which comprises of all riparians go to each individual state to collect data. This encourages transparency. However, the easiest and the most efficient way to gather and share data are with the help of an RBO. It can standardise the monitoring and collection of data, collect the same in a timely manner as well as ensure its dissemination amongst riparin nations. It is the best way to ensure frequent and regular data sharing.

It must however be borne in mind that while the quality is very specific to an area, the solution could be basin wide.

c) Water Quality Monitoring at Borders

It is recommended that systems operate independently at borders to monitor quality of water which could further help in determining transboundary water quality issues and help riparian nations take relevant measures to counter the problem. Furthermore such measures will certainly increase transparency and could be a trust building measure between nations.

5. Legal Framework

Laws to prevent and mitigate pollution of fresh water resources which are set forth in bilateral and regional treaties and global conventions such as the 1992 UNECE and 1997 UN Watercourse Conventions, Convention on Biological Diversity as well as guidelines in non-binding instruments adopted by UN bodies, regional bodies and other international organizations, including those in the non-governmental sector such as the International Law Association. These agreements have burgeoned due to political and geographical reasons however it must be noted that the rules of international environmental law to protect fresh water resources including international watercourses from pollution and overuse are mainly reflected in piecemeal and ad hoc responses to problems with particular rivers, lakes and fresh water ecosystem.

Furthermore, it is customary international law which ensures that shared waters cannot be used by nations in a manner that will prevent or limit the riparians from using the water resource in a manner that they are entitled to under the principle of equitable and reasonable utilization.

This makes it clear that the quality of freshwater should not be altered in such a way as to result in significant damage to the point that the resource may no longer be used or that its potential for use is materially diminished. This is based on the Roman maxim, *sic utere tuo ut alienum non laedus* (so use your own property as not to injure your neighbour). The Trail Smelter case for example dealt with international air pollution, but is analogous to the pollution of international streams and lakes. A smelter at Trail, British Columbia, was causing damage across the border in the United States. The arbitral tribunal hearing the case held "that, under the principles of international law ...no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another ...when the case is of serious consequence and the injury is established by clear and convincing evidence."

However, freshwater pollution still poses a world-wide problem. This is because of the following reasons:

- Most basins in the world have no cooperative legal framework of governance between riparian nations for quality or quantity.
- If there is a legal framework present then it is seen that they do not have some fundamental principles of water sharing and cooperation present under international law which will help protect the quality of water. It is seen that the legal framework of about 38 per cent of the transboundary basins worldwide have none of the agreed principles of water sharing which include (a) the principle of equitable and reasonable utilization; (b) the principle of no harm; (c) the principle of cooperation and information exchange; (d) the principle of prior notification, consultation and negotiation; (e) the principle of peaceful settlement of disputes. And these are also basins that have not ratified the global water conventions.
- Some riparian nations are reluctant to sign treaties and prefer to cooperate in an informal manner on a non-legally binding, basis. The informal cooperation must however be converted to more binding and institutionalised cooperation, if water management is to be successful.
- Rules such as ‘no harm’ are generally so vague that it is more in nature of statement of principle. In addition its application is qualified by certain reservations and limitations. Pollution has usually been classified as a problem concerning the use of watercourses and hence the injury spreading by means of ground water has generally been overlooked. Also only those kinds of pollution that result in ‘substantial harm’ in the territory of another state have been declared as non-permissible. There is reluctance in recognising the states obligation to prevent water pollution in the case of a long established activity that produces such consequences. The vagueness of the definition of pollution itself is a bottleneck in the process of quality control.
- While principles of international water law have been developing over the last forty years, several river basins in the world have cooperation treaties which are much older and hence do not incorporate modern principles.

Ratification of global water conventions can improve the legal framework in river basins at risk.

In the event that there is widespread support towards the 1997 Convention, there could be an additional protocol added to the same which would have specific rules on water quality. The term ‘protocol’ is used for an additional legal instrument that complements and add to a treaty. A protocol is usually ‘optional’ because it is not automatically binding on States that have already

ratified the original treaty; States must independently ratify or accede to a protocol. Having additional protocols to the Convention will help fill the lacunae in the instrument.

There should also be widespread movement to ensure that all river basins as covered by quality control rules and regulations.

6. Refining principles of no harm, equitable unitization and polluter pays in the water quality context

In order to preserve quality, the principle of equitable distribution and no significant harm needs to be focused upon. As mentioned previously, the principles while important are difficult to implement due to the fact that there are no standards set to determine what would be regarded as equitable or harmful. However, there are basins around the globe that have been refining these principles and have been applying it in the context of quality.

The no significant harm principle is applied to cases where alteration of the quality of water could occur through discharge of domestic wastes, industrial and agricultural effluents. Basins make significant harm quantifiable and measureable. For example: in one of the basins 'harm' is considered significant when any pollution is seen to affect the recovery period of the shared river by more than five days.

Basins have also developed equitable use guidelines agreed upon by the riparian nations which not only incorporates acceptable standards of quality taken from existing World Health Organization (WHO) and World Meteorological Organization (WMO) guidelines but also takes into account the realities and needs of the basin states, thereby making it more implementable.

