

Flood Mitigation With and Without 'Planning': The Roles of Ideas, Interests and Institutions

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Abstract: Planning for the land uses in cities and planning for the hazards that impact on cities have only slowly begun to connect with one another. This paper uses historical floods in Brisbane and a framework of 'ideas, interests and institutions' to explore the range and impacts of flood responses since the 1890s. For much of Brisbane's history there was no coherent land use planning so both the land use planning system and its integration with flood mitigation are relatively new. The first major floods affecting the modern settlement were in 1890 and 1893 but other serious floods followed in 1908, 1931, 1974 and 2011. Numerous more moderate floods also occurred over this period because much of the city is built on a floodplain. The paper explores the proposals that have been put forward and by whom, the outcomes of these proposals and the effect of the growing institutionalisation of urban planning. It identifies the ideas, interests and institutions involved. There are lessons for better informed urban land use planning and for better hazard mitigation.

Introduction

Flooding has been part of Brisbane's history since before European settlement. Within the last 200 years there were major floods in 1841, 1857, 1887, 1890 and 1893 (when there were actually three floods in February and another in June), then 1908, 1931, 1974 and 2011. As shown in Figure 1 there have also been a number of less severe but still 'moderate' floods. Clearly living in Brisbane means living with floods and their impacts. The magnitude of these impacts escalated as the city grew when greater concentrations of people, buildings and infrastructure led to greater losses. With each major flood there was public agitation that 'something must be done'. People put forward ideas, special interest groups clamoured for attention and governments and other institutions weighed up, or modified, or put in place, or ignored the proposals. The questions asked in this paper are firstly, what proposals have been put forward, by whom and what were the outcomes of these proposals? And then related to this, what has been the effect of the growing institutionalisation of urban planning on planning to deal with floods?

Ideas, Interests and Institutions

A useful approach to understanding effective (but also ineffective) policy making is to clarify the roles of the ideas, interests and institutions involved, the ways these interact and the impacts each has by itself and in combination (Hay 2004; Kern 2011; Murphy 2012; Pojani and Stead 2014; Reitab 1998; Smith, Mitton, Davidson & Williams 2014). Because it seeks to understand the ways that policies are formulated and implemented in practice, the ideas-interests-institutions framework shares a common feature with two other major policy approaches: that of 'urban governance' (Minnery 2007) and that of 'policy networks' (Gale and Cadman 2014; Sohn and Giffinger 2015). All three identify critical roles for non-government actors (including the private sector and the wider community) in public policy-making. Gale (2013) notes that both urban governance and policy network approaches tend to characterise "the state (or 'government') in its entirety as having a single, essential nature" (p. 277), whereas in reality there are competing views amongst the agencies within government. The policy network approach allows for a full range of public, private and civic interests and institutions yet even then it fails to allow for the powerful role of ideas (Béland 2010, Bell 2012, Bell and Hindmoor 2014). By following the ideas-interests-institutions framework this paper builds on the policy network and urban governance approaches but extends beyond them.

