ENSURING THAT EMERGENCY MANAGEMENT IMPERATIVES ARE MET IN THE FLOODPLAIN RISK MANAGEMENT PROCESS: A VIEW FROM NORTH OF THE MURRAY

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Presenter's Profile

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MANAGEMENT PROCESS: A VIEW FROM NORTH OF THE MURRAY

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Abstract

By developing sound practices to manage floodplains and protect flood liable communities, New South Wales has built a proud record of achievement in reducing the flood threat. Only in relatively recent times, however, has the emergency management community been purposefully built into the processes of floodplain management by which decisions are made on land uses and flood mitigation measures. Nowadays the NSW State Emergency Service, as the legislated 'combat agency' for floods, has a role in council-led deliberations about the management of flood prone environments, but difficulties have been experienced in terms of relationships with developer interests, floodplain management consultants and council officers and at times the emergency management interest has not been well addressed. This paper deals with the issues with which the SES has been confronted in its endeavours in the field of floodplain risk management, and the gains it seeks by being involved.

Key Words: floods, floodplain risk management, emergency management

Introduction

In NSW, as in the other states of Australia, the State Emergency Service has a leading role in the management of flooding. How this role has been interpreted has evolved over time, and with the changes of interpretation have come different approaches to the task. Little more than a decade ago the SES saw flood management as being confined very largely to real-time response: there was little preparatory work in terms of planning for the 'response moment', and very little networking with other agencies outside flood time to maximise the quality of that response. Nowadays things are very different. The SES makes a considerable investment in flood planning, seeking to anticipate the problems which flooding will bring and to devise optimal solutions ahead of time. It also maintains close contact with the Commonwealth Bureau of Meteorology in relation to the flood warning task, with the Dams Safety Committee (the regulator of water storage dams in the state) on cases of potential dam failure, with the Department of Community Services on the management of evacuees, and with councils of local government on a variety of flood-related matters. Beyond this agency-oriented networking the SES is doing much more than it previously did to educate the members of flood liable communities about the flood risk, the management of it and what individual people should do to be ready for the inevitable flood moment. The SES's flood management role has been considerably deepened and broadened in recent years.

Part of the change has seen the organisation become more closely involved with councils in relation to decisions on the utilisation and management of flood prone land. By law, councils are consent authorities in regard to land use decisions, and in NSW they also play a significant role in decisions about and investment in flood mitigation. Until quite recently it was rare for councils to seek advice from the SES about planning matters or about flood mitigation, but during the 1990s this began to change. Nowadays, councils often seek SES input to decisions about proposed developments and involve local SES volunteers in Floodplain Management Committee deliberations on the nature of local flood problems and the means by which they can be managed. This paper explores the SES's increasing involvement in matters relating to floodplain management and draws lessons from its interaction with councils in this field.

Building Emergency Management Considerations into Floodplain Management Processes

Approaches to the SES began with councils seeking the input of the SES on decisions in relation to the consent role. These approaches carried with them the recognition that the SES could provide useful advice on the public safety and property protection dimensions of proposed developments. In essence, the SES was being seen as able to assist councils in the discharge of their land use management responsibilities.

The increasing participation of the SES in these matters created both opportunities and problems for the SES, and it became necessary to formalise the involvement so that the problems could be managed effectively and the opportunities maximised. One of the problems that soon emerged was that councils seeking SES help usually went directly to SES Local Controllers for advice. Given that these controllers are volunteers whose expertise does not necessarily encompass the specialist field of floodplain management, the possibility arose that poor advice would be given or none at all. Moreover direct approaches from councils to controllers ran the risk of controllers losing council support for themselves and their units if there was disagreement on the merits of a particular case. Equally, controllers risked antagonising development interests, finding themselves in situations of conflict of interest, or being required to appear in the Land and Environment Court where they could be cross-examined about complex matters relating to warning and planning policy, present and future SES rescue and evacuation capabilities, and the setting of precedents about potentially unsafe developments on floodplains. These matters are often legally complicated and politically fraught, and a case can readily be made that volunteers should not have to be caught up in them.

