

Examining Acceptable Risk

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1 Introduction

In Australia, the development of hazard specific legislation, policy and guidelines, which aim to minimise community exposure to natural hazards, suggests principles of sustainable development have begun to amalgamate risk management and land-use planning processes. However the development of potentially hazardous environments, for example urban floodplains susceptible to flooding, continues to occur as a result of contemporary land-use planning and risk management processes. Why is this an outcome of past and present risk management and land-use planning processes? The thesis from which this abstract is drawn suggests a significant factor contributing to this outcome of increasing development within hazardous areas is the variation between knowledge, understanding and management of risk (particularly acceptable risk) by stakeholders.

2 The Study

2.1 Aim

For land-use planning purposes, Australian Local Governments select levels of flood risk or exposure they consider to be 'acceptable' for given land-uses. One example is the commonly applied 1-in-100-year design flood for residential land, which is a level chosen by local governments as acceptable for the community. However, Local Government is not the only stakeholder to make decisions regarding 'acceptable' flood risk. Within the planning and risk management frameworks for floodplain land-use, it is possible to identify two additional stakeholder groups who also participate in the decision-making process – members of the development industry and the floodplain occupants. There has been little research to examine how the flood standards adopted as 'acceptable risks' by decision makers such as Local Government (and communicated via a technical language) are interpreted by other stakeholders, and whether the formal standards can be accurately labeled 'acceptable risks'. This thesis aims to examine:

- (1.) The perception of 'acceptable' risk by the stakeholders (Local Government, the floodplain occupants and the development industry); and
- (2.) The risk management context and land-use planning context of an urban floodplain (Guragunbah and the surrounding suburbs within the Nerang River Catchment, Gold Coast).

2.2 Case Study Region: Guragunbah and the Nerang River Catchment

An Australian example of an urban floodplain - Guragunbah (Carrara-Merrimac) and the surrounding suburbs on the Gold Coast - provides the case study of this project. Guragunbah is located within the lower catchment of the Nerang River system. It is recognised by the Gold Coast City Council (GCCC) that this is a floodplain and previous flood events have affected residents and infrastructure (1956, 1974). Population growth during the 1960s and 70s saw the area converted into a variety of land-uses comprising residential, tourist and commercial development. With the last moderate to major flood occurring in the early 1970s, the majority of development and population growth within the case study area has occurred during relatively minor and flood-free periods. The Gold Coast City Council undertook a thorough examination of the Nerang River catchment in the early 1990s, resulting in the Guragunbah (Carrara-Merrimac Floodplain) Hydraulic Master Plan and the designation of the floodplain as a special development area. This allowed for the development of land-use regulations that have been applied to other flood-affected areas within the Gold Coast. The management and associated land-use planning regulations established for flood-affected areas suggest the Local Government *has* acknowledged the flood hazard situation faced by the city and adopted levels of 'acceptable' flood risk for the community based on their own technical assessments and balancing of

the flood hazard and urban land-use.

3 The Results

Interviews were conducted with representatives from the Local Government and Development Industry. A written questionnaire was administered to residents within the case study region. The results of this research indicated stakeholders external to the Local Government (residents and some members of the development industry) did not understand the risks of flooding represented by the formal standards (i.e., 1-in-100). The residents and some of the development industry generally underestimated potential flood exposure - a common misinterpretation was that flood standards could remove flood risk. The results also indicated that variations existed in the risks considered to be 'acceptable' by the stakeholders, particularly when the potential impacts associated with events such as a 1-in-100 year flood were illustrated graphically.

4 Opportunities for Management Change

4.1 What can be done to address perception within Land-use management?

From the results and the planning and risk management frameworks, it was possible to identify four opportunities Local Government may have to address perceptions of acceptable risk and realign standards with the flood risks considered to be acceptable by the community:

- (1.) Changing the approaches adopted by Local Governments when constructing planning schemes and establishing minimum levels of 'acceptable' risk, based on the community's perception of risk;
- (2.) Modifying the existing planning standards (lowering or raising minimum levels of 'acceptable' risk) and decisions associated with permissible individual land-use;
- (3.) Mitigating the existing flood risks and exposure to levels considered 'acceptable' by stakeholders through, for example, raising dam or levee walls; and
- (4.) Educating and communicating flood risks, acceptable risks and associated flood impacts to stakeholders by means other than quantitative expressions, for example, through photographs.

4.2 Response from the 'Real World'

But what can Local Governments *realistically* do to realign the risk standards adopted for land-use planning and management and the flood risks considered 'acceptable' by the community? In an attempt to answer these questions, the results of the research and the above-mentioned opportunities for management change were presented to representatives from the Gold Coast City Council. From the Local Government's perspective, there are five issues that inhibit the realignment of standards to the risks considered acceptable by the community:

- (1.) Resource availability and prioritisation;
- (2.) Stakeholder identification and knowledge levels;
- (3.) The uncertain nature of flooding;
- (4.) Lack of political will to initiate change; and
- (5.) Inadequacies with State Government management and guidance.

While these issues represent significant obstacles, it was suggested that Local Governments could potentially realign standards with the risks considered acceptable by the community through a combination of:

- (1.) Engineered structural mitigation measures that address levels of exposure and residual flood risk. Structural mitigation measures have been criticised in the past for having negative effects on stakeholder perception, to the point of contributing to increased populations at risk through the 'levee effect'. However, this research proposed the use of mitigation to realign existing levels of exposure with the risks considered 'acceptable' by the community and not as an attempt to alter community perceptions; and
- (2.) Education that seeks to enhance levels of knowledge and understanding of flooding not only within the general public, but also within the Local Government and development industry.