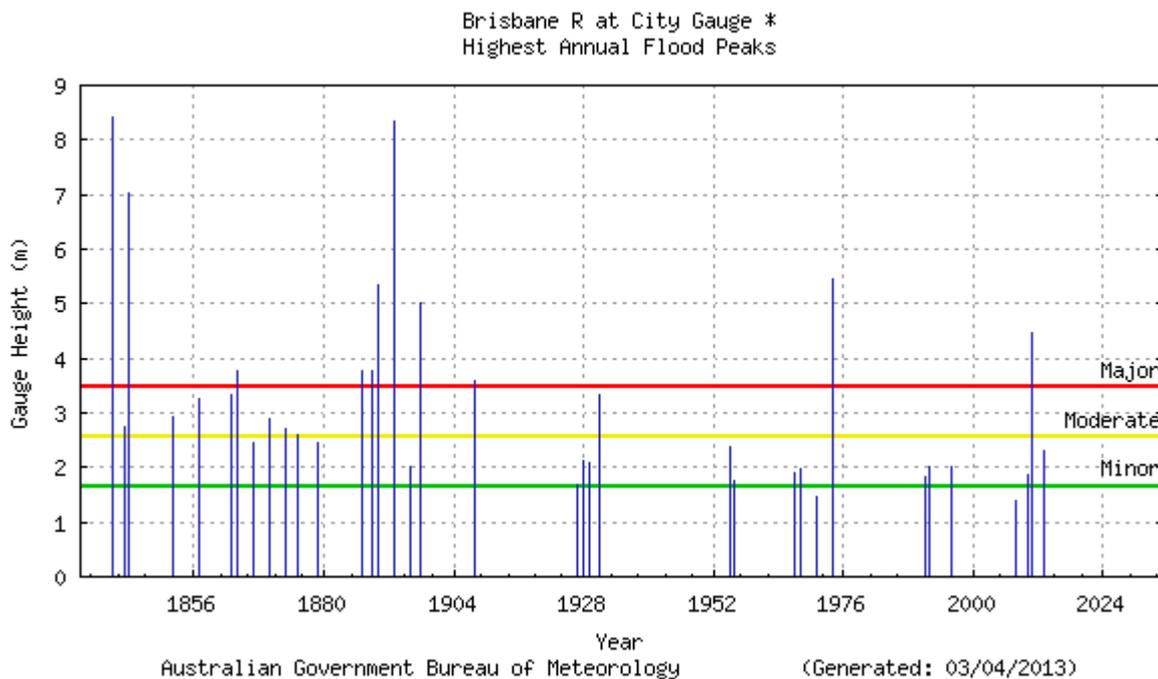


Figure 1: Brisbane Floods 1840s to 2014 (Source: Bureau of Meteorology 2014)

There is a good general understanding of what is meant by 'ideas', 'interests' and 'institutions' although details differ. Gallez, Kaufmann, Maksim, Thebért and Guerrinha (2013) also argue that although they are often used as three separate entry points to an understanding of policy there are clear benefits to integrating and combining them.

Gallez et al. (2013, p. 1242), when they refer to *ideas*, mean "the intellectual dimension of public action: the values, beliefs and norms which influence the formulation of problems and the choice of political solutions." This is because they are "claims about descriptions of the world, causal relationships, or the normative legitimacy of certain actions" (Parsons, 2002, p. 48, cited in Béland, 2010, p. 148). Pojani and Stead (2014, p. 2404) view 'ideas' as encompassing both 'norms' (which are "taken-for-granted values, attitudes, assumptions, and identities that policy makers have themselves, or assume the public will share") and 'programs' ("precise guidelines that specify how to solve particular policy problems", which are "based on well-established norms, within existing institutions, and with available tools" (2014, p. 2404)). Thus ideas involve both the creation of ways of solving problems as well as the normative legitimization of these creations.

For Gallez et al. (2013, p. 1242), *interests* are "the strategic dimension of public action, that is to say, the manner in which actors formulate their objectives and their demands, negotiating representation and putting strategies into place to defend them." Pojani and Stead (2014, p. 2404) are less clear about what they understand by 'interests' but identify the way that "the pursuit of self-interest and group competition substantially affect policy making." In other words interests are groups or individuals that wish to exercise influence and so see their ideas implemented. In a policy sense, interests are policy actors.

Institutions are a particular form of policy actor. Gallez et al. (2013, p. 1242) refer to "institutional logic" rather than specifically to institutions, and this logic is "the manner in which formal action frameworks (laws, institutional organization and procedures) influence the individual decisions." In their approach then an institution is such a "formal action framework." Pojani and Stead (2014) see 'institutions' as "the formal or informal procedures, routines and conventions embedded in the organizational structure of the polity or the economy" (p. 2405). Institutions are not limited just to state agencies; they include a range of formalised and semi-formalised non-state actors, organisations and bodies. They play a crucial role in the polity and the economy as they are "socially devised constraints that filter ideas and shape the interaction of interest groups" (Pojani and Stead 2014, p. 2405). Institutions change over time and as Fuller (2010) notes this change can be uneven and contested, particularly where there are historically inherited institutions involved that are competing with new or evolving institutions. This paper demonstrates that institutions may also be the sources of resources such as money and legitimacy.

The 'three-Is' or ideas-interests-institutions framework thus allows for three entry points into policy analysis and is a framework that supports dynamic policy analysis as well as the interactions amongst the three-Is over time. This paper will use this framework to investigate the ideas, the interests and the institutions involved in addressing (or not addressing) the issues arising from Brisbane's historical vulnerability to flooding and the changing relationship of this flood abatement effort with the evolving land use planning system.

