

CASE STUDY - BRISBANE RIVER, AUSTRALIA

INTEGRATED RIVER BASIN MANAGEMENT IN ITS INFANCY

*With reference to the Room for the River conference with the keynote speech given by:
Graeme Milligan**

■ After building the Wivenhoe Dam, the community of the Australian state of Queensland thought it had Brisbane River flood risks under control. After years of severe drought, attention for the river was largely focused on water quality and a diminishing supply of freshwater for the city of Brisbane. Then tropical cyclones and associated seasonal rainfall suddenly contributed to flooding large areas of Queensland in January 2011, including the flood plains along the Brisbane River. The Queensland Floods Commission of Inquiry was established to investigate the circumstances of the floods occurring which led to recommendations for better practices relating to community safety; land use planning; forecasting of flooding; and management and operation of water infrastructure being made. The Queensland Recovery Authority has facilitated the restoration of a great deal of the damage, but a consolidated integrated river basin management has yet to be determined. The current approach relies upon the co-operation and co-ordination of a number of policies and on the ground delivery agencies.

Geographical Context

■ The Brisbane River and its catchment is a significant river system in South East Queensland. The river flows through the city of Brisbane with an average discharge capacity of 6000 m³/s, and feeds into the Moreton Bay which then flows into the Pacific Ocean. The Brisbane River catchment has nine dams and weirs, which include its two main dams – Wivenhoe Dam and Somerset Dam. The Wivenhoe Dam was constructed for the purpose of water storage, freshwater provision for the city of Brisbane 80km downstream of the Dam and it contributes to flood mitigation for Brisbane and Ipswich. Its location divides the river into two parts. Upstream of the Dam, lies the source of the Brisbane River in an undulating landscape consisting of agricultural land uses. Downstream from the Wivenhoe Dam, the Brisbane River flows through a valley consisting of agricultural and rural residential land

uses. Closer to the coast, it flows through urban and industrial areas, including large cities such as Ipswich and Brisbane. Below the Wivenhoe Dam, the Lockyer Creek, Bremer River and Oxley Creek are significant waterways that contribute to water flows in the Brisbane River.

A drought that lasted most of the 2000's across Australia (particularly in Queensland) resulted in the Queensland government providing additional infrastructure including waste water recycling, a desalination plant, a pipeline network connecting multiple reservoirs and a water use efficiency program. The government owned corporation SEQwater is responsible for monitoring water supplies and levels in the main dams, including Wivenhoe Dam.

A great deal of attention has also been paid to the water quality of the Brisbane River. The high density of agricultural land uses along the river as well as waste water discharge into the river results in high levels of nutrients in the river's water. Much to the displeasure

* Mr **Graeme Milligan**, General Manager, Environmental Liaison, Queensland Reconstruction Authority of the approach to integrated river basin management in the Brisbane River catchment, Australia.

of recreational fishermen and nature lovers, this has resulted in algae blooms in the Moreton Bay. Healthy Waterways is a not-for-profit, non government organization working to protect and improve waterway health in South East Queensland. As a part of their Ecosystem Health Monitoring Program, they annually assess catchments and estuaries in South East Queensland to advise councils, land managers on areas of declining health, report on the effect of different land uses, and provide actions to protect the aquatic ecosystems¹.

SEQ Catchments is a community based not-for-profit organization that seeks to build a sustainable community and promotes the values of natural resources and the biodiversity of South East Queensland. SEQ Catchments works with Australian, Queensland and local governments to influence policy, align planning and secure funding for environmental projects as well as provides technical advice on data collection, vegetation management, water quality and property management to the community². With not-for-profit groups such as Healthy Waterways and SEQ Catchments, the coordination of caring for and enhancing the ecosystems that are our rivers and their catchments (in this case the Brisbane River and its catchment) can be promoted to the community, governments and other stakeholders.

Flood History and Risk Perception

From December 2010, Queensland was hit by seven severe weather events in a four month time period. Three of these events were Tropical Cyclones – Tropical Cyclone Tasha, Tropical Cyclone Anthony and Tropical Cyclone Yasi. These weather events brought a great deal of rain to an already sodden landscape resulting in the flooding of an area as large as France and Germany combined (or 41.5 times the size of the Netherlands).

After severe flooding in Queensland in 1974, the government of Queensland built the Wivenhoe Dam, which resulted in the perception that the Brisbane River no longer posed a threat. In early January 2011, the Brisbane River flooded resulting in large parts of the city of Brisbane being submerged or isolated by floodwaters. This led to many community members questioning the function of the Dam and its operation

before and during the rain events, noting that other rivers and major creeks contribute flows downstream of the Wivenhoe Dam.

One month later, the northern part of the state was hit by Tropical Cyclone Yasi, which resulted in extreme winds, storm surge and associated rainfall which contributed to flooding in some parts of the state. A total of 37 people were killed in the 2011 Queensland Floods and cyclones, 59 rivers flooded, 12 of which broke existing flood records and the World Bank estimated \$15.9 billion in total damages and economic losses with a public reconstruction cost of approximately \$7.2 billion dollars³.

Jurisdictional Responsibility

Queensland has been managing river basins under an Integrated Catchment Management policy for over twenty years. This integrated approach is central to natural resource management to ensure that individual issues and links are considered, developing holistic approaches to productive, resilient landscapes. This includes integrating economic, social and environmental values, as well as engaging the community and industry, in planning, decision making and delivery.

