

ROSENBERG INTERNATIONAL FORUM  
ON WATER POLICY

Findings of the 9<sup>th</sup> Forum Held in Panama City, Panama on January 24-28, 2016

SUMMARY

1. Patterns of water scarcity differ in humid and arid regions, but the differences are a matter of degree. Effective institutions of governance to manage scarcity are crucially important. Differences in these institutions invariably determine how well water scarcity is managed.
2. The lack of effective governance often results in negative water-related and other environmental impacts that differentially effect the poor and vulnerable.
3. The importance of biodiversity and water-related ecosystem services is frequently overlooked and ignored at great cost.
4. The predictive science of hydroclimate change is evolving, though it now appears the evidence of increased frequency of extreme events is quite persuasive.
5. The primacy of economics will always be important but not at the expense of the community/public benefits and values.
6. People matter. It is extremely important to recognize political, ecological, cultural and economic patterns.
7. Timely provision of scientific information is critical. To the extent possible, decisions should be based on available scientific knowledge. Such knowledge should be continually expanded through additional research with special emphasis accorded to multi-disciplinary science which captures basic, biological and social interactions that are frequently neglected. The value of indigenous knowledge should not be overlooked.
8. Human capacity building and public education together with broad public involvement are essential for solving water management problems in humid areas.
9. Groundwater in humid areas is frequently overlooked because of the abundance of surface supplies. However, groundwater can buffer and augment basic water supplies during drought. The availability of groundwater in humid regions should be thoroughly assayed and management institutions developed to ensure these waters are used sustainably.

## Rosenberg Forum Recommendations

### Regarding

### Panama Planning for El Nino

### Dry Year Resiliency

Participants in the Rosenberg appreciated the opportunity to engage with Vice Environmental Minister Emilio Sempris, Secretary Jorge Motta, SENACYT and Carlos Vargas, Executive Vice President for Environment, Water and Energy, Panama Canal Authority. The Participants appreciate that there is currently a robust discussion about long-term planning to provide resiliency in Panama's water resources system. The planning focuses on developing reliable supplies for a variety of uses, including, but limited to, canal operations, domestic potable water supplies, agricultural operations and ecosystems services. The Participants understand that the planning is designed to address El Nino (dry year) conditions in particular.

Based upon the information presented to the Forum, the Participants suggest that the following actions be evaluated for their potential to firm up El Nino year supplies:

- Invest in improved domestic water supply delivery systems to reduce current losses in the existing in the systems.
- Examine alternative domestic water supply pricing policies and the impact of such policies upon demand;
- Explore conjunctive management of surface and groundwater supplies as a means of making groundwater supplies available in El Nino conditions to meet irrigation and domestic demand;
- Examine possibilities for recycling Canal Water and locating Panama City diversions from the canal waterway as low on the system as possible thereby reducing the impact of canal operations on water supplies for other uses;
- Examine the potential of wastewater reclamation to provide additional supplies to meet existing and future demands.

All of these potential actions should be evaluated in a manner that provides comparative incremental cost estimates and social impact analysis.

These suggestions are offered as additions to the considerable programs of research and evaluation currently underway.