Early Brisbane Flood Abatement Proposals

The starting point for this analysis is the major flood of 1890 and the so-called Great Flood (or Floods) of 1893. Because the 1893 floods came only three years after that of 1890 the memory of the impacts was still fresh and although many people took precautions the severity, scale and repetition of the "Black February" 1893 events (actually two major and one moderate flood in February, plus another less severe flood in June) caught the population unawares. In the first of the February floods the Victoria Bridge linking the north and south of the river was washed away as was a part of the rail bridge at Indooroopilly. A number of suggestions for dealing with future floods emerged after the experience of 1893 but a confounding factor in effecting any change was the number of potentially competing human purposes the river served. This remains true today. There are thus a variety of interests in the future of the river, so the river and the city maintain a "fraught relationship" (Powell 2015, n.p.). River transport was an early and critical functional interest. The main port was near the city centre until the creation of the new Port of Brisbane at Fishermans Island in the 1970s (Port of Brisbane 2010). A bar at the river mouth was removed in 1864 to allow better shipping access to the river (BCC City Design 1999) and the full river channel had been dredged since 1862. The 1893 floods shoaled all the dredged channels and reduced the depth of the river bar, requiring immediate active dredging. The Brisbane River is also a source of water for the city. This purpose was enhanced with the completion of the Somerset Dam in 1959 (SEQ Water 2013a) and the Wivenhoe Dam in 1984 (SEQ Water 2013b). The river is also a recreation resource and more recently it has become a focus for civic pride as a backdrop for the modern 'river city'. It has been a barrier to cross-river travel, overcome through the construction of cross-river bridges and through cross-river ferries.

Historically these transport, water supply, recreation and civic activities have created interests that have in turn influenced the reception of flood abatement proposals. A number of suggestions for flood abatement followed the experience of 1893. Whilst some were implemented without serious controversy, contestations involving the different uses of the river and the associated interests created barriers to the implementation of other proposals. One proposal that was readily agreed to but still took some time before it was fully implemented was to improve the flood warning system for the city. A warning telegraphed to Brisbane for the first 1893 flood by the prominent pioneer, and later Member of the Legislative Assembly (MLA) for Stanley (1904-20), H.P. Somerset, was misunderstood or ignored, but certainly there was no system in place to spread warnings for the telegram was just posted outside the Post-Master General's office and no further action was taken (Powell 2015). Somerset also tried to issue a similar warning for the third flood of 1893 but the telegraph lines were down. Following this debacle a river monitoring and warning system was established linked by telegraph to the towns and cities on the river. But the idea of issuing flood warnings and of having better a understanding and forecasting capacity for the behaviour of the river on the basis of observation and weather records developed slowly over the years. Forecasting had improved dramatically by the floods of 2010/11 but there was still debate at the time about the efficacy of the Commonwealth Bureau of Meteorology's ability to model potential flooding based on rainfall records (Australian Water Association 2011).

Some things were not done after the 1893 floods, however, or were eventually realised only many years afterwards. The ideas were there, but there were competing interests and a considerable degree of institutional inertia (or even conflict). The Queensland Colonial government set up an inquiry into flood mitigation under the direction of the Water Supply Department Queensland and the Government Hydraulic Engineer, J. B. Henderson after 1893. Henderson reported to parliament in 1896 (Henderson 1896). As a hydraulic engineer most of his recommendations were for 'hard' mitigation solutions which he summarised as being for "widening, deepening and regulating the river below the city" (p. 1). His main focus was on abatement of flooding in the city area, for which he proposed four alternative schemes, although aspects of each could be combined. He emphatically did not support the idea of a flood mitigation dam, nor the proposal being floated at the time of two canals paralleling the river, nor did he support the use of levees. His recommendations related to both flood

abatement and to improvement of the navigability, thus connecting two of the main interests in the river at the time. Henderson did say:

until some scheme of river improvement can be put in hand, I would strongly advise that steps be immediately taken to prevent the erection, on low-lying flooded lands along the river bank below the city, of buildings of every kind, and also of structures that would retard the flow of flood waters. Of course owners would require compensation, but by adjusting river frontages in some cases I presume the amount that would be required would not be very large ; any way, it should be borne in mind that land values increase as years roll on, and possibly land could not be obtained cheaper than now (1896, p. 13).

Then in 1899 the government brought out a British military civil engineer from India, Colonel John Pennycuik. Working with Henderson, he reported in November 1899 (Pennycuik 1899). He agreed with many of Henderson's suggestions but because he was concerned with flooding affecting the river upstream from Brisbane as well as in the city itself, and because he used different assumptions about the maximum discharge capacity of the river, his major recommendation was the construction of a single flood water retention dam below the confluence of the Stanley and Brisbane Rivers (in fact, just a few kilometres upstream from the site of the present Wivenhoe Dam), a site he says was suggested by Henderson. It is interesting, though, that Somerset in 1913 said that he had wished to take Pennycuik when he inspected the river to see possible sites for other flood reduction weirs on the Stanley and Upper Brisbane Rivers in 1896, "but as he had gone out there for a certain purpose I had to return him to Esk without going to either of these places" (Somerset 1913, p. 360). This implies a limited brief for Pennycuik's investigations, and in fact the first flood abatement dam built was on the Stanley River (completed in 1959) and named after Somerset.