Noting the risks involved in the situation, the SES sought to discipline the process. This was necessary to ensure that the advice tendered to councils was properly considered and was provided by people with appropriate expertise. It was also necessary to protect local volunteers from the complex politics and court hearings sometimes involved. From 1997 SES Controllers were directed to refer council queries to State Headquarters where the necessary expertise could be found and developed, appropriately distanced from particular cases under examination but in close contact with other government agencies such as the then Department of Land and Water Conservation (the state agency with responsibility for floodplain management matters generally) and the then Department of Urban Affairs and Planning (the state government's planning authority). These agencies have since been incorporated into the Department of Infrastructure, Planning and Natural Resources.

Staff input became necessary, therefore, and in due course it expanded beyond the simple provision of advice. Inevitably, some councils sought to have SES staff appear as witnesses in cases of appeals against council decisions on proposed developments. Others asked staff to brief councillors about emergency management matters as they related to decisions about the utilisation of land on floodplains.

Numerous matters relating to the management of floodplain land are now referred to SES staff at state and division (regional) level, and a body of expertise has been built in dealing with them. Importantly, the SES is now able to provide councils with well-considered, quality advice on matters such as property protection on floodplains and on evacuation management considerations. It is also able to help councils deal with public safety questions relating to evacuation and rescue capability in cases which are subject to appeals in the Land and Environment Court.

The SES's role in floodplain management matters has been formalised in other ways, too. In recent times the SES has been formally and routinely incorporated, at the volunteer level and with staff where appropriate, on the committees which steer the floodplain risk management process at council level. These committees are central to decisions about land management on floodplains and about the mitigation of the flood problem.

The NSW floodplain risk management process has been lauded by independent observers as being close to international best practice in the field (see, for example, Smith, 1999). Being actually **on** these committees when they are formed has been of great benefit to the SES: again, it helps ensure that emergency management considerations are properly taken into account in the deliberations, and it also gives the SES an opportunity to seek information of direct relevance to its roles in relation to flood preparedness and response.

In particular, the consultant studies which are steered by the floodplain risk management committees can be oriented in part to the compilation of 'flood intelligence' about the sorts of flood conditions to which operational responses might need to be made in relation to warning, resupply, evacuation, property protection and other functions.

Quality response decisions about tasks related to these functions cannot be made without good flood forecasting systems (which are provided by the Bureau of Meteorology) and good flood intelligence. Notwithstanding the considerable improvements made as a result of data collected during flood events in recent years, there remain many gaps in the SES's flood intelligence records. In some areas the effects of frequent, low-level flooding such as the locations of road closures and the extent of farmland flooding are known with some precision but the consequences of rarer, more severe events are not. Elsewhere the impacts of urban inundation have been documented but the nature of the consequences of flooding outside the towns has not been well captured.

Of particular concern is the lack of recorded information about the consequences of severe floods – that is, the large ones which occur only infrequently but which have very serious consequences. In terms of safety issues, their principal consequence relates to large-scale evacuation: there are numerous river valleys in NSW, especially but not exclusively those to the east of the Great Dividing Range, in which the numbers of people who will need to evacuate in severe events runs into the thousands or tens of thousands. These include the valleys of the Georges, Hawkesbury, Hunter, Macleay, Clarence and Richmond rivers. There is a real need to quantify the likely scale of the evacuation operations which will need to be mounted and to understand the complexities related to the time which will be available, the routes by which evacuees should travel, and the reception, accommodation and other welfare-related issues which will need to be managed.

This unevenness of intelligence coverage, especially in the context of the more serious events, is problematic. It means that response decisions must often be based on guesswork because the likely consequences of the coming flood are not understood even if the height it will reach at a specified gauge has been forecast. Yet the gaps in knowledge are relatively easily filled to a sufficient degree for appropriate decisions to be made if the right questions are posed by consultants. These questions are about the heights, on relevant gauges for which the Bureau of Meteorology provides flood warnings, at which flood waters encroach upon specified farmlands, caravan parks, residential properties, business premises, community facilities, institutions and utilities within the reference areas of these gauges (and noting, where appropriate, the approximate heights at which buildings are flooded over their floors). Likewise, the heights at which roads and railway lines are cut at specified locations, airfields are inundated and levees are overtopped are of great interest. For further specification of the data which is needed for operational decision making as floods are rising, see Emergency Management Australia (1999, 15-18).