These exercises must be undertaken in all basins. Furthermore, the quantification of harm or making it a measurable unit could also help countries implement the principle of polluter pays. The responsible entity or state will have to pay damages based on the pollution that it has created. This will serve as deterrence and prevent pollution.

7. Governance and implementation mechanisms at regional and basin level

While legal framework is important and possibly the beginning of ensuring quality control as mentioned previously, a governance mechanism which would help in the monitoring and enforcement is equally important and is particularly lacking in majority of the river basins in the world.

It must be noted that guidelines to ensure aspects of water quality standards exist at both global and regional level and domestic level but are yet to cover all river basins.

At the regional level for example the European Union (EU) has established drinking water contaminant-level standards for member countries (Council Directive 98/83/EC). These standards help to ensure that drinking water is safe for human consumption. The Water Framework Directive in Europe established Environmental Quality Standards for 33 pollutants in surface, ground, and coastal waters (Directive 2006/7/EC). It also set standards for discharges of nitrogen and phosphorus from urban wastewater treatment plants into sensitive water bodies (Directive 98/15/EEC).

At the international level water quality guidelines exists but they addresses various aspects of water quality:

- WHO has established health-based targets for contaminants in wastewater used to irrigate crops or used in aquaculture (WHO 2006b).
- To preserve agricultural production and soil conditions, the Food and Agriculture Organization (FAO) has issued quality guidelines for irrigation water.
- FAO gives guidelines for water quality for livestock and poultry, meant to safeguard the health of the livestock and people consuming associated meat or dairy products.
- Guidelines for drinking water contaminant levels have been developed by the World Health Organization (WHO 2008).
- Similarly, standards outlining sampling, terms, measurement, and reporting of water quality, as well as definitions and measurement of service activities in the drinking and wastewater sectors, have been developed by ISO (ISO 2009).

However, what is lacking is regional and basin wide adoption of acceptable guidelines for all basins as well as proper mechanism to implement the same.

Hence, it is recommended that nations must endeavour to:

a) Adopt measures at a regional as well as basin level to improve quality of water
b) Adopt relevant domestic measures to implement the standards agreed upon internationally, regionally and at a basin level.

The difficulties in standardization have been raised several times. The standards that are applicable in Europe cannot be easily applied in countries with varying developmental and resource needs. It must be however kept in mind that the difficulties in standardization could be overcome when there is determinative scale of water quality standards. The scale will help countries to slowly improve their quality standards in order to reach the stringent standards which are applicable in other parts of the world including in Europe. The Global Advisory Panel mentioned in point 1 can help in the development of this scale.

8. Encouraging Global Water Quality Programmes/Studies

As mentioned previously there are a plethora of global and regional instruments governing the prevention of water pollution. Hence studies of the existing provisions on pollution control globally, regionally as well as in states across the globe should be encouraged. This will help determine the following:

a) Common rules of intersection on pollution prevention as well as control
b) Effective rules and regulations adopted by a state or region which would serve as a model for other nations.
c) Determine a common definition of pollution
d) The general outlook of nations towards the introduction of more streamlined global policy on water quality management.

Depending on the outcome of the aforementioned study, it could be determined if it will be possible to have a new instrument on water quality management which is binding. It is also possible that the framework convention be developed with the consensus of nations which is non-binding and has comprehensive provisions on water management. This would be in the lines of the 1992 Framework convention on climate change which later paved the way to several legally binding instruments.

Once such global programme exists which is the Transboundary Waters Assessment Programme (TWAP). TWAP was initiated by the Global Environment Facility (GEF) to create the first baseline assessment of all the planet's transboundary water resources. This serves a number of purposes, including benchmarking and knowledge exchange, identification and classification of water bodies at risk, and increased awareness of the importance and state of transboundary waters. However, TWAP in its own reports have mentioned the problems relating to lack of data. Such programmes are indeed extremely important to ensure that the international community may be able to take more nuanced policy measures.

9. Environment Protection and Rehabilitation

The quality of water is undoubtedly connected to its ecosystems or biodiversity and measures must be taken to protect it. Goal 6.6 of SDG states that "by 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes."

The threat to freshwater biodiversity is global. Extinction risk is moderate to very high in 70% of the area of transboundary river basins. This is due to deteriorating quality of water bodies. Furthermore, almost all deltas in transboundary river basins have moderate to very high risk for one or more indicator. Special attention should be paid to the impacts of upstream activities on deltas, in particular the reduction of sediment supply (resulting in sinking deltas) and of water flows due to reasons including pollution.

Internationally, the Convention on Biological Diversity (CBD) which is ratified by almost all countries in the world and is considered customary international law could help towards encouraging states to carry out their legal obligation in protecting fresh water ecosystems which is greatly affected by the quality of water. It is one of the few binding legal instruments that could ensure good quality in transboundary waters. However, it is stated that the implementation of CBD has not been satisfactory. The targets that the countries themselves had set under the convention have not been achieved. Hence, a review process has been called for in the year 2020 to see how the goals set can be achieved. The aspect of fresh water quality should be highlighted at this review process in order to garner international support.

