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Queensland

Recovery and Reconstruction in the Aftermath of the 2010/2011 Flood Events and Cyclone Yasi

A report prepared by the World Bank in collaboration with the Queensland Reconstruction Authority

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The International Bank for Reconstruction and Development

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Top: Aerial Story Bridge post flood. Photo courtesy Brisbane Marketing.

Bottom left: Southbank flooding/©Lyle Radford; center: Ipswich flooding, January 2011/Photo Courtesy of The Queensland Times; right: Port Hinchinbrook/Photo Courtesy of The Townsville Bulletin.

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Flood damage reconstruction work undertaken by QBuild at Milperra. © The State of Queensland.

Port Hinchinbrook. Photo Courtesy of the Townsville Bulletin.

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Foreword

Towards the end of 2010 and in the early months of 2011, the State of Queensland suffered from devastating floods. Resulting from a series of heavy rains, followed by a category 5 Cyclone Yasi, the floods caused dozens of casualties, the evacuation of over 70 towns, and an excess of US$15 billion of damages and losses. The events washed away roads and railways, destroyed crops and brought Queensland's $20 billion coal export industry to a near halt, making the flooding one of Australia's most expensive natural disasters.

The Federal government and Queensland's State authorities responded swiftly with the help of Australia's Emergency Management system as well as the Australian Defence Force, effectively coordinating the evacuation, and providing relief and recovery support. In February 2011, the Queensland Reconstruction Authority was established to oversee and coordinate the recovery and reconstruction efforts. Major-General Michael Slater, appointed Chair of the Queensland Reconstruction Authority, has been leading the efforts to rebuild communities across the state affected by the floods and cyclone. Only four months after the floods, Queensland is well on the path to recovery. With the long-term goal of rebuilding a safer state, Queensland now faces the long-term issue of building resilience through risk reduction and integrated watershed management.

Australia and the World Bank are close partners in the efforts to aid developing countries on their path to sustainable growth, with Australia playing a significant role in the Bank's initiatives in the field of disaster risk management and climate change adaption, particularly through its dedicated support of the Global Facility for Disaster Reduction and Recovery (GFDRR). Following World Bank President Robert Zoellick's offer of assistance, the government of Australia accepted the World Bank's support for the reconstruction. The undertaking, based on the concept of a knowledge exchange where the World Bank contributes global good practice and at the same time learns from Australia's experiences in recovery, reconstruction and risk mitigation, took place in three phases. During the first phase in March 2011, a team of World Bank experts visited Queensland's affected areas, focusing on the overall reconstruction approaches and strategies. In the second phase in May 2011, Bank staff supported training courses for local government authorities on developing local reconstruction plans. In mid-June, a Memorandum of Understanding is to be signed between the Queensland Reconstruction Authority and the World Bank, which will further encourage knowledge-exchange initiatives, particularly in disaster risk management.

This report prepared by the World Bank, in collaboration with the Queensland Reconstruction Authority documents the achievements and progress made in Queensland and includes examples of global practice that the World Bank has collected in the field of reconstruction and risk reduction from across the world.

James Adams
World Bank Regional Vice President

Major-General Michael Slater
Queensland Reconstruction Authority Chair

Executive summary

South East Queensland flood disaster. Photo Courtesy of The Toowoomba Chronicle.

Executive summary

The Queensland flooding of early 2011 was Australia's largest natural disaster in recent memory. With a "ballpark" estimate of US$ 15.9 billion[1] in total damages and economic losses (with a public reconstruction cost of approximately US$7.2 billion), this is also one of the major international disasters of the last decade. The combined impact of the Indian Ocean Tsunami has been US$ 11.5 billion, and it is similar to major disasters in developed countries, such as the 1994 Los Angeles Earthquake (US$ 24 billion) or the 2002 flooding of the Elbe River in Germany (US$ 14 billion). As of March 2011, the government and private sector have mobilized an estimated US$ 11.8 billion (including insurance payments), representing 75 percent of the estimated damage and losses which is already above the 45 percent average of disaster coverage in developed economies.

The Queensland reconstruction effort meets international good practice standards in many ways. Building on a wealth of experience, the Australian authorities have responded rapidly to save lives, provide emergency funding to individuals and communities, and to set-up the institutions charged with the management of the recovery and reconstruction. Four months after the floods, Queensland is well on the path of recovery: local reconstruction plans have been prepared, most coal mines are back in operation and many families have received financial assistance to cope with the impact of the floods.