Tapping in to the floodplain risk management process has great potential benefit to the SES in relation to its own flood planning responsibilities. At little if any cost, the consultant studies can be made useful in a context beyond the council land use planning one. Indeed, the SES sees both floodplain risk management planning (a council responsibility) and planning for actual flood responses (an SES one) being strengthened by an integration of what are essentially parallel and mutually supportive processes. We have, in fact, re-cast the original floodplain risk management process, as indicated in Figure 1 which fully incorporates the accepted present process (top line) while adding a second line to it and indicating the potential interactions between the two sets of concerns.

This reconfiguration has not been formally adopted in the state's floodplain risk management documentation, but its utility in creating an understanding of the links between the two processes is clear. The SES is working with the Department of Infrastructure, Planning and Natural Resources to formalise the integration in terms of the SES's needs for flood intelligence (McLuckie and Opper, 2003): better and more complete intelligence is crucial to decision making and to planning in terms of warning, evacuation and other tasks. A clearer integration of the processes, as proposed in Figure 1, would also help councils to comprehend the SES's needs and the benefits which will flow to the general community from meeting them.

The benefits for the SES of formal involvement in the floodplain risk management process go beyond those relating to the collection of useful data. Membership on floodplain risk

management committees provides SES volunteers with an opportunity to learn about their local flood problems and to enhance their thinking and planning about the management of those problems in 'planning time'. This is especially important given that flooding is not a frequent occurrence on the state's rivers and many senior SES personnel have had, through no fault of their own, little or no flood management experience. In fact in six of the eighteen SES divisions there has been no riverine flooding to manage (that is, no floods reaching designated 'minor flood' levels at key warning gauges) since 1996 or before. In most instances there has been no severe flooding, necessitating evacuations, for even longer in these divisions. Participation in the floodplain risk management process creates an opportunity for 'synthetic' learning in the absence of or to bolster actual experience, and to consider flood management issues in the company of others with interests in them – consultants, council officers, community representatives and state government personnel (including SES staff where appropriate). The educational benefits are considerable.

SES involvement in floodplain risk management has helped bring emergency management considerations to the fore. This has especially been the case in the valley of the Hawkesbury-Nepean River on Sydney's outskirts, where a repeat of the record flood of 1867 would in today's environment require the evacuation of some 40,000 people. The report of the Hawkesbury-Nepean Flood Management Advisory Committee (1997) identified the great difficulties associated with large scale evacuation in the valley and, to deal with them, proposed substantial spending on improving the road system. The aim was to ensure that people can be evacuated successfully on the rising limb of a severe flood which threatens to trap people on 'shrinking islands' capable of being fully submerged in an event peaking well below Probable Maximum Flood level. The committee's proposal was accepted by the state government, and in the past five years more than $100 million has been committed to the construction and raising of evacuation routes out of Richmond, Windsor and other communities along the Hawkesbury-Nepean River. Difficulties associated with evacuation have also been to the fore in considerations about new residential development in the valley, notably in the Penrith Lakes, Pitt Town and Windsor areas.

The evacuation route problem – roads out of floodplains being cut by flood waters, leaving people trapped and in danger if the water rises high enough to inundate their floors, sometimes to considerable depths – is a serious one in NSW. Research commissioned by the SES on caravan parks on floodplains has shown that many lack good evacuation routes (Yeo, 2001), and the SES's flood planning has uncovered several cases of communities whose evacuation routes are lost at relatively low levels. These levels are well below the heights at which flooding produces serious consequences for those who are trapped. The potential for large numbers of deaths to be caused during floods in these environments is high.

Some Lessons from the SES Involvement in Floodplain Risk Management Processes

The SES has welcomed the opportunities which participation in council-led floodplain risk management processes have provided. Some problems have been experienced, however, and lessons have had to be learned about how the participation should be managed.

To begin with, councils differ greatly in their application of floodplain risk management processes and there is considerable unevenness of practice from council to council. On occasions the SES has not been made aware of the formation of a local floodplain risk management committee or it has been excluded from it. Sometimes, too, we have had difficulty in obtaining copies of the flood studies, floodplain risk management studies and floodplain risk management plans as they have been completed, and as a result we have not been able to use these resources to re-evaluate or augment our flood intelligence records or our flood plans. Not all councils, it seems, welcome our participation – but to exclude the SES and deny it learning and data-gathering opportunities is likely to reduce the organisation's ability to respond effectively when flooding occurs. This is surely not in the interest of councils, which after all have clear responsibilities in relation to community safety, because it carries the potential to compromise that safety.