In the meantime proactive measures need to be taken to ensure ecological sound practices are implemented at the basin level by all riparian nations. There are already several good examples: The Colorado River which is considered to be the 'Nile of North America' falls 60 miles (96.56km) short of emptying into the Sea of Cortez due to water abstraction and diversion. This led to the area becoming desert like and the effects were far reaching which included the extinction of animal species, destruction of livelihood and the emergence of drug smuggling operations.

In order to address this issue the US and Mexican government have amended their previous water sharing agreement which will help restore the river delta. This initiative is hoped to restore about 810 hectares (2,000 acres) of new wetland habitat for fish, shrimp, and about 400 species of birds in the future.

It must be noted that such rehabilitative measures can only be successful and be sustained if it is done jointly and in coordination with all riparians. In the case of the Aral Sea, Kazakhstan along with Uzbekistan cooperated in taking measures to revive the Aral Sea. There was success in as much as the Northern Aral Sea started to revive and is in much better ecological condition. However, the rest

of the Aral Sea due to the non-cooperation between the other Central Asian nations has not seen similar such progress.

A piecemeal approach could never help in restoring and reviving watercourses that have suffered ecological degradation due to pollution and other reasons. Also, this approach could lead to further discord and disharmony between nations. Hence, it is recommended that riparians must cooperate in order to ensure sustainable ecosystems.

10. Water Infrastructure and Quality Control

Water infrastructure can impact water quality. However, the construction of dams and water diversions are in progress or are continually planned in several transboundary river basins, without adequate international water cooperation instruments which would be necessary to protect water quality.

There have been calls for development of improved guidelines that would help in optimising the functioning and benefits derived from dams along with minimising the negative impact on ecosystems and water quality. These guidelines would be particularly relevant in the case of transboundary river basins where dams are in upstream countries as it would help in preventing conflicts on water quality.

Environment Impact Assessment (EIAs) that takes into account aspects of quality and the ecological balance of the transboundary watercourse should be undertaken and made mandatory for large infrastructure projects and the impetus for the same could be provided by agencies such as Multilateral Banks including the World Bank which provide investment for such projects.

It must however be noted that while EIA's and other such measures are accepted practices however, it's difficult to get nations to actually implement the same. The other issue is that while Multilateral Development Bank's also stress on environmental protection measures, these measures are however not standardised or harmonised and have a varied range of stringency along with a high level of bureaucratic formalities. These make it very hard for nations to implement the environmental standards.

The involvement of relevant stakeholders could further ensure that the infrastructure is built in an ecologically suitable manner.

11. Early Warning Mechanisms

Early Warning Systems to monitor surface and ground water is needed on transboundary water course to ensure that actions are taken in a timely manner to help prevent catastrophic events relating to water quality.

It must be noted that the an Early Warning System is not a replacement of the regular monitoring processes that is required and undertaken by the riparian nations. The system will augment the monitoring process and will help in predicting and preventing situations of emergencies relating to pollution. The establishment of warning system could also help to replace the missing link in the monitoring system of surface water bodies due to lack of timelines and parameters.

There are several basins in the world that have Early Warning Systems in place. The Danube for example has the Accident Emergency Warning System which gets activated the moment a risk of transboundary water pollution is detected which could include instances of the release of hazardous substances reaching to dangerous levels. There is an international warning sent to down-stream countries which helps them prepare for the emergency in a timely manner.

Hungary and Ukraine on the other hand have regulations that help in preventing and eliminating 'abnormal pollution of transboundary waters'. This was done by using their knowledge and experience in pollution prevention and elimination measures and pollution related damage mitigation efforts. These regulations coupled with updated joint action plans to eliminate 'abnormal pollution' can prove to be an Effective Early Warning System.

An exercise in scenario planning could also be undertaken to determine the future needs of the riparian nations in order to help balance current needs with that of the future. It will also help in determining alternative sources of water so as to further ensure quality control measures.

Annex-1

Given below is the brief analysis of the present international instruments/legal provisions dealing with the water quality issues. However, these instruments in its present form are not fully adequate to address the issue at the global level. The reasons will be seen below.

1. 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses

This is the convention of a global nature that addresses the issues of water quality amongst other things. In 1997 under the auspices of the UN and building on the work of the International Law Commission, a global framework convention on the law of Non-Navigational Uses of International watercourses was adopted, and it contains elements of which are broadly recognised to reflect customary law. It has several provisions that relate to the prevention of pollution in Trans boundary water courses. Part IV deals specifically with the protection preservation and management of ecosystems which watercourse states are under an obligation to jointly or individually protect or preserve.

Some key points under Part IV are as follows:

- States are obliged to protect and preserve the ecosystem of international watercourses under the principle of equitable and reasonable utilisation.
- States are under an obligation to prevent new sources of pollution, and reduce and control existing sources.
- States must take all necessary measures to prevent the introduction of species, alien or new, that may have detrimental effects on an ecosystem of an international watercourse resulting in significant harm to other watercourse states.
- States are also obligated to cooperate with other states to protect and preserve the marine environment.
- States are under an obligation to enter into consultations with a view to establishing joint institutional arrangements for the management of international watercourses.
- States must cooperate where necessary to regulate the flow of an international watercourse and maintain installations.

