

world water

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Seychelles' integrated water strategy

Securing its water future

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Seychelles invests in future water security

The Government of Seychelles is driving forward on an integrated water resources management strategy that relies on energy efficiency, demand management, and developing alternative supply sources from rainwater harvesting and water reuse. **Evan Dollar** of MWH, now part of Stantec, outlines some of the innovative work underway to help secure the island's water future.

Seychelles, a small island nation in the Indian Ocean, recognizes the importance of investing in its water future. The developing nation is facing increasing pressure on its limited water resources due to many factors including a growing population, demographic change, increasing wealth, and the impacts of climate change. An unfavorable topography and limited opportunities for traditional storage solutions add to the challenges, as does the fact that only 20 percent of the Seychelles population is connected to the centralized sewerage system. In effect, discharge from septic tanks and other sources of pollution presents a potential threat to human health, water resources, and water security.

These factors have driven this island state to focus on alternative sources of water, water

demand management, efficiency, and better information and monitoring. Additionally, Seychelles is promoting enhanced and participatory water governance at a catchment-level. Indeed, the Government of Seychelles, recognizing the unity of the water cycle and hence the need for a systems approach, recently adopted an integrated water resources management approach. MWH, now part of Stantec, has been part of this planning, with a clear focus on building solutions with the Seychellois community in mind. Planned investment spans the water cycle and focuses on sustainable communities, capacity development, efficiency, resilience, stakeholder participation, and environmental compliance and enhancement.

Adopted in July 2017, the National Water Policy and National Integrated Water Resource

Management (IWRM) Plan endorses this approach. Together, these plans provide the basis for sustainable, equitable, and coordinated development. They will also support the cross-sectoral management of water, land, coastal, and estuarine environments that impact the ocean and related resources in this island state. These policies will be followed by the development of new legislative and regulatory frameworks to secure Seychelles' water future.

Resource efficiency

MWH recently implemented the resource efficiency program for the Seychelles water sector (REPSWS). This program (2014-2016), supported by the European Union (EU), was an accompanying measure to a major water and wastewater investment program funded by the



City of Victoria on the Seychelles' main island of Mahé. Photo by MWH, now part of Stantec



A preferred strategy has now been created that focuses on maximizing access to sanitation services and on innovation and sustainability through the reuse of treated sewage effluent.

Left: View of the Mare aux Cochone River barrage near Port Launay, Mahée, Seychelles. Photo by MWH, now part of Stantec

European Investment Bank (EIB) and Agence Française de Développement, working with the Seychelles Public Utilities Corporation (PUC). It addressed three key challenges in the Seychelles water sector:

- Enhancing energy efficiency across Seychelles' water supply systems
- Future water demands and water security
- Developing water supply measures for the main islands to 2030.

For the energy efficiency component, an energy audit was undertaken and followed by more focused investigations. Recommendations included more energy efficient assets, load balancing, and in-line turbines generating renewable energy. More general recommendations were also presented to enhance operational efficiency and maintenance across wet infrastructure.

In the case of the water demand management (WDM) component, REPSWS designed a national awareness campaign, which focused on four key messages:

- The real value / true cost of water
- Every drop counts
- Every little effort counts
- It starts with you.

The WDM component also developed water demand projections to 2030 for the three main islands of Mahé, Praslin, and La Digue. Costs and benefits of implementing water demand measures across these three islands and their potential efficacy in reducing consumption were calculated. Seychelles is now considering initiating island-wide rainwater harvesting technology and supporting it with relevant guidance and regulations.

The third component, on drought risk mitigation, included the implementation of the first integrated water resources modeling across the three main islands. This process enabled the development of supply-demand balances to 2030 and the exploration of a range of supply-side measures to address identified deficits. Locations and specifications for new hydrometric stations to enhance the evidence base for water security decision-making were completed.

Key lessons

Across each of the REPSWS components, several key lessons were learned, and strong recommendations also emerged including:

- There are many benefits to be gained from investing in data collection and management to support improved evidence-based decision-making.
- The promotion of interagency cooperation supports appropriate institutional development, delivers multiple benefits, improves efficiency, reduces costs, and enhances outcomes for people and the environment.
- Active collaboration with concurrent donor-funded projects helps to promote synergies and lesson learning across projects while reducing the risk of duplication of effort.
- There is significant value in engaging with regional / global bodies and initiatives to share experience and support technical capacity development.
- It is important to look at the development of future capacity in the water sector and support university courses through direct teaching and in-kind projects.

MWH is now helping deliver an integrated, comprehensive sanitation master plan for Seychelles. This plan has assessed existing sanitation conditions and challenges in the country and has developed a cost-effective outline design to improve the sanitation systems of the islands. Various strategies and technologies were assessed for suitability, environmental impact, and financial and economic viability. A preferred strategy has now been created for the 10-year master plan (2020-2030) that focuses on maximizing access to sanitation services and on innovation and sustainability through the reuse of treated sewage effluent (TSE) for irrigation and biosolids suitable for land application.

Reuse will help drive circular economy

As part of the Seychelles vision for a circular economy, reuse of TSE and biosolids can make a significant contribution to well-being, resilience, and sustainable development. While the existing production of, and demand for, reuse products is low, there is both the appetite and a strong business case for their development. A recent assessment of the market by MWH suggests that

all TSE could be used within the islands for agricultural irrigation, landscaping, and industrial applications. With the right infrastructure and treatment in place, biosolids could be used to generate renewable energy for domestic use or used as fertilizer to help improve the sustainability and competitiveness of the agricultural and landscaping sector. This, together with the potential initiation of island-wide rainwater harvesting technology, will help bolster future water security and resilience.

The Seychelles Government also worked closely with MWH in the preparation of its ambitious Intended Nationally Determined Contribution (INDC) for the December 2015 Conference of Paris. This relationship will continue with MWH implementing another project, funded by the EU's Global Climate Change Alliance, to assist the Government in implementing the Seychelles Climate Change Strategy. This action will strengthen the climate change sector policy framework and support adaptation to climate change in coastal areas. Action steps will include implementation of measures to improve tracking of climate finance flows and capacity development within the Government, further supporting future water security.

The Government of Seychelles is building with community in mind through adopting an integrated approach to securing the country's water future. Recognizing that people, the environment, and a growing economy requires high performing infrastructure calls for infrastructure owners and suppliers committed to change. Despite the unique challenges faced as a small island developing state, Seychelles is embracing this challenge.

Author's Note

Dr. Evan Dollar is technical director of the MWH water resources team for Europe-Africa. He is responsible for strategy development for water and environment, water resources, and international water. He is currently leading the development of an Integrated Water Cycle Management (IWC/M) program for a water company in the UK and recently delivered a program of work in Seychelles for the European Investment Bank (EIB) on resource efficiency, an integrated and comprehensive sanitation plan, and a water strategy.