Pennycuik did make the prescient observation that although he recommended a certain scale for the dam, based on his calculations of the size needed for flood abatement, a larger dam could be built to allow for "the possibility of the reservoir being used in future for purposes of irrigation" (1899, p. 6), an extension that he supported. However, he is adamant that the two purposes are quite distinct and involved competing interests, so he felt the reservoir should be emptied as far as possible before the rainy season and although the abatement of floods is "an object of general interest, the cost of which may be legitimately met from general revenue" the utilisation of water for irrigation "is a matter of purely local interest, and any additional expenditure with the object must presumably be met, or the interest on it paid, by those interested" (p. 7). A similar scheme (though proposing several smaller rather than one large reservoir) had been proposed in 1890 (Cox 1899, p.7). But nothing came of Pennycuik's suggestions. In his parliamentary Address in Reply in July 1900, Hon E. B. Forrest noted that, "Colonel Pennycuik has been and gone, his report has been before the Government for some twelve months, and we are told that they are still considering it" (Forrest 1900, p. 138). This is despite the fact that the question of floods had, ever since 1893, "been before the Ministry of the day, deputation after deputation has waited upon them, and pointed out what ought to be done..." (Forrest 1900, p. 138). A similar reference to lack of government action was made in parliament by Somerset himself as late as 1913 (Somerset 1913, p. 360).

One long-term land use change eventuating from the 1893 floods was the purchase of the Orleigh Estate in West End/Hill End and its conversion into public open space. Many, but not all, of the houses were washed away in 1893. The Hill End Progress Association pressured the South Brisbane City Council to buy the estate and turn it into a park. There was general support for the idea because "the area was too low-lying to allow homesteads to be erected thereon" (*Brisbane Courier* 1916, p. 5). It was eventually purchased by the South Brisbane City Council for £1200 and opened as a park on 25th August, 1917 (*Brisbane Courier* 1917, p. 9) although beautification and upgrading were delegated to the local community.

1925 and all that

A major change in metropolitan Brisbane occurred in 1925, with the implementation of the 1924 *City of Brisbane Act* through the amalgamation of two cities, six towns, ten shires, and parts of another two shires into a single 971 square kilometre "greater" Brisbane (Greenwood and Laverty 1959, Minnery 2004, 2014, Minnery and Wilson 2008). The discussion preceding the amalgamation, whilst it covered a wide range of local government activities and responsibilities, did not refer to the possibilities for flood abatement by the enlarged, more effective local government. There were many references to better, more efficient and coordinated town planning. But whilst there were frequent references to matters such as roads, sewerage and drainage, these were most often in terms of the parochial local boundary problems that would be overcome through unification (Greenwood and Laverty 1959). By

implication flood control or mitigation was not seen as a local government responsibility; it was vested in state government, presumably as state government controls (and still controls) the river and its bed below the high water mark. Local authority controls (including town planning) apply only above the high water mark. Yet as Godber notes, "floodplain management in Queensland has traditionally been a local government responsibility" (2005, p. 22). There is continuing confusion between management of the uses on the floodplain and mitigation efforts that are focused on the river itself, especially in terms of the institutional levels of responsibility, a confusion that existed as late as the 2011 floods (Grigg 2011). Henderson had identified the need for control of structures and activities in low-lying areas as early as 1896. But a system for controlling land uses was slow to arrive. An even more hesitant arrival was a full town planning system.

An early action by the newly elected Brisbane council was, in 1925, to appoint its first town planner -- W.A. Earle (Low Choy 2005). The town planning department initiated a civic survey as a basis for a town plan, but the Great Depression intervened and in 1931 the town planning department was abolished. A new city planner (R. A. McInnes) was appointed in 1935 and a Town and Home Exhibition, showing the need for a planned city, created in March 1944, then a Town Plan Exhibition as the basis for a new plan set up in April-May, 1948. Neither of these exhibitions mentioned the flooding danger to the city, although that of 1948 references 'low lying land' and the need to fill it because of mosquitoes and other pests (BCC 1944a, 1948).