The Convention only entered into force on the 17th of August 2014 after about 20 years of its existence. This is with Vietnam becoming its 36th contracting state- the exact number required for entry into force as stipulated in Article 36 of the Convention.

Hence it can be seen that while the Convention is a global framework to that addresses issues relating to water quality, its enforceability at a global level is moot. It has at present only 38 signatories i.e about 2/3rds of the countries in the world are yet to politically accept the convention.

2. 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes

The Convention was signed on behalf of the European Community in Helsinki on 18 March 1992 and came into force in 1996. It establishes a framework for cooperation between the member countries of the United Nations Economic Commission for Europe (UNECE) on the prevention and control of pollution of trans-boundary watercourses by ensuring rational use of water resources with a view to sustainable development. It has been ratified by 34 UNECE countries.

The Convention was amended in 2003 to allow accession to non-UNECE countries, thereby making the Convention and its intergovernmental framework available to all regions of the world.

The Convention is intended to strengthen national measures for the protection and ecologically sound management of transboundary surface waters and ground waters. The Convention obliges Parties to prevent, control and reduce transboundary impact, use transboundary waters in a reasonable and equitable way and ensure their sustainable management. The Parties to the Convention undertake must a) ensure that trans-boundary waters are managed in a rational, environment-friendly manner; b)ensure that trans-boundary waters are used in a reasonable and equitable way; c)ensure conservation and restoration of ecosystems.

Any action designed to deal with water pollution must attack the pollution at source. Measures must not result directly or indirectly in a transfer of pollution to other parts of the environment. Actions of the Parties to the Convention must be guided by the following principles: a)the precautionary principle: action to avoid the release of hazardous substances must not be postponed, despite the lack of a proven causal link between the substances and the trans-boundary impact; b)the polluter pays principle: the costs of pollution prevention, control and reduction measures must be borne by the polluter; c)water resources must be managed so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs.

The means of reducing trans-boundary impact are legal, administrative, economic, technical and financial measures. The Parties may adopt water quality criteria and introduce emission limits for discharges into surface waters. This type of pollution may be avoided or reduced by using low-pollution technology. The States must establish programmes for monitoring the condition of trans-boundary waters.

While the UNECE Convention has detailed provisions on pollution control as well as a Protocol on water and health, however its wide acceptance in its form by governments around the globe is said to be difficult. This is so due to the fact that the Convention has stringent provisions on water provisions which nations around the world are not willing to be obligated under.

3. Convention on Biological Diversity (CBD)

The adoption of decision IX/19 by the ninth meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Germany, 19–30 May 2008, represents a historical milestone. This decision urged Parties to strengthen international cooperation regarding the allocation and management of water, including ratifying and implementing international watercourse agreements, as a means to implement the provisions of the CBD in this area.

It adds considerable legal and political weight to on-going efforts to improve regulatory frameworks for international cooperation regarding water. It also broadens the arguments for such cooperation by highlighting linkages between transboundary watercourse management, biodiversity conservation and sustainable use and human well-being. It enhances international dialogue and consensus building. Full and effective implementation of this decision will be a major contribution to reversing the trend in freshwater biodiversity loss and with it helping to sustain these important ecosystems and their role in human development.

However, the impact of this decision of the state parties in relation to pollution control is yet to be determined.

Hence it is suggested that a global body of rules needs to be established to address water quality issues which is more nuanced but also flexible for state parties to adopt.

4. Right to Water under the United Nations United Nations International Covenant for Civil and Political Rights(UNICCPR)

It is pertinent to note that the right to water has been elevated to the status of a human right guaranteed under the ICCPR. Hence, the states have stringent obligations under international law when it comes to guaranteeing the Right to Water to its population. It is also implied that States may not take measures that would lead to the violation of such a right in the territory of another state. However the implementation of this right poses a problem as many experts have observed that there is a lack of explicit definition as to the obligations of the State towards the realization of this right. Hence, it becomes difficult to hold states accountable for violation of this right.

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New Mechanisms for Hydro-diplomacy

A. Historical Perspective

The concept of setting up a global advisory body to foster cooperation on water which would amongst others function prevents and settle disputes on water has been deliberated upon by the international community for about two decades.

The first known introduction of the idea of a global body was by the City of Valencia in the winter of 1997 when it approached UNESCO with a proposal to create an 'International Centre for Transboundary Water Conflicts' to promote water co-operation. However, this specific initiative never materialised.

The World Commission on Water for the 21st Century which was formed in 1998 by the World Water Council, invited four former Heads of State to form a 'Sovereignty Panel' to investigate the issue of 'National Sovereignty and International Water Courses'. This Panel with the assistance of Green Cross submitted its final report with recommendations to the World Water Commission. One of the most important recommendations of the Sovereignty Panel was "the establishment of a neutral International Forum for the resolution and mediation of international water conflicts, including the position of an 'International Watercourses Ombudsman'".

