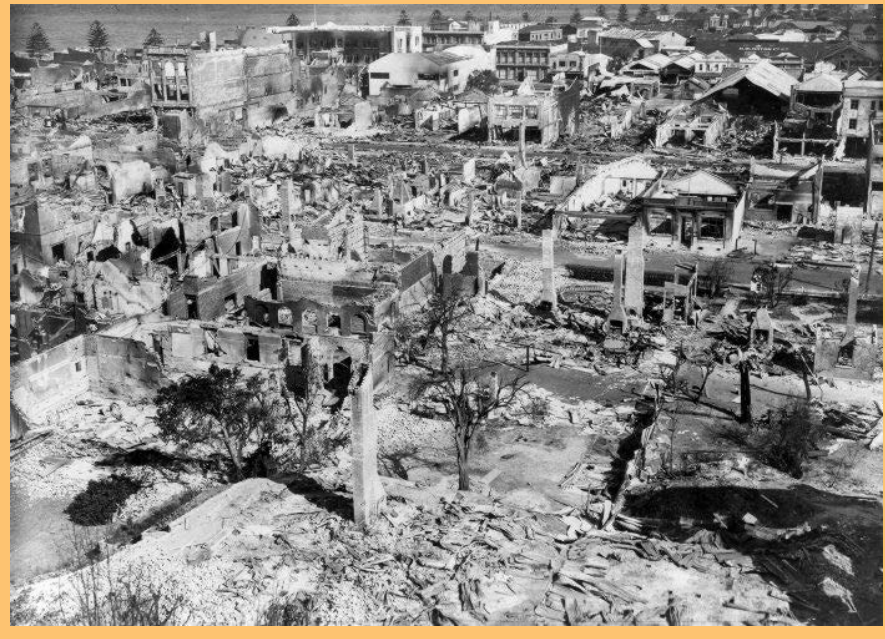


FOSTERING DISASTER RISK REDUCTION FOLLOWING DISASTER: AN EXAMPLE FROM NEW ZEALAND

Mischa Hill & JC Gaillard

School of Environment, The University of Auckland, New Zealand



Napier Central Business District damaged by the 1931 earthquake (S.C. Smith / A. Turnbull Library)

Rebuilding Napier following the 1931 earthquake

On 3 Feb. 1931 at 10:46 am, the city of Napier, in Hawke's Bay, experienced a magnitude 7.8 earthquake, which resulted in one of the worst disasters in New Zealand's history. The reconstruction of the city was an immense task in the time of global and national economic depression which characterised the early 1930's. Despite this hardship the rebuilding of Napier was a milestone on a local and national scale for integrating Disaster Risk Reduction (DRR) into contemporary and future post-disaster reconstruction policy and practice. The subsequent boxes (see also Hill and Gaillard, submitted) indicate that: a) post-disaster reconstruction does not inevitably have to be rushed while still being relatively quick, and b) integrating DRR does not necessarily require much time to factor in.



Plaque commemorating the reconstruction of Napier after the 1931 earthquake (JC Gaillard, Aug. 2010)

BEFORE

AFTER

LOCAL



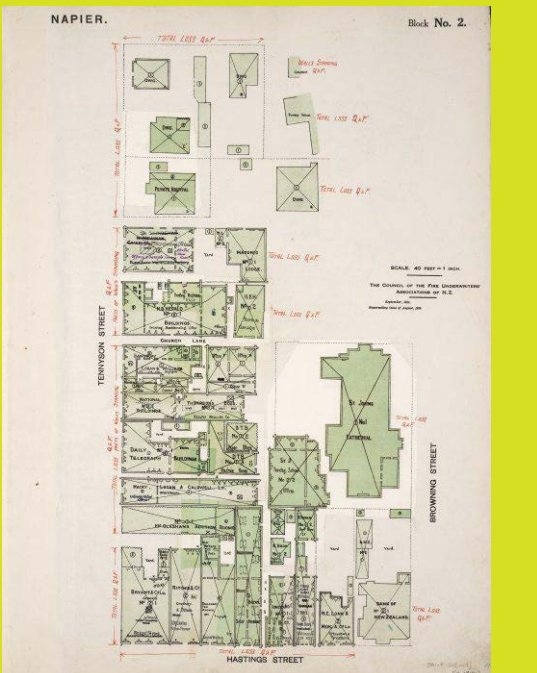
Napier Central Business District in 1929 (P.C. Sorrell / A. Turnbull Library)

Layout of the city

The layout of the city reaped consequences during the earthquake. The high concentration of buildings in the CBD with relatively narrow streets exacerbated the damage and danger caused by falling infrastructure and

Layout of the city

Within the CBD, all streets were widened to allow for structures to collapse without blocking access in case of emergency. Service lanes were put in behind blocks of buildings to enable access for delivery and emergency vehicles.



