Fresh Water and Developing Countries: Regulated international trade practices and collaborative reflective policies needed to ensure sustainable development

Doaa Khalil

University of Warwick

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Aimed at The United Nations Environmental programme (UN Environment).
This is due to the leading authority it has in the global environmental agenda as well as its position in the UN to which will provide the mechanisms to not only be an authoritative advocate but reach expertise in variety of fields which is needed to combat the issue of water scarcity.

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EXECUTIVE SUMMARY

Global fresh water has become a scarce source as a result of how humanity has managed it – making it one of the planetary boundaries. It is important to acknowledge the consequences of human's actions on specifically the Agricultural sector as it's a vital component to developing countries' economic growth. Human's activities in agriculture has led to the decline of water needed to maintain ecosystem's functions. This is detrimental in terms of the water-stress that can occur which can lead to internal conflict that can also hinder the development of countries. It is imperative to investigate the issue of water scarcity more thoroughly as it is interlinked with other planetary boundaries such as Biodiversity loss which harms earth's ecosystems and thus human beings. This is particularly harmful to developing countries since they do not have the technologies that developed countries have to withstand such issues. However, these technologies can also be harmful to the environment and growth of developing countries thus should not be perceived as an appropriate method of tackling the issue. Developed countries also contribute to the hinderance of the development of developing countries through the international trade of 'virtual-water' to which uneven power can be prevalent. This prevents developing countries to exploit their full potential as they carry the costs after transaction. Consequently, policies need to be made to preserve natural ecosystems through protection and restoration to which can be funded by ensuring just 'virtual water' trade practices are practiced. However, additionally there is the need to take a collaborative approach with different fields of expertise as water scarcity can be influenced by many other seemingly unrelated policies. Consequently, this would ensure a more cohesive approach tackling the issue at every angle.

FOUNDATIONAL SCIENCE: DISCUSSION & ANALYSIS

'Global Fresh water use' is a planetary boundary (1) to which refers to the safe operating limit to which humanity can function without compromising the essential earth systems. In relation to developing countries, it is imperative to cast more attention to the issues of freshwater sustainability. This is due to the high reliance on agriculture which can lead to cascading effects such as the hindrance of water availability (2) to which can heavily influence their economic and social development (22). With agriculture counting to around 70% of the earth's water consumption it is essential to find measures to use water more efficiently (23 – p4832).

This is primarily an issue for developing countries as they are economically developing in order to escape poverty (9). Due to being developing countries, agriculture is the most important factor of economic growth since it reduces poverty and provides a large percentage of employment (5).

However, the water irrigation leads to the decline of water availability for the earth's ecosystems to function (8) In addition to that, as with high levels of agriculture result to increased biodiversity loss as shown in Figure 1 (10) it is imperative to acknowledge the cascade effect of Agricultural activity as it can also be the main source of water-stress that can lead to social implications such as civil unrest that can harm the development of developing countries (16).

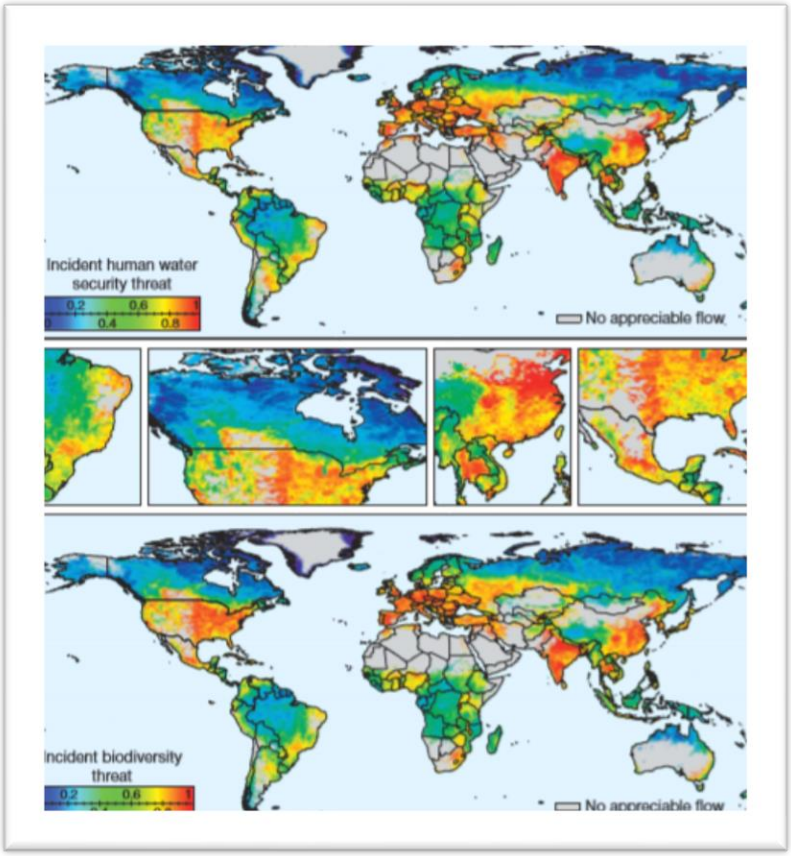

Figure 1: The map demonstrates the similarity to where high security threats of water security are in relation to areas of high biodiversity threats (10).