Yet floods and flooding had remained a problem for Brisbane and there were a number of interests pushing for something to be done, but the institutions involved were struggling over responsibilities and resources. There was a serious flood in 1931. In 1932 the Lord Mayor (Alderman J. W. Greene) suggested to the State Premier (W. Forgan Smith) that a board should be appointed to recommend a scheme for flood prevention in the metropolitan area and to suggest what proportion of the costs should be borne by which authorities (*Brisbane Courier* 1932, p. 14). A Brisbane Floods Prevention League (which included representation from the Town Planning Association) had been inaugurated in early 1929 and strongly supported such a board and scheme (*Brisbane Courier* 1929). Local residents from areas subject to flooding also clamoured for flood prevention schemes -- one made up of residents along Breakfast Creek held a noisy meeting involving Brisbane Aldermen and a State MLA in March 1934 (*Brisbane Courier* 1934, p. 16). So in the lead-up to the appointment of the second town planner to the city, and only a decade before the 1944 planning exhibition, agitation for flood prevention was part of the policy agenda for both the Brisbane City Council and the Queensland government. In addition to this, construction of the Somerset Dam on the Stanley River was started in 1935 partly as an employment generator and partly as a flood mitigation and water storage measure (although its construction was interrupted by World War II and it was not completed until 1959)(SEQWater 2013a). In other words, flooding was widely recognised as a problem. It was also recognised by some as a matter that should not be left just to engineered mitigation works. Powell (2015, n.p.) quotes a concerned 'Queenslander' who wrote to the *Brisbane Courier* in January 1927, "observing that because of the regularity of floods prior to 1893, people were taught to 'shun' low-lying areas close to the river. The last major flood had been in 1908, by which time the danger had been forgotten and the sale of allotments and development had 'gone on at an unprecedented rate.'" This observer recognised the need for some kind of control over land use in floodable areas (as did Henderson in 1896), but the town planners of the 1940s did not.

The struggle to gain effective control over land uses and land development in Brisbane, including restrictions on use and development such as could be used to reduce the impacts of floods, was long and complicated. Brisbane started a civic survey in 1928 in preparation for a zoning scheme which was created in 1929 but the state government refused to endorse it (Cox 1968). Council passed ordinances in 1926 (controlling subdivisions and including a building code), and 1928 (enabling residential districts to be declared) which remained in effect until the 1950s (Cox 1968, p. 36). Council developed another scheme using the procedures set out in Section 33 (town planning) of the consolidated *Local Government Act* of 1936. This scheme was adopted in 1944 but not forwarded to state government (state government said it had no legal standing but Lord Mayor Chandler claimed his advice was that it was legal once approved by council (BCC 1944b)). Council then continued to amend this draft scheme using procedures of dubious legality based on the 1926 and 1928 Ordinances. A revision of the 1944 scheme was started in 1947. One of the first moves in relation to the town plan by the new Labor leader in 1952, Mr F. Roberts, who "was confronted with a nearly completed town planning scheme which had been in preparation since 1935" (Cox 1968, p. 54) was to ask the state government to validate the irregular preparation of the then current zoning scheme. The result was the *City of Brisbane Amendment Act* 1952. This produced a valid land use zoning system (based largely on existing uses) but no proper town plan. The map illustrating the 1952 scheme

identified "Open space reservations" along one side of the river from South Brisbane to Fairfield (BCC 1952).

The eventual first full statutory town plan for Brisbane, under the *City of Brisbane Town Planning Act 1964*, was promulgated in 1965. According to Doss (2011) the 1965 plan included 'Drainage Problem Areas' declared by resolution and mapped as an appendix to the plan. These included land affected by floods but also low-lying areas and areas that were difficult or expensive to drain. The 1978 revised Town Plan followed the major flood on January 1974. A whole raft of flood-related provisions were included: defining areas subject to flooding on the basis of the 1974 flood levels; a requirement for Council permission to develop on 'Areas Subject to Flooding'; a policy identifying the level required for habitable floor levels; as well as planning and building controls relating to habitable floor levels. Later town plans have each included specific provisions to mitigate the future impacts of flooding (Doss 2011). Local government planning for floods in Brisbane had arrived.