Reconstruction for the Central Business District of Napier after the 1931 disaster (A. Turnbull Library)



Buildings damaged by the 1931 earthquake in central Napier (Anonymous / A. Turnbull Library)

Architecture

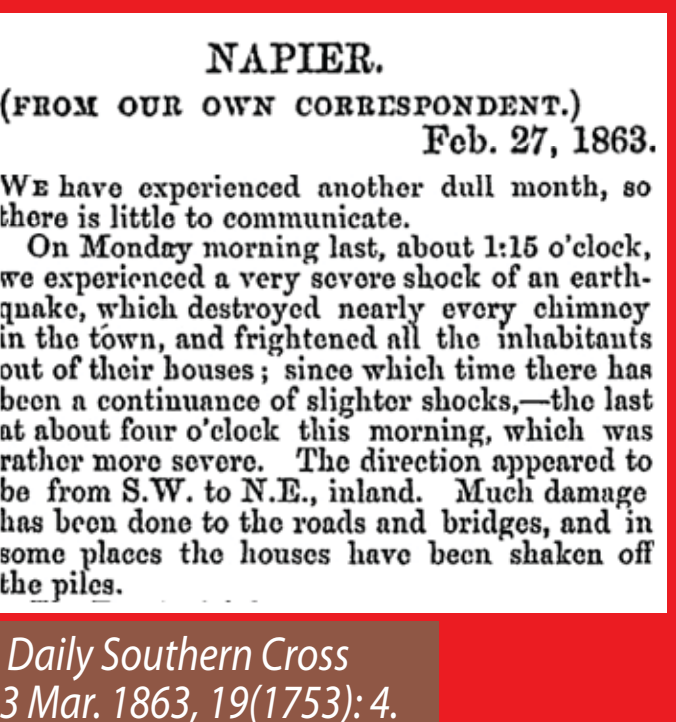
Buildings varied in height, mostly above two storeys high. Many had facades that proved very dangerous during the earthquake. Numerous were made of unreinforced masonry.

Architecture

New buildings erected in the aftermath of the 1931 disaster do not exceed two storeys. They also included the use of reinforced concrete boxes and the splaying of corners. The construction of veranda was strictly regulated.



Rebuilding in central Napier including resistant framing and splaying of the corner (Anonymous / A. Turnbull Library)



Risk perception

Hawke's Bay and Napier have experienced many significant events in the past few centuries (Johnston and Pearse, 1999). Despite this however, prior to the 1931 earthquake little attention and awareness was placed on natural hazards such as earthquakes.

Risk perception

People's perception of the risk associated with earthquakes seems to be high as indicated in a study conducted in 2008 (Hawke's Bay Regional Council, 2012). People seem to be more prepared to the eventuality of an earthquake as many have stored emergency equipments, food and water (Ronan et al., 2001).



Information board on the 1931 disaster in central Napier (M. Hill, Aug. 2011)

NATIONAL

Science

In 1931, there were limited scientific and engineering studies to draw upon so that the Napier CBD looked widely to examples from cities recently affected by earthquakes and which had to be rebuilt such as Santa Barbara and Tokyo.

Science

The 1931 disaster led to a significant improvement in earth scientists' and engineers' understanding of seismic and associated phenomena and their impact on buildings and infrastructure. Although lessons were later learnt in building construction about flexibility, the reconstruction was only limited by the extent of science and knowledge available at the time.

Building code

There was no building code for New Zealand until after the 1931 Napier earthquake however, the municipal Corporations Act in 1867 allowed building construction to be regulated through local bylaws.

Building code

The New Zealand Standards Institution was created in 1932 as a direct consequence of the Napier earthquake. A nation wide building code bylaw was put in place by 1935. A bit later, the town and Country Planning Act of 1953 also gave power to local councils to refuse to issue permits for the reconstruction of disaster-damaged buildings if those were not expected to meet current standards

Insurance

Insurance that was around prior to the earthquake was only viable to the wealthy that could afford this cover. And even of the insurance provided little accounted for earthquake and fire damage.

Insurance

In 1941, however, the Earthquake and War Damage Act, directly reflecting upon the impact of the 1931 disaster for local communities, set the ground for an insurance programme covering all New Zealand citizens. This was formalised in 1945 with the formation of the Earthquake Commission (EQC) which imposed compulsory earthquake and war insurance throughout the country.

References

Christoplos I. (2006) The elusive 'window of opportunity' for risk reduction. ProVenton Consortium Forum 2006, 2-3 Feb. 2006, Bangkok.
Hill M., Gaillard J.C. (submitted) Integrating disaster risk reduction into post-disaster reconstruction: a long-term perspective of the 1931 earthquake in Napier, New Zealand. *New Zealand Geographer*.
Pearse L., Johnston D., Becker J. (2001) Managing natural hazards in the Hawke's Bay, New Zealand. *Australian Journal of Emergency Management* 16: 37-39.
Ronan K.R., Johnston D.M., Paton D. (2001) Communities' understanding of earthquake risk in the Hawke's Bay and Manawatu-Wanganui regions, New Zealand. *Proceedings of the 2001 New Zealand Society for Earthquake Engineering Conference*. NZ Society for Earthquake Engineering, Wellington.

Pathways to DRR in reconstruction

- Enhanced perception of the risk associated with natural hazards
- A better understanding of the role of urban development in creating disaster risk
- Stronger institutions and legal frameworks for disaster risk reduction
- Sturdier buildings and infrastructure
- An influx of financial and other resources
- Increased political will for change (Christoplos, 2006)

Key factors

- Prime attention was given to long-term reconstruction immediately after the disaster
- Rebuilding Napier was designed as a balance of continuity and change
- The decision-making process was decentralised and straightforward, enabling an integration of top-down and bottom-up initiatives
- The reconstruction process relied on local resources, thus avoiding an influx of delaying, duplicating and disempowering external resources