Having Biodiversity loss is also a planetary boundary (1) highlights the urgency of freshwater management as it interlinks with many other urgent issues. With increased biodiversity loss we are limiting the variability of all living organisms as well as limit the diversity between and within species and of ecosystems (11). This reduces the capability of developing countries to protect themselves from ecological surprises as biodiversity helps maintain the ecosystems that maintains humans' well-being (2). This is particularly true in the case of developing countries as they do not have the technologies that developed countries have to help withstand these threats (7). However, this is not to say that these technologies should be implemented in developing countries as they can also be part of the problem by not solving the root of freshwater issues (7). The issues that arise from the poor water management can be seen today with the failure of multimillion-dollar projects (3) and how 80% of the world's population is at risk of water security (7 – p4).

Additionally, there is also the dynamic of international trade that needs to be reviewed. Developed countries are prevailing issues of water scarcity for developing countries through means of international trade of agricultural commodities to which are referred to as 'virtual water' (12). This is particularly visible in terms of trade with Africa where regardless of its water scarcity is still a net exporter to other continents including the developed continent of Europe (12). Therefore, the issue

of water management is prevalent here as the efficiency of this kind of case is visibly unsustainable. This is due to it being of the trade of products based on demand to which generally has no positive relation to actual availability (13). In addition to that, with only 1% of the earth's water accessible and sanitary to the earth (10 – p1) there is the necessity for equitable allocation of water. However, this is not the case with water distributed very unevenly across the planet (10). The developing countries are most likely to suffer from water scarcity, leading to substantial environmental degradation to which they do not have the capability to fix (24).

ASSESSMENT OF EXISTING GOVERNANCE

- International Trade: This is in relation to the targets provided by the UN to reach Goal 6 – Clean water Sanitation (14). It is plausible to suggest that water-scarce countries should import food grown in water-rich countries (14). This is important in terms of acknowledging the 'virtual-water' market and how it can affect food security and the poverty levels of developing countries (17). However, there is a lack of concrete action in order to ensure that this occurs or is even plausible considering the nature of the market. This is due to how demand can influence the distribution of water with developed countries having larger inefficient levels of demand (10). Governments of developed countries can take increased protectionist measures to reduce their levels of water scarcity (18) making it more difficult to import for developing countries.
- Restoring Eco-systems: Target 6.6 (19) provides measures that fall in line with the issue discussed above of how the use of technologies are damaging ecosystems (7). The aim of restoring nature in terms of wetlands and etc. will help increase the biodiversity as well as water availability for developing countries (19).
- Water-stress: The discussion around the topic of water-stress in the Synthesis Report on Water and Sanitation (14) did not provide substantial information in terms of the social impact of water-stress. Consequently, it does not acknowledge the social instability that can occur as the result of it (16) and thus deems to overlook resolving the civil complications that may occur as a result of the policy proposed (14). It is interesting however the approach taken in the Progress on Level of Water Stress Report in terms of using the methodology developed by GEMI (19). The pilot study has allowed significant reflection of the reality of obtaining precise information. Thus, this is a great stride towards making more policies that accurately reflect reality in the future. The study has improved institution relations and strengthen networks of professionals which will help improve the monitoring of progress against the target (19, 14). This helps develop more efficient and cohesive policies as there is more insight on the issues faced.
- Collective of professionals input: The policies presented had substantial amount validity in terms of having data provided by multiple institutions to which are specialized (14, 16). Therefore, the research has been able to identify more areas of difficulty and improvement for water sustainability and thus provide more applicable and plausible policies (20).

GOVERNANCE RECOMMENDATIONS

- There is the need of increasing the protection and restoration of wetlands, floodplains and other natural resources as shown in Figure 2 (10) in order to experience long term benefits of all social, economic aspects and biodiversity. Through such means developing countries become more efficient due to the availability of clean water. This also decreases the anthropogenic pollution that can be caused by highly managed ecosystems (7).