The recommendations of the 'Sovereignty Panel' mentioned above were presented in a high level debate during 2nd World Water Forum in The Hague held on 22 March 2000. Dr. Mahmoud Abu Zeid, then President of the World Water Council proposed the creation of the World Commission on Water, Peace, and Security to provide an opportunity for third party mediation of shared water disputes. The role of the commission would have been to assist nations with regards to their current and potential transboundary water issues by providing an independent view. This would help to cultivate and promote common interests between parties, developing win-win solutions.

Later, the Swedish Ministry of Foreign Affairs as part of their Development Financing 2000 project commissioned a study. The study was undertaken between October 2000 and March 2001. The study, proposed that an 'International Shared Waters Facility' (ISWF) be created with a specific mandate to assist regional management of transboundary waters (including smaller basins). The ISWF has not been created as yet.

On 21 March 2003, at the conclusion of the 3rd World Water Forum, the establishment of 'International Water Cooperation Facility' was announced. The Facility was to be developed by UNESCO, World Water Council together with the Permanent Court of Arbitration (PCA) and the Universities Partnership for Transboundary Waters (UPTW) and was to be based in Paris. The Facility would on request provide 'distinct and complementary services' to aid trans-boundary water

governance by providing necessary resources, a neutral environment, political backing, professional support and dispute resolution mechanisms which would above all anticipate, prevent and resolve water conflicts. The Facility would help towards building consensus between nations on the use of shared water resources. Subsequently a report on the preparations for establishing a Water Cooperation Facility was made on 22nd May 2003 and was presented at the 5th Session of the International Hydrological Programme (IHP) Bureau in Paris, 2 – 4 June 2003.

A 2010 study as seen in the report entitled 'International Architecture for Transboundary Water Resources Management: Policy Analysis and Recommendations' discussed the need for the establishment of a global body to "promote, coordinate, facilitate and monitor global dialogue, regional strategic processes and transboundary cooperative initiatives around transboundary water management." The report also mentioned the need to have a dynamic international architecture that would be able to withstand the unpredictable and constant changes in the water sector in the coming decades.

In September 2014, a report entitled 'The Rise of Hydro-Diplomacy: Strengthening foreign policy for transboundary waters', amongst other things stated that "there is a lack of agency at the international level. This is not about creating new organisations, but about establishing an institutional setting that connects pivotal actors and reinforces and complements existing frameworks, initiatives and expertise to coordinate and execute political action. Its purpose should be to ensure systematic early warning and to support coordinated action to prevent conflicts, facilitate timely responses to emerging crises, and build the appropriate institutions for sustainable and self-reinforcing cooperation"

Till date there is no indication of the creation of any of the bodies mentioned above. In fact, in 2011 Mikhail Gorbechev in his book titled 'Mikhail Gorbechev: The Prophet for Change' spoke about the report of the 'Sovereignty Panel' that he helped draft, stating that while the recommendations in the report were welcomed; it is yet to be implemented. "I am saying this 9 years after the report. And this is quite typical. The reason is a deficit of political leadership. If this continues, tomorrow will be too late to address these problems."

The past efforts have failed because they were driven by water related institutions attempting peace. A successful effort in the future will only succeed if it is driven by political and security actors in cooperation with water institutions. Therefore, peace and security have to be at the core with water linked to it and not the other way round.

Every time there is a deadlock, it is only solved at the political level. In recent years this has been the case between Egypt-Ethiopia and Iraq-Turkey. Hydro-diplomacy will need to be about diplomacy first and hydro later.

B. Need for a Facilitation Centre

Transboundary water cooperation is a complex issue where disagreements and disputes are common place. While some nations manage to resolve their differences and cooperate, others for

reasons that will be discussed below find it harder to achieve a peaceful resolution of their grievances against each other. The reasons are as follows:

- Transboundary water management is often perceived by states to be best done within the realm of administrative or territorial divisions and not on hydrological lines.
- Consensus building between nations over transboundary water requires concerted efforts.
- The idea of sovereignty over natural resources, including transboundary water varies from state to state. While some tend to consider it an absolute right others tend to afford flexibility.
- States often have varying interests when it comes to the use and exploitation of their natural resources-socio economic development being paramount in most cases. Drawing a balance between these interests obfuscates the process of cooperation.
- Cooperation is usually narrowly focused on surface water alone. Ground water which provides further avenues for cooperation is ignored.
- Matters of national security are often quoted as yet another obstacle to cooperation where states find it hard to cooperate even at a technical level by exchanging data.
- Historical differences, high levels of distrust and internal political instability can also hinder cooperation.
- Environmental issues such as climate change, drought and other such factors exacerbate tensions between nations over transboundary water sharing.

There is thus a need felt to have a global initiative in the form of a Hydro-Diplomacy Facilitation Centre to help countries address their points of differences and move towards cooperation. The Centre will serve as a neutral mechanism to help anticipate, prevent and resolve low threshold disputes. Low threshold disputes in essence are those stages of disputes between nations when there are 'turning or opportunity points' for parties to take effective action towards cooperation and peace. Section 3.1 below delves deeper into the definition of a low threshold dispute. The Centre would help in building consensus between riparian nations. Any action of the Centre will be contingent upon the consent of the state parties. The Centre will most importantly be a body that uses diplomatic tools to resolve issues between nations on freshwater resources.