There have been cases, too, in which councils have not understood the SES's role, and these have caused confusion. It is vital that consultants be accurately advised in tender documents of the SES's role and potential

contribution so that conflicting planning processes are not set up or that consultants are misled about the emergency management arrangements which apply. In one case the consultants who tendered for the contract were asked to formulate a 'flood warning and evacuation plan' for flood prone areas of the council area. This was problematic given the SES's statutory duty as the combat agency for floods to prepare this very kind of plan. The prospect was raised that competing plans – one written by a consultant and with questionable legal status in terms of the State Emergency and Rescue Management Act, and one written by the SES possibly without consultant-provided data – might have been produced in isolation from each other. The resultant confusion would have created serious difficulties when a flood response operation had to be undertaken. Council and the local SES would have acted in different ways, and public confusion would almost certainly have been engendered.

Far better would have been for the tender document to seek not the **production** of a plan per se but **input** from which the SES could lead the emergency planning as the legislated combat agency and the organisation responsible for the coordination of agency and community responses when floods occur. If the emergency planning work is done by consultants, it is likely that there will be no understanding of or commitment to the plan by those who have to 'operate' it during the response moment – that is, the SES and the other agencies involved in the flood response.

Flood planning and flood operations work must be linked, therefore. The consultant can be helped to create the linkage only if he or she is properly briefed on the process and if that process is designed to educate the flood planners and responders. If all the work is done by consultants and councils and without consultation with the SES, the SES will not become properly attuned to its task and the likelihood is that it will operate purely in reactive mode when flooding occurs because it has not had the chance during its planning to come to grips with the flood problem and to devise the most appropriate ways of dealing with it.

In short, councils need to ensure that the SES's role, practices and needs are properly understood by their own officers and by the consultants they engage. Several cases have been noted in which this understanding has been flawed, resulting in recommendations in draft floodplain risk management plans which cut across the SES's role or its normal practices – for example in terms of the areas for which flood plans should be prepared. The SES's standard, to ensure document manageability and a high level of within-operation coordination of responses, is to prepare single plans for whole council areas. These have appropriate area-specific annexes if necessary, but we prefer not to develop separate plans for parts of council areas since this could lead to a multiplicity of documents for an individual council's territory and create operational confusion. Another case of flawed understanding about appropriate practices surfaced when a consultant from outside NSW dealt with a local flood problem in the context of emergency management arrangements applicable to his own state rather than to NSW.

Several other cases which have arisen recently involved councils seeking to have a flood plan written despite the fact that this task had already been completed. In these instances the councils were unaware that the SES had prepared the relevant plans some time before: as the chairs of the Local Emergency Management Committees which endorse these plans, councils need to do their homework and avoid making recommendations to do things which have already been done.

What all this means is that councils and consultants should not 'go it alone' in steering the process but should ensure that there is appropriate conferring with the SES and comprehension of its practices and any planning work which has already been done. Lack of consultation is likely to result in poorly implemented solutions which lack quality control and appropriate standardisation and fail to take account of prior experience gained elsewhere. It also wastes time when the problems it creates have to be rectified.

Some of the greatest difficulties experienced by the SES are the tendencies of some councils to seek SES involvement at inappropriate levels and/or at a late stage in negotiations over proposed developments. The SES has relatively limited planning resources and cannot engage in the review of large numbers of development applications for individual small blocks of land. Our best contribution is in relation to strategic instruments such as floodplain risk management plans or development control plans, not via case-by-case assessments. When the strategic implements are

established, properly focussed on the whole floodplain, individual development applications can more easily be dealt with by councils without a need for further SES involvement.

For councils not to focus on the whole floodplain in their planning work also encourages the setting of unfortunate development precedents. One or two more houses on a floodplain may not make a significant difference to the SES's capability in terms of rescue or evacuation operations, but they could open the gates to many similar developments occurring in a piecemeal fashion and creating a considerable cumulative impact. Serious problems of response capability could result. In this context it should be noted that the SES's ability to act, for example to provide warnings by doorknock or to manage evacuations (both of which are labour-intensive activities), does not automatically grow to meet the needs of a growing flood liable population. In any case the SES does not appreciate its capacities being assumed to be available for the purpose of overcoming the consequences of poor or ill-advised planning decisions.

