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Land-Use Planning For Floodplains In NSW — It's Time To Change The FRM Process

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ABSTRACT: — IT'S TIME TO CHANGE THE FRM PROCESS

It has been over 20 years since the first Floodplain Development Manual was published to guide the management of flood risks in New South Wales. There have been two subsequent versions of the Manual released. While the objectives and general risk management concepts in the Manuals have not substantially changed over this 20+ year period there has been an evolution of management solutions from those with an emphasis on structural engineering