C. Characteristics of the Center

1. *Serve as a neutral mechanism*

   The Hydro- Diplomacy Facilitation Centre will serve as an entity that has the credibility to ensure that the participants are provided with an environment which is unbiased and suited for deliberations. The Centre would create (or serves as) an atmosphere of trust and fairness. It will maintain a level playing field for all parties and ensure that states have an equal say in the process. The Centre will however operate at every stage with the consent of the parties and it will not serve as an advocate for anyone on substantive or procedural issues. Lastly, the Center will maintain confidentiality.

2. *A specialist international forum for matters relating to transboundary fresh waters and riparian relations*

   As mentioned previously, there is a need felt for an institutional set up that will promote political action and prevent conflicts or disputes relating to freshwater resources. This is because, while there are a plethora of UN and international bodies focused on various aspects of freshwater resources, a highly specialised body at a global level which is focused on riparian relations on fresh water and the prevention of disputes is still needed. The Centre will be an effort to bridge this gap that exists such that countries globally have stronger relations and cooperation.

3. *Facilitate the resolution of low threshold disputes.*

   3.1 Defining low threshold disputes

   A dispute is more than a general attitude of dislike or hostility. It is not a situation where a nation feels a sense of injury or grievance towards another. A dispute only arises when this sense of injury is manifested in a claim and is denied by the other. A dispute is defined as "a disagreement on a point of law or fact, a conflict of legal views or of interests between two parties."

   The elements of a dispute are as follows:

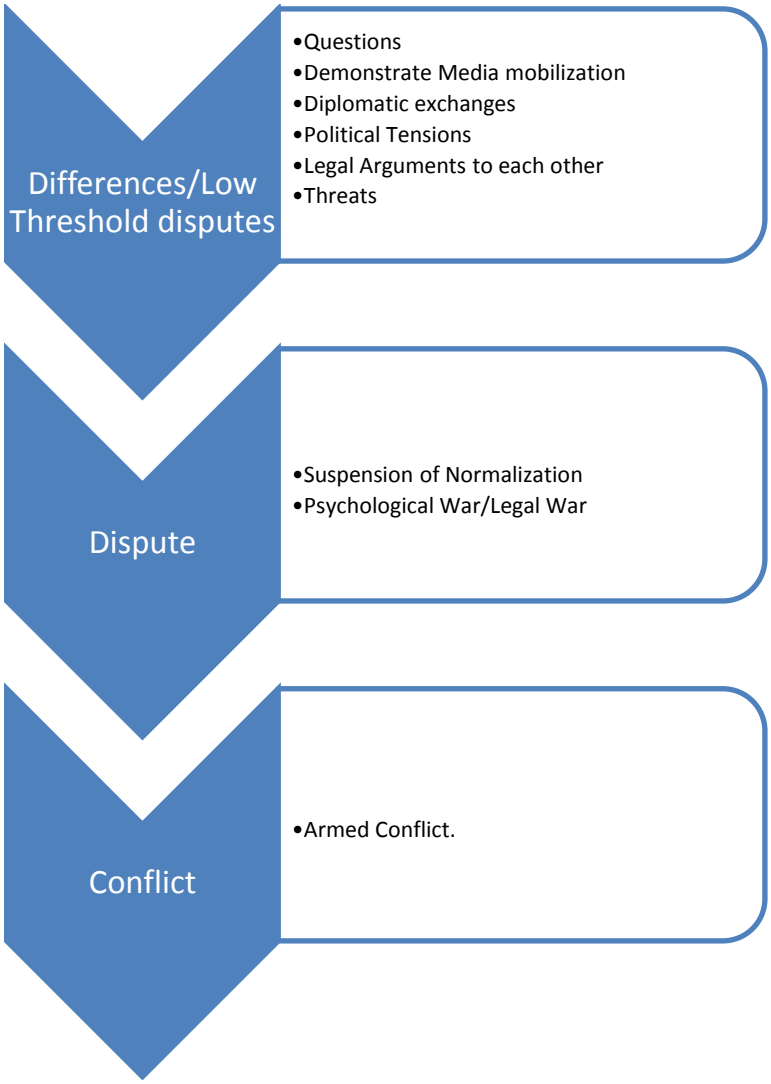
- *It is specific:* The dispute is regarding a definite subject matter
- *have conflicting claims and assertions:* Only when one party asserts a particular claim and the other denies this claim, a dispute is said to manifest. This assertion and refusal of claims between parties could be through the issuance of statements, exchange of diplomatic notes or other specific actions.

   However, the Facilitation Centre is to look into low intensity/low threshold disputes i.e a situation where there is disagreement and not situations where the disagreement has such intensity which is bound to threaten the relations between the two nations. The low intensity disputes could be in the form of complaints, grievances and other disagreements. It is a complex task in determining what constitutes a low threshold dispute. The Indus Water Treaty for example has attempted to distinguish the various phases of dispute. It lays down three stages -'Questions, differences and disputes' and various forms of resolution mechanism for each of the stages so that the dispute is resolved amicably. However, even here these three stages have not been defined except that it is in ascending order of intensity.