Cases have also been noted in which attempts have been made to circumvent the SES's interest or to deal with the process in ways which are ethically problematic. In one instance a developer, having not received a 'desired' answer from the Local Controller in respect of his proposed development, took his concern to the council's Local Emergency Management Committee. This committee proceeded to endorse his proposal. As a result the council approved the development against the advice of the agency which has to manage rescue, evacuation and other emergency-related tasks when flooding is occurring.

Clearly there are legal and ethical issues here. These can be avoided, and time saved in the various processes and deliberations, if the SES is approached at an appropriate officer level and in the early stages of discussions about particular developments. Councils can help by maintaining consistent positions and by not encouraging appellants to seek inappropriate pathways towards solutions which suit the applicants' own interests but which avoid a proper focus on emergency management considerations.

Not all of the lessons which the SES has learnt from being involved in floodplain management processes are about misapplications of these processes by councils. The floodplain risk management committees have been useful forums in which we have been able to raise questions about appropriate standards in the management of issues. We have developed the view that creating elevated dwellings in low-lying areas which are prone to frequent inundation is not necessarily a wise strategy because it helps create a 'vertical evacuation' mentality when people become conditioned by small, relatively non-threatening events and refuse to evacuate in the face of larger, genuinely dangerous ones. Consciously allowing substantial increases in numbers of dwellings in locations which are inherently, if only occasionally, dangerous – especially when even raised floor levels could be inundated – does not equate to safe development practice. It simply ensures that larger-scale evacuation and rescue operations will be required.

This should not be interpreted as meaning that the SES opposes house raising as a floodplain management measure. It does not, but it argues that house raising is best seen as a measure for protecting people's belongings. A disadvantage which partially offsets this is that house raising can encourage a false sense of security whereby people will think they are safe merely because their floors are elevated. Evacuation is therefore discouraged and is more likely to be delayed until a highly dangerous phase is reached in a flood. This is why, in public safety terms, the SES believes that house-raising is best confined to existing developments rather than being an automatic option in new ones.

The SES has also put the view forcefully to councils and in the Land and Environment Court that private evacuation plans, written on behalf of a development proponent, should not be permitted to allow a floodplain development to proceed if it is deemed to be unsafe without such a plan. Such plans purportedly guide evacuation from flood-liable properties, but they are notoriously difficult to keep current and fit for their purpose, and they cannot make unsafe developments safe. Regular revision cannot be required – once the development is allowed it is allowed, and there will be no 'policing' thereafter. The plans cannot be guaranteed to be passed to new owners when properties change hands. The SES does not endorse such plans, and it seeks to persuade councils that too often these documents will be cynically produced to achieve development consent and will then effectively cease to exist.

Private family and business flood management plans are to be encouraged and the SES promotes them vigorously as means of promoting flood readiness. The SES does not believe, though, that they have a legitimate place in the consent context, where they are invariably used to paper over problems rather than to solve them.

Discussion

The SES believes that it has a role to play in the various elements of the floodplain risk management process. Its focus, obviously, is on community safety in the floodplain environment, and its involvement gives it an ability to raise matters which have a bearing on the safety of people and to ensure that these matters are properly taken into account. Formal involvement has given the SES a real voice in terms of the **prevention** dimension of floodplain management. In other words, it helps us to ensure that the problems of development on floodplains are reduced or at least not made worse.

The SES has found that its views have been acknowledged by many councils and taken into account in councils' decisions. As a result emergency management considerations, including the difficulties which attend large-scale evacuations, have been formally built in to a greater degree than previously and a number of councils have come to understand that the flood problem can be more serious in its consequences than it sometimes appears to be. Complacency on this score is difficult to erase, especially when severe floods on a particular river are infrequent, but the fact remains that there have been several floods in NSW history which have caused large death tolls (State Emergency Service, 2001). Such floods will occur again.

When they do, and indeed whenever serious flood damage is caused, community criticism of development practices will be heard and people's anger will not be assuaged by the argument that the flood was a rare 'freak of nature'. Vigilance about high safety standards needs to be maintained and councils need to be reminded that the flood threat is occasionally very serious in terms of the damage it does and the scale of deaths it causes. There is real complacency in the community on this point, and some councillors, council officers and developers share it. It is not widely known that flooding has killed more people in Australia than any other natural peril except heatwaves (Coates, 1996) and causes more dollar damage than any other natural hazard agent (Bureau of Transport Economics, 2001).