The Queensland Government works with thirteen non-statutory regional National River Management groups, local authorities and the Australian Government to manage our natural resources wisely, address environmental problems and build healthy regions. SEQ Catchments is the regional natural resource management group providing on-ground services in the Brisbane River catchment.

The states are responsible for river management in Australia, with Queensland being responsible for the Brisbane River. The integration and coordination of planning and implementation of flood risk management occurs between state government departments and agencies at a chief executive officer level.

After the January 2011 floods, the Queensland Floods Commission of Inquiry (QFCOI) performed a thorough investigation of the circumstances surrounding the deadly and destructive weather events. One of the main matters that was in focus of the QFCOI was to investigate the implementation of the systems operations plans for dams across the state and in particularly the Wivenhoe and Somerset release strategy and an assessment of compliance with, and suitability of the operational procedures relating to flood mitigation and dam safety.

During the QFCOI, an initial report was released in August 2011 including 177 recommendations, with the final report being released in March 2012. The implementation of QFCOI recommendations was split into implementation groups, which are overseen and coordinated by the chief executive officers of key government departments and agencies.

One specific recommendation relating to implementation of a study of the entire length of the

COMPARING WATER GOVERNANCE: AUSTRALIA VERSUS THE NETHERLANDS

Extended periods of drought have resulted in an Australian river management primarily focused on the freshwater supplies required for potable water, industrial and agricultural purposes. Water shortages are an ongoing issue, while excessive rainfall and related flooding, such as occurred in 2011, are still considered incidental.



The Brisbane River during the flood of January 2011 (source: Jason Royals, www.flickr.com)

Brisbane River, pertained to the principal of Integrated River Basin Management (IRBM). The Brisbane River Catchment Study is currently being performed by Department of Natural Resources and Mines (DNRM); Department of State Development, Infrastructure and Planning (DSDIP); Department of Energy and Water Supply (DEWS) and SEQwater in conjunction with the four relevant local governments. The study also links with the QFCOI recommendations to optimize management of the Wivenhoe Dam and water supply for the city of Brisbane.

Generally speaking, water safety policy in Australia is strongly focused on evacuation. After all, heavy local rains could result in flooding anywhere in this immense country. For this reason, policy has been focused on making local communities resilient against flooding and recovering from disaster events as soon as possible. Within the government of Queensland, the Department of State DSDIP; DNRM; DEWS; the Department of Housing and Public Works; the Department of Environment and Heritage Protection; the Department of Community Safety; and the Department of Local Government, Community

Recovery and Resilience are each partially responsible for different components of the water cycle. A cohesive water safety policy does not exist.

In addition to government agencies, there are two key non-government organizations contributing to the management and monitoring of the Brisbane River catchment. The Queensland Reconstruction Authority (QRA) has published specific planning guidelines accompanied by interim floodplain assessment mapping that identify areas that have the potential to flood, which identifies strategies to manage flood risks at a local and regional level. These guidelines also promote a multi-disciplinary approach to floodplain management which encourages interaction with numerous stakeholders to achieve a higher level of community and landscape resilience to the impacts of flooding.

Recovery Operations

Flood damage in 2011 was so great that the government of Queensland decided to appoint a special board to coordinate recovery operations. This

became the Queensland Reconstruction Authority, which is still fully active under the leadership of Retired Major General Richard Wilson, Chair of the QRA board. The mandate of the QRA has recently been extended until 2015.

Financing of recovery operations is under the Natural Disaster Relief and Recovery Arrangements. The Federal Government will contribute 75% of required money, and the state of Queensland will contribute 25%. Initially, the available budget for the recovery operations amounted to \$3.2 billion Australian dollars, but due, among other things, to additional flooding in 2012, the amount has currently been raised to more than \$12 billion Australian dollars. At present (March 2013), the pipeline of works for events actively managed by the Authority immediately prior to Tropical Cyclone Oswald in 2013 (2009 to 2012) has an estimated program value of \$12.2 billion of which \$10.9 billion has been administered in the program of works comprising of:

- \$1.0 billion dollars of reconstruction works under assessment;
- \$3.0 billion works in the market; and
- \$6.8 billion of works in progress or delivered.

Integrated River Basin Management

The challenge is to increase the level of protection against future flooding of the Brisbane River, and expand it into an Integrated River Basin Management (IRBM) approach. To achieve this, land uses must be examined. This will allow additional goals to be included in the management plan, such as nature preservation, mining, urban planning and agriculture.

Important items in this matter are:

- Involving stakeholders, and streamlining their individual activities.
- Collecting information from the many studies that have recently been performed, and are ongoing.
- Including the results of climate change, based on scenarios.
- Justifying costs as return-on-investment.

In order to implement an Integrated River Basin Management, land use and urban planning perspectives will require adjustment. The government of Queensland must develop a strategy for risk management. At the same time, a special governing organization to carry responsibility for the entire trajectory of the Brisbane River as its river commission, still does not exist. ■

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- 1 *Healthy Waterways – Ecosystem Health Monitoring Program* – <http://healthywaterways.org/EcosystemHealthMonitoringProgram/AboutEHMP.aspx>
 - 2 *SEQ Catchments – What we do* – <http://www.seqcatchments.com.au/what-we-do.html>
 - 3 <http://www.qldreconstruction.org.au/u/lib/cms2/world-bank-report-1.pdf>