   Further an existence of a dispute also denotes a stage where methods of dispute settlement techniques such as coercive mediation, arbitration, adjudication may be needed and employed. If the matter is not settled at this stage it has the potential to turn into an armed conflict.

   The list below shed some light on the stages of dispute i.e stages between Peace and Armed Conflict. The Low Threshold disputes would predominantly be from points 2-7.

1. Peace
2. Questions
3. Media mobilization
4. Diplomatic exchanges
5. Political Tensions
6. Legal Arguments to each other
7. Threats
8. Suspension of Normalization
9. Psychological War/Legal War
10. Armed Conflict.



3.2 Facilitation mechanisms to resolve the low threshold disputes

The Hydro-Diplomacy facilitation Centre may deploy the mechanisms given below to help parties resolve their differences. The mechanisms are not given in its order of deployment. The Centre will have to determine based on the kind of dispute and the requirements of the parties what mechanism would be most suited to the parties.

a. Fact Finding

When a situation arises where there is an impasse in talks that would have led to cooperation between the parties, due to limited or conflicting data or any situation where a more nuanced discovery and/or exchange of information is required, this mechanism could be deployed. The initiation of a fact finding mission usually occurs with an agreement for the same by the concerned parties.

The process:

- Fact finders: a roster of neutral experts could be prepared for the parties to choose from.
- A schedule for completing the fact finding mission, rules of procedure for conducting fact finding missions need to be prepared and agreed upon by the parties.
- Access to relevant information, sites and people should be given by the parties.
- Confidentiality of the process needs to be guaranteed by the facilitation centre.
- Once the fact finding is complete, a report will be submitted.

Based on the report submitted by the fact finders, the Centre can help parties to come to a decision and cooperate.

b. Helping parties to recognise and agree upon potential trade-offs

The Facilitation Centre can help parties to identify specific bargaining chips which will help them cooperate on water. This would be a barter system of sorts where one party agrees to cooperate on water in return for a specific favour from the other party. This is considered to be win-win situation where both parties get what they need or want.

Given below is a list of such options for trade-off. The list is not exhaustive.

- Help in securing borders in exchange for water sharing
- Help in any other security challenges in exchange for water sharing
- Financial aid in exchange for water sharing
- Energy in exchange for water
- Aiding Infrastructural development in exchange for water
- Cross linking rivers: One party agrees to cooperate on water sharing of a river where it is an upper riparian in exchange of the other party's cooperation on water sharing for a river where it(second party) is a upper riparian.
- Support for membership to a regional or global body in exchange for water.

c. Conciliation

Conciliation is a process which aims at building positive relations between states. It involves a third party like the Hydro-Diplomacy Facilitation Centre having the trust of the parties, examining all aspects of the disagreement between the parties. The conciliator submits their report suggesting settlement measures to the parties. It is a process that involves fact finding and third party facilitated negotiation. However, the major difference between conciliation and mediation is that the recommendations of a conciliator are not binding. The reports are only proposals and do not constitute binding decisions. The parties have the option of entering into an agreement later to make the recommendation binding. Also unlike mediation, Conciliation is seen as a preventative measure where a conciliator pushes for a settlement before the dispute or misunderstanding becomes a substantial conflict.

The recommendations provided by the conciliator would be creative and such that the parties would want to adopt them. For example, the conciliator may suggest widening the scope of water cooperation i) From rivulets to entire basin ii) from smaller projects (irrigation etc.) to water sharing. Also construction of infrastructure over the river often causes tensions between states. Specific cost and benefit sharing formula developed and implemented in basins such as the Senegal may help resolve such issues.

3.3 Facilitation processes vis-a-vis adjudication or intrusive processes.

It is to be noted that mediation, arbitration and judicial processes are used by parties when there is a dispute of a higher level. The Facilitation Centre will be useful in preventing such disputes. The Facilitation Centre will serve as a non-adversarial, non-confrontational mechanism which will have an advisory role**.** This will be different from other traditional mechanism of dispute resolution such as mediation or judicial/adversarial process which is often considered to be intrusive.

Mediation at an international level poses several problems as it is often considered coercive. Arbitration or judicial processes on the other hand takes up more time and resources and the result may not be a solution which may be perceived as a win-win. Also a forum like the International Court of Justice (ICJ) is often considered to be inept in dealing with transboundary water disputes. For example, the ICJ was reluctant to use provisional measures which are a form of injunctive relief to suspend Uruguay's construction of pulp mills which was causing transboundary water pollution. Such reluctance may cause irreparable harm to riparian states. Ensuring that the parties abide by provisional measures of the ICJ is a hurdle too.

This is not to say that the Centre cannot look into more traditional processes of dispute resolution such as mediation or arbitration. The Centre could have the efficacy to provide for the resolution of contentious issues if the states deem fit.