The government has made three key choices in the immediate aftermath of the disaster enabling speedy recovery. First, the army and volunteers assisted those in need immediately and subsequently managed the clean-up operation. Second, the government established a dedicated institution – the Queensland Reconstruction Authority (QldRA) – and charged it with the overall coordination of the relief and recovery effort. Third, financial support was provided immediately to the beneficiaries. The financial packages have the right balance between size, terms and eligibility criteria.

The state of Queensland focuses on "building back better" in order to reduce the impact of future disasters and create resilient communities. The QldRA declared building resilience as an overarching goal and seeks to integrate disaster risk reduction into the main lines of reconstruction. A framework of measuring results in this area is provided by Australia's National Strategy for Resilience of 2011. Flood risk management poses particular challenges in the areas of land use planning and river basin management that will need to be addressed.

In the months to come, it will be important for the QldRA to "connect the dots" and prepare for the transition to full-fledged reconstruction. Building on a comprehensive damage and loss assessment and a strong monitoring and evaluation system, there will be demand for strategic planning, and an assessment of sectoral and geographic gaps.

1 Figures based on compilation of damage and losses data from various sources including IBIS World, PriceWaterhouseCooper, and Prime Minister's Office. Exchange Rate AUD$ 1= US$ 1 (February 2011).

Introduction

South East Queensland flood disaster. Photo Courtesy of The Toowoomba Chronicle.

Introduction

Floods in Queensland

The 2010/2011 floods occurred after a prolonged period of drought, in quick succession, compounded intermittently by three major storm events and cyclones. Queensland, also called "the Sunshine State", traditionally experiences heavy rainfall in the months from December to March. However, in 2010, already by the end of November, much of eastern Australia, including Brisbane, saw crops soaking and water catchments fill, making them more likely to overflow in case of heavy rains. 2010 ended being in fact the third wettest year on record, according to the Australian Bureau of Meteorology. This is a stark contrast to the previous years when Queensland suffered severe droughts.

This season, a particularly strong La Niña weather pattern appeared, leading to warmer waters near the northeastern coast of Australia, making Queensland particularly susceptible to tropical storms. On 25th December, Cyclone Tasha made landfall south of Cairns with 150-250 mm of rainfall. This was preceded by three heavy rain events all taking place within three weeks of December. In addition, on February 3rd, Category 5 Cyclone Yasi crossed Queensland coast at Mission beach and Tully south of Cairns, becoming the worst cyclone to hit Australia since 1918, with 290 km/h winds, destroying homes, businesses, along with infrastructure and agricultural crops in the already suffering area.

Floods are not unknown to Queenslanders. The Commonwealth, States and Councils can rely on decades of experience, institutional memory and well-established financial and physical delivery mechanisms for effective and efficient disaster response. The La Niña years of 1916, 1917, 1950, 1954 through 1956, and 1973 through 1975, were accompanied by some of the worst and most widespread flooding this century. In January 1974, a cyclone brought heavy rainfall to Brisbane and many parts of southeastern Queensland and northern New South Wales with a third of Brisbane's city centre and 17 suburbs severely flooded leaving 14 people dead, over 300 injured, 56 homes washed away and 1,600 submerged. Since the catastrophic floods of 1974, there have been major flood events in various parts of the State. In April 2010, over one million square kilometers of Queensland and New South Wales were flooded during which some 2,000 homes were inundated. However, the 2010/2011 floods have been historically unique due to their causes and wide-ranging impact.

Australia's climate, punctuated by cycles of drought and intense rain events, make the county susceptible to flooding. Cyclones take place seasonally between October and May. La Niña, weather pattern that affects the Pacific Ocean region, is known as the wet counterpart of the El Niño weather pattern generally associated with drier conditions. During La Niña, the cold water that pools near the coast of South America surges across the Pacific and there is a greater build up of warmer water along the eastern coast of Australia. As a result, there is a greater contrast in the sea surface temperatures between the east and west Pacific, and a greater contrast in air pressure. The easterly trade winds become stronger due to this contrast, dragging warm, moist air along the Australian coastline, creating larger rain clouds and producing more rainfall.