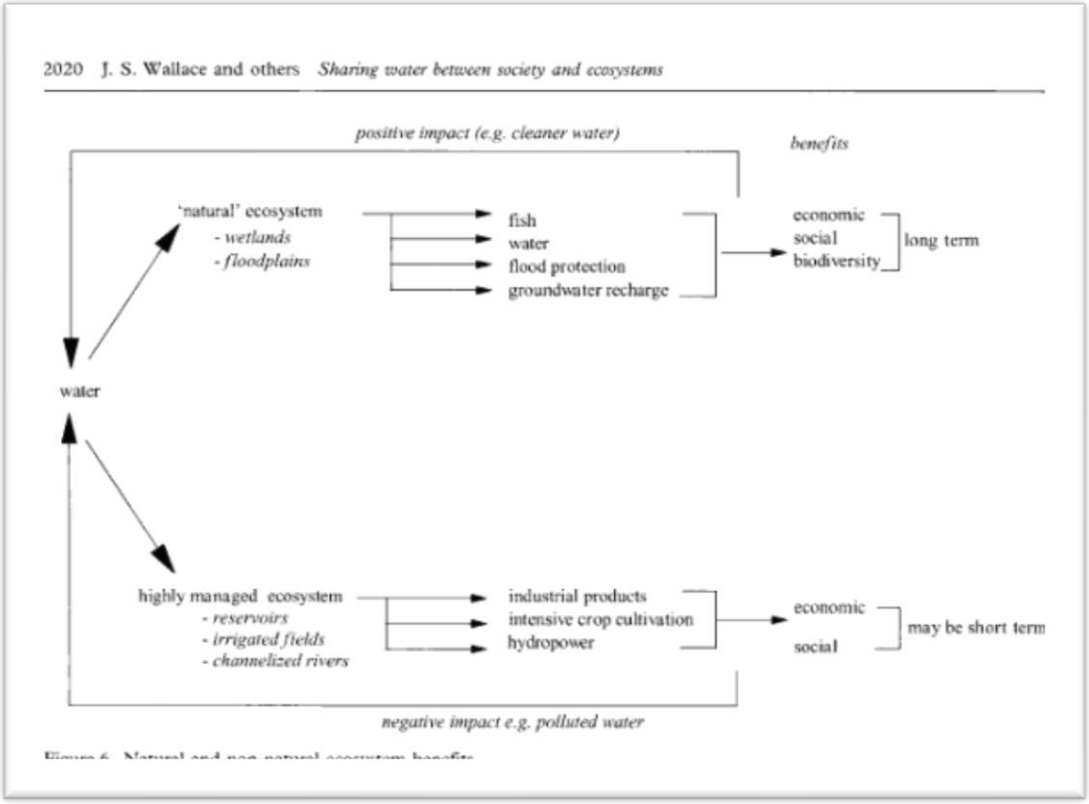

Figure 2, (10) shows the consequences of handling ecosystems in a way without being highly managed and naturally

However, this could be considered a policy to which would take time to implement. Therefore, it would be plausible, in the short term, to propose measures such as Rain Water Harvesting as seen successfully working in the U.S during stormy seasons (25) to developing countries that experience extensive rain. As for countries with a drier climate, investing in producing crops with increased productivity through means of enhancing genetics so they can withstand the lack of/unsanitary water which would provide the capability for developing countries to sustain themselves during drought hazards (24). This would increase the efficiency of developing countries which would expand trading opportunities and thus development rates. However, there is the additional issue of funding the research and implementation for these policies to which is proposed to be overcome through ensuring just and efficient international trade of virtual-water.

- International ‘virtual-water’ trade: As discussed earlier on in the brief, the developing world in terms of exporting virtual water by means of food is reducing the already scarce water availability (12). Understandably this is due to the water-stress developing countries are likely to be under and thus need for income from exports to sustain a living. However, there should be in place adequate monitoring of just prices. It is essential to hold the purchasing countries accountable for the trade of virtual water as it can provide the funds needed for developing countries to invest into sustainable water practices. Since the consumer is whom benefits due to the under-pricing perception of water, the costs consequently remain on the developing county’s side (12) to which could have been used to benefit their own civilians. Thus, there must be regulation of such practices developed. However, there is also the need of strong relations between the developing countries and the developed. This is due the likelihood of disequilibrium in power and thus not lead to just agreements. Consequently, this highlights for policies to step in as the middle ground to ensure no injustice is to occur.
- There is also the need for significant more research to be done in terms of obtaining knowledge on developing countries as well as methods that are mostly suited. A prominent example of an inefficient attempt to help with water sustainability in developing countries is in Africa where there were more than 60,000 new handpumps being constructed every year (4). However, a 2007 study across 21 countries in sub-Saharan Africa found that 36% of the hand pumps were not functional. This led to a large economic loss, between US$1.2 and 1.5 billion in investments (4).

This is an example of how the lack of substantial knowledge and research can lead to detrimental impacts on the economy. In particular in one of a developing country.

Therefore, there should also be the widening collaboration of professionals from different fields of expertise as it has been discussed the different influences water scarcity can have and delicacy it can have to anthropogenic activity. It has been realised how policies unrelated to water management can affect water availability - enough to the extent of having more impact than agricultural and water management practices (17). The issues lie in how those in positions of decision making can be prone to not realising the affect they can have on water sustainability. Conclusively, there is the need to ensure pressure for more communication between fields for the better understanding of humanity’s detrimental capabilities on water availability (17, 7). This would help ensure just, reflective and efficient practices are in place to prompt the development of developing countries and the sustainability of our water.

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