In all this it must be said that the SES does not seek to have a role as a consent authority in relation to the use of floodplain land. It is interesting to note that the NSW Rural Fire Service recently took on such a role in the bush fire context, but the SES is not resourced for this responsibility and is not in favour of taking it over or sharing it formally with councils. Naturally, we hope that councils will seek our advice and heed it as well as helping us to improve the quality of our work when floods are actually occurring.

The key message about the SES's involvement in floodplain management endeavours is that councils need to ensure that they communicate well with their strategic partners. To help with this, McLuckie and Opper (2003) are reinforcing the floodplain management processes by developing guidelines about the proper incorporation of the emergency management interest.

Conclusion

The SES believes that councils and the SES alike have benefited from the increased incorporation of SES emergency management interests in floodplain management processes. Councils have been given a stronger appreciation of the emergency management perspective, and SES volunteers and officers have been given learning opportunities and information which will improve their flood planning. Flood liable communities should be the ultimate beneficiaries: in a social sense, floodplains will be healthier places to live if a strong view is taken of community safety considerations in decisions about flood liable land, and people will have wealthier futures if they and their belongings are better protected from the flood hazard. If the SES is given genuine access to council-led floodplain risk management processes, and if there is good communication, like SES will be able to fulfil its core response roles more effectively.

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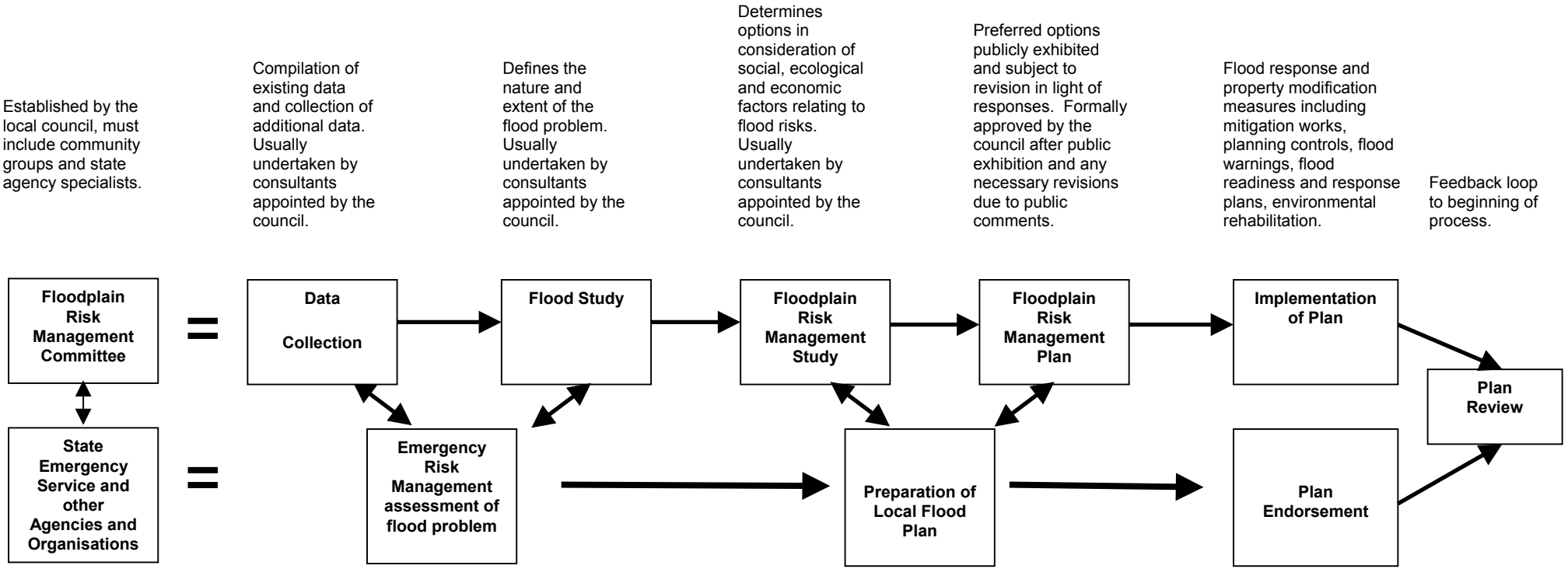
Figure 1: The Current Council-Led Floodplain Risk Management Process (Upper Row) Integrated with the Current SES-Led Flood Planning Process (Lower Row)



Sources: Haines (1996); NSW Government (2001); Keys et al (2003)