Nevertheless, it would be pertinent to note that there are several existing mechanisms for dispute resolution including the Permanent Court of Arbitration (PCA) in The Hague which *inter alia* has a

panel of environment experts, who can be chosen by the states to act as arbitrators, conciliators and even expert witness. Riparian nations with water disputes have utilised PCA in the past. Given the various mechanisms for water disputes, the Centre must showcase certain uniqueness in dispute resolution that will help countries want to choose the Centre over other bodies. For example the International Court of Arbitration of the International Chamber of Commerce which was established in 1923 to resolve commercial disputes is a body that is preferred over other similar bodies in the world. One of the reasons is their unique three step review process of arbitral awards which ensures that the quality of the awards is at its best.

3.4 Other mechanisms similar to the Hydro-Diplomacy Facilitation Center

The Implementation Committee under the UNECE Water Convention was established at the sixth session of the Meeting of the Parties to the Convention in Rome on 28-30 November 2012, in order to ensure implementation and compliance to the Convention. The objective of the mechanism is to "facilitate, promote and safeguard the implementation and application and compliance with the Water Convention." The Implementation Committee consists of nine members, who serve in their personal capacity. The Committee has been bestowed with certain dispute prevention and resolution powers. A party having a grievance against another state under the Convention may approach the Committee. The Committee then submits reports and suggestions to the Meeting of State Parties to the Convention based on which the state parties can pass a resolution to suspend the state which is not complying with the provisions of the Convention. While a non-state party to the UNECE water Convention can approach this body, however it can only be with reference to the Convention. A non-state party cannot bring issues which are outside the scope of the Convention to this body. A Facilitation Centre on the other hand would have a much wider ambit in this regard and a party may not be compelled to adhere to a particular Convention.

The World Water Council which recognises the importance of hydro-diplomacy has a much larger mandate for water. Hence, the particular aspect of fostering cooperation on fresh water and the resolution of low threshold disputes are neither addressed nor prioritised.

4. *Facilitating the development of early warning Mechanisms/Develop early warning mechanisms.*

As mentioned previously, a dispute comprises of a sequence of phases. Within each phase there are factors that generate pressures, which encourage or discourage the occurrence of an armed conflict or suspension of normalization between states. Each stage has factors that may push the dispute across thresholds toward or away from an armed conflict. Hence developing early warning mechanisms that would help address issues the moment they emerge would be pertinent because it presents greater opportunities to look forward in the direction of cooperation rather than responding to issues after they have developed to a less manageable scale. Also, it would be logical to assume that actions taken at the lowest and insipient stages or phases of dispute would have better impact as opposed to actions taken at the higher stages of dispute.

An early warning mechanism is the collection, integration and analysis of data which can be developed into a comprehensive early warning report and strategies to identify stages of disputes and prevent its escalation. If the mechanism concludes that there is a possibility of a conflict then the relevant decision makers are sent the analysis with the request to take measures to prevent the same.

The development of future scenarios is an effective means to sensitise decision makers to changing realities, encourage them to respond appropriately and at a faster pace.

The Hydro-Diplomacy Facilitation Centre may either with the help of its resident experts develop such early warning mechanisms or depend on the mechanism developed by other organizations and encourage states to take measures accordingly. Although it must be noted that there have been very few identifiable early warning mechanisms developed so far for water related disputes or conflict. The international community is increasingly recognising the importance of such early warning mechanisms, for example: The United Nations Regional Centre for Preventive Diplomacy for Central Asia (UNRCCA) programme of action for 2012-2014 called for the development of an early warning system focusing on water management, taking into account the interests of all the riparian nations involved. Nevertheless, the mechanisms at present mostly deal with determining the escalation of a situation into a full-fledged armed conflict. Further, there is a possibility that the states may find this intrusive due to the fact that the domestic situation in a country is being monitored. However, the nature of early warning mechanisms is often as such that it only utilises data in the public domain. The states will have complete autonomy to either accept or denounce the findings.

A similar such exercise is carried out by the Environment and Security Initiative (ENVSEC). It assesses the situation on the ground through mapping exercises which takes into account the environment and security risks. It then identifies environment and security 'hotspots'. ENVESEC has developed cartographic tools that provide a graphic representation of these security hotspots. They use these tools to engage with various stakeholders including decision makers.

5. *Mobilising the support of the International Community*

   The Facilitation Centre will have the efficacy to bring political weight thus creating an enabling environment for states to enter into cooperative arrangements. When states involve the Facilitation Centre to resolve their differences, they get the advantage of receiving the support of the international community at every stage. This may help in several ways including help in securing funds. With the help of the facilitation centre, global and regional responses to critical emerging issues in the water can be coordinated in a timely and efficient manner.

6. *Provide broad recommendations for cooperation and peace*

   The Facilitation Centre may provide recommendations to states. These recommendations will not be of any binding value. However, they will serve the purpose of clarifying several issues that may prevent parties from cooperation. Also, the Facilitation Centre may recommend expanding the process of cooperation from water to other matters. Clarifications on subject matters as such as state sovereignty over its natural resources can also be provided by the Centre. The recommendations could be technical, legal or political.

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