Table 1. Queensland Floods Timeline

September-November	Large parts of eastern Australia, including Queensland, experience the wettest spring season, soaking crops and filling water catchments.
December 3	First series of heavy rain hits central Queensland, causing much damage in the town of Emerald.
December 10-13	Central Queensland hit again with torrential rains, causing localized flooding, and strengthening floodwaters.
December 19-20	Strong rains for the third time recorded in Queensland, causing flooding.
December 24	Many river catchments are soaked.
December 25	Tropical Cyclone Tasha makes landfall near Gordonvale south of Cairns, bringing rainfall of 150-250 mm.
December 28	After six more days of contact rain, disaster is declared for the towns of Chinchilla, Theodore and Dalby in southern Queensland, prompting mass evacuation.
December 30	Bundaberg north of Brisbane experiences heavy flooding.
January 1	Airport at Rockhampton is cut off by a deluge from soaked inland areas.
January 3-4	Rockhampton is cut off by rising floodwaters. Other cities brace for record flooding, and it is expected that floods will last for weeks.
January 5	Violent storms overnight cause flash flooding in Brisbane.
January 12	Brisbane flood levels reach peak, causing widespread flooding with dozens of suburbs and thousands of properties are inundated.
January 17-18	Floods menace Victoria State. Residents of Kerang evacuate.
February 2 2011	Category 5 Cyclone Yasi hits south of Cairns.

Source: Telegraph.co.uk, 4th Jan 2011; Australian Geographic February 3 2011

Impact

73 out its 73 Local Government Areas (LGAs) or Councils in Queensland declared the State of Emergency due to the flooding events. Queensland experienced both slow-onset and deep inundation events as well as flash floods in various low-lying parts and valleys of Queensland. The floods inflicted significant damages and losses to private properties and businesses, and a vast number of public infrastructures.

"Ballpark" estimates indicate cumulative damages and losses from the floods and cyclones in the 2010/2011 period reached at least AUD$ 15.7 billion resulting in a consequent lowering of Queensland growth estimates from 3 percent to 1.25 percent. These damages include:

- damages to more than 9,100 km of state road network and approximately 4,700 km of the rail network;
- power disruptions to approximately 480,000 homes and businesses;
- 97,000 insurance claims in respect of damages to private assets, of which 50-60 percent are for privately owned residential properties;
- damages or disruptions to 54 coal mines, 11 ports, 139 national parks and 411 schools;
- estimated losses of $ 875 million to primary industries, primarily the sugar, fruit and vegetable sub-sectors;

Table 2 below provides the initial sectoral damage and losses estimates compiled from various sources in March 2011.

Table 2. Estimate of Damage and Losses, Queensland Flood & Yasi Cyclone (In AUD$ bn)

Sector	Estimated Damage and Losses	Data Sources
Mining	2.5	PriceWaterhouseCooper
Agriculture	1.6	IBIS World (Market Research Company)
Housing	4	IBIS World (based on construction value of damage homes)
Infrastructure	5	Prime Minister's Office
Commercial Properties	2	IBIS World
Tourism	0.6	IBIS World
Total	**15.7**	

Response and early recovery

Australia's disaster response has benefited tremendously from prior disaster management arrangements and preparedness. Disaster response has been largely indigenous, public-sector led and private-sector supported, without any significant reliance on the international community. The Commonwealth Government of Australia has indicated that it will invest AUD $ 5.6 billion in rebuilding flood-affected regions, including around AUD $ 3.9 billion to be allocated as the Australian Government's share of Natural Disaster Relief and Recovery Arrangements (NDRRA)'s expenditures (75 percent). Likewise Queensland government has pledged about AUD $ 2.1 billion funding for financing recovery and reconstruction. However final recovery and reconstruction costs, particularly including premiums for building-back-better and longer term disaster risk reduction, are likely to be even higher. As of mid March 2011, the following had been achieved:

- **Human and Social protection**: More than 630,000 Australian Government Disaster Recovery Payments have been made totaling $725m of which 60 percent were flood-related and the rest were related to the recent cyclones; more than 57,000 Disaster Income Recovery Subsidies have been granted, totaling $60m, of which 92 percent were flood-related; more than 60,000 claims have been made under NDRRA provisions; and 409 of the 411 affected schools made operational from their original locations.
- **Economic**: Of the 54 affected coal mines, 49 have returned to full or partial production; more than 1600 grant payments have been made to primary industry/producers worth more than $8m; and more than 2100 grant payments to small businesses worth nearly $11m have been processed.
- **Environment:** Across Queensland 83 sewage schemes were affected. As at 6 April 2011, 76 of those affected schemes were operating within approved regulatory standards. 103 water supply schemes were affected and all are now operating within approved regulatory standards. Of the 389 stream flow gauges across the state, 36 were structurally affected by the extreme weather events. Preliminary or temporary repairs had been performed on 34 of the 36 gauge sites as at 1 April 2011; and 175 out of the 279 national parks closed due to extreme weather events have re-opened.
- **Private Recovery**: Power was restored to 99 percent of 480,000 affected homes and businesses; $310m

paid in insurance claims, while another $2.5 billion estimated claims are yet to be paid for which public sector facilitation has begun; a quick GIS-based housing damage database and 'interactive map' has been developed and made accessible to the public – which is the most-frequented site on the QldRA website, with more than 22,000 unique visits, out of the total of 23,500 visits made at the QldRA website in less than a month since its inception. The latter marks the rapid commencement a participatory and inclusive process for damage verification and grant eligibility determination which can be considered as a good practice example, with potential for international replication.

- **Roads and Transport**: More than 40 percent of the 9,170 km of affected state roads have been re-operationalized; 3,807 km of the affected 4,748 km of rail network have been restored to service; and 10 out of the 11 affected ports restored to full operations.

- **Community Engagement and Communications**: A community assistance and outreach campaign - the "Join Forces Program"- was launched in February 2011 to foster, facilitate and catalyze partnerships and synergy-building across community organizations, clubs, local governments, businesses and individuals. Up to 54 community organizations have signed up for the program with 5 successful matches or purpose-specific partnerships. A two-way communications system with the communities was established by the QldRA. The QldRA has also received early community feedback - by March 2011, it received a total of 258 calls and letters. In addition, the QldRA website, launched in mid-February 2011, recorded over 23,000 unique visits in the space of less than a month of its existence.

Repair works on a section of the Warrego highway. © The State of Queensland.

Box 1. Good Practice: Post Flooding and Cyclone Cleanup

The town of Grantham in the Lockyer Valley Regional Council of Queensland was one of the hardest hit communities in the recent flash flood. On 10 January 2011, this town of around 300 people was swept by an inland tsunami with the depth of more than 6 meters in some areas.

- Following an extensive search and rescue operation, the community with the support of the army and police personnel and volunteers started a cleanup operation on 18 January 2011. The Local Council and the community coordinated the cleanup of the debris, and within three weeks, the flood impacted areas have been cleared from the debris and collapsed buildings. In other towns also inundated by the January 2011 flood, similar cleanup operations were also carried out with more than 15,000 volunteers working alongside emergency response personnel.
- Post disaster cleanup was among the standard early recovery schemes in Australia's disaster management framework. Following Cyclone Yasi which struck the northern part of Queensland, the Commonwealth and State governments established a $20 million Rural Resilience Fund. The Operation Cleanup – Employment component of this initiative provides an opportunity for unemployed local farm and tourism workforce in the cyclone affected areas to be employed in the cleanup operation. This scheme enables affected residents to remain in their communities and to take an active role in the re-building effort, where they can also receive training and other assistance to increase their job prospects.

Provision of early recovery assistance to the disaster impacted communities to clean up the debris from destruction left by a catastrophic event has been a common approach in recent post disaster recovery practices around the world. Experiences from the Indian Ocean Tsunami, Haiti Earthquake to Pakistan Flood suggest that such a program is well suited for community context where rural livelihood or labor intensive employment was impacted by the disaster. In the context of Queensland reconstruction, which covers a geographically vast area, such a scheme could be expanded to include a longer-term reconstruction effort such as rebuilding community infrastructure important for the community's long-term social as well as economic recovery.

Box 2. Good Practice: Cairns Local Disaster Coordination Centre

Opened in December 2010, the dedicated centre was funded through the Australian Government's Regional and Local Community Infrastructure Program, the Queensland Government and Cairns Regional Council.

The building is designed to withstand Category 5 cyclones and has independent emergency power and water sources. The centre is enabled for the synchronized delivery of information and relief to the community during a crisis situation. It is connected directly to Cairns Regional Council's data systems at the administration building via optic fibre link. Council's team also uses the center for disaster management training, education and planning activities including external community groups such as SES, Red Cross, schools, and volunteer groups.

Source: Cairns Regional Council (http://www.cairns.qld.gov.au/about-council/media-and-public-notices/media-releases/releases/cairns-local-disaster-coordination-centre)

Aerial Story Bridge post flood. Photo courtesy Brisbane Marketing.