Introduction

Excellencies I am honored to be here. Dr Han I wish to thank you personally for your persistence efforts over the last many years to keep this vital issue in front of the world.

Ladies and Gentlemen: To a large extent, disasters and relief are now globalized phenomena, and we need to rethink how to cooperate in prevention as well as reaction.

Today I will offer a reflection on a key public policy ethical issue behind our discussion; a short analytical reflection on resilience, and; 8 lesson/recommendations on what we might do in the coming UN decade of water.

An Ethical Public Policy Issue

We may be raising fears and anxieties over impacts of projected changes in climate while inadvertently denying means to cope with these impacts.

The major reasons repeatedly used in talking points of international officials, for why we should deal with climate change are potential water related events and their projected social impacts. They primarily are social impacts of; frequency and intensity of droughts and floods; sea level rise; water access and scarcity; water quality and health; increased frequency of torrential rain; intensification of typhoons/hurricanes, and; others. At the same time as we focus the world’s efforts on mitigation and spend little on adaption we may inadvertently be denying adaptive means to cope with these projected impact events; events we know will occur. This raises an important ethical public policy issue. This importance is now born out through Paris accords: where recent French studies show that 90% of IDN’s are actually water investments.
An analytical reflection on Resilience

We know that managing risk and the uncertainties of the extreme events of floods, tsunamis and droughts is critical to achieving social stability, breaking fatalism, and facilitating growth and social transformation. Rich countries direct water investments to keep damages as % of GDP to 5% or less. Poor countries lack means to manage uncertainties/risk and GDP fluctuates with rainfall resulting in damages greater than 40% of GDP. AID often becomes primarily humanitarian helping the poor back to ex ante situations; often simple sustaining subsistence living rather imparting tools to escape this horror.

One hundred years of U.S. data, post war Japanese data and modern Chinese data show that while damages may increase investment in water infrastructure to deal with variability has resulted in decreased damages as percentage of GDP to steadily decline. As the index of damages as percentage
of GDP lowers it also is an indicator of increased resilience; resilience to allow the social systems to continue functioning even under the stress of large scale natural events.

We might ponder: do the rich countries have high resiliency because they are rich or did they become rich because they invested in resilience measures?

![Figure 14](image)

![Figure 15](image)

12 Recommendations/lessons learned from recent mega-disasters

1) Within the next generation, more than 70% of the global population will be living in vulnerable coastal areas and the large floodplains of numerous rivers. At the same time there is growing rich-poor gap of who realizes reimbursements for disaster losses. We must better plan for prevention in the growing mega-cities around the globe and not just view them in terms of humanitarian post-disaster responses alone. Mega-cities will require more infrastructure investment to protect against such events, together with more restrictive land-use controls and zoning to avoid increases in damages.

![Megacities 2007](image)

![The costliest floods in the 21st century](image)
2) Because people bear the risks, their participation in the tough operational decisions made during the process of planning for mitigation of potential events is critical to the health of accountable political systems. But this is not easy; leaders are awakened during disasters but quickly forget once disasters subside.

3) Residual risk is almost always underestimated and poorly understood: we need to find better methods.

4) Rather than being defined purely by engineering solutions, we now understand that all stakeholders contribute to risk reduction through a variety of structural and non-structural measures.

5) **Multiple and integrated defenses around cities are critical.** This means creating packages of natural and human processes such as evacuation routes, elevated and flood-proofed buildings, pumping stations, levees, flood gates, highways, natural ridges, wetland nourishment, barrier islands, outer shelf activities and compartmentalization of polder areas.

6) Relief, response and prevention must be integrated in a system of risk management, where citizens actively participate and countries need to mobilize before disasters strikes to reduce risks.

7) Countries and mega cities need benefit cost analysis (BCA) of disaster risk reductions (DRR) investments in mega cities which are becoming increasingly vulnerable.

8) Countries need to prioritize and build systems to forecast, inform, alert and evacuate.

9) Countries and donors should incorporate disaster risk reduction and climate change adaptation as integral to development planning.

10) Safe water and sanitation must be provided quickly when disaster/conflict strikes as part of humanitarian.

12) Hydro-climatic data needs to be seen as public goods to be shared at all levels (regional, national).

**Final Thoughts**

The Global Water Partnership (GWP) TEC, which I chair, continues to actively pursue this issue. Let me mention 3 products currently being develop.

1. A background paper and workshops on tools for Collaborative modeling (CM). Through hardware and soft advances along with participatory stakeholder planning, CM tools now facilitate “real time” integration and participation of stakeholders in the actual technical modeling and algorithms to be used that support eventual trade-off decisions.

2. A perspective paper and case studies on BCA of DRR in mega cities worldwide.

3. A perspective paper that asks the question: can new forms of risk pooled insurance (reinsurance) help development processes in poor countries – a dialog among insurance experts and water resources experts.

We at GWP and GWP TEC welcome the participation of any new knowledge partners in such endeavors. Thank you for your attention.