The role of the state government, though, was still ambivalent. It had a strong role in emergency management. It played a major role in the construction of two flood abatement dams: the Somerset Dam and the Wivenhoe Dam. Wivenhoe's role in flood mitigation became quite controversial as a result of the 2011 floods. One submission to the Queensland Flood Commission of Inquiry (QFCI 2011, 2012) said that the floods were at least partially a "dam release" flood (ICA 2011, p. iv). Perhaps the strongest connection between the dam and land use planning was in terms of public perceptions of its likely impacts on flooding in Brisbane. Recent research by Kammerbauer and Minnery (forthcoming), who interviewed households which were flooded in 2011, showed there was often a perception that the dam would prevent flooding as severe as that in 1974 as well as a belief that Council would use its regulatory powers to prevent new developments in areas that would be flooded in the post-Wivenhoe regime. Post-Wivenhoe community expectations were not managed as well as they could have been. The Premier's instruction to release water from Wivenhoe to increase its flood retention capacity in the 2013 moderate flood event demonstrates some of the potential for State government influence. Because of its role in the creation and running of the Port of Brisbane it is also responsible for the continued dredging of the river. But in terms of the linking of urban planning with flood mitigation it was silent, at least until 2003 when it introduced State Planning Policy 1/03 *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide* (DLGP & DES 2003), a policy that local governments were required to incorporate into their town planning schemes (Browne and Minnery 2015). This hazard-specific policy was repealed in 2013, however, and rolled into a single integrated State Planning Policy, effectively downgrading the way that planning schemes deal with floods.

Conclusions

What roles have ideas, interests and institutions played in the long, on-going saga of Brisbane and its floods? And what lessons are there for other cities?

Firstly the presence and influence of ideas. The history of flooding in Brisbane illustrates clearly that ideas can wax and wane. Immediately after each flood a whole raft of ideas about mitigation crowd the public agenda. Yet as time goes on the concerns diminish, particularly if there are competing ideas, such as finding a place to live or making a profit from the sale of land. And values about the status of the river can change, as when in the 1980s the river changed from being an easy place along which to build freeways to become the cultural focus of Brisbane, the 'river city'. Hazard mitigation efforts in any city and for most hazards need to be cognizant of the fluctuating status of ideas. Similar concerns have been expressed in other states about the loss of community memory after disasters (Hussey and Pittock 2013).

Interests are closely tied to ideas. In some cases they support ideas about flood mitigation (such as the rise of the Brisbane Floods Prevention League) but in other cases the competing interests may lead to stagnation (such as the debates about how to control the Brisbane and Stanley Rivers after 1893). The conflicting interests involved in the many competing uses of the river also stymie implementation of many proposals: are dams to be used for flood abatement, or irrigation, or urban water supply? And how will flood mitigation affect transport on the river? Identifying the competing interests and working with them clearly should be part of any serious mitigation strategy. In modern terms these include the development industry and residents in currently flood-prone areas as well as the water supply, recreation, transport and civic (and now environmental) interests with a stake in the future of rivers in any Australian city.

Institutions become involved when authoritative action is needed or resources have to be committed. Although some informal institutions were also often involved, in Brisbane's case a critical element was debate about the level of government that had the responsibility for taking action. Formal institutions often have the power to give or withhold resources. Pennycuik's scheme of 1899 died because of the reluctance of the Queensland government to commit the money needed. The parliamentary debate on Supply in the year 1900 spent some time arguing whether local governments should assume the responsibility for flood abatement on the Brisbane River, or whether it was a colonial or national responsibility (QPD 1900, p. 2813). It was not until the 1930s, when the idea of such a holding reservoir could be tied to water supply and drought protection (and used as an employment generator) that a dam would be started. Linking flood mitigation proposals to other proposals that can easily gain the support of resource-allocating institutions may also be an appropriate strategy in other cities.

The formal institutions of town planning have taken a long time to recognise the critical links between flood mitigation and land use. Ordinary citizens have shown that they were aware of the problems that would result from building in flood prone land; but the early planning system was more concerned with matters like city beautification and traffic. It was only very slowly that the power of land use controls was recognised as something that could be harnessed to help reduce the impacts of floods. Increasingly post-disaster inquiries across Australia are pointing to the potential benefits of using land use (and building) controls to help mitigate the impacts of future disasters (e.g. QFCI 2012, VBRC 2010).

The ideas-interests-institutions framework provides an effective tool for mapping the developing but hesitant relationship between urban land use planning and flood management in Brisbane over the period from 1890 to the present. The trajectory has been shown to be tentative and uncertain as it appears to have been in other states of Australia. But for Australian cities to prosper their future development should be protected to as great an extent as possible from the impacts of natural hazards, including floods. Understanding the impacts of ideas, interests and institutions over time provides a good starting point for the development and implementation of effective urban policies relating to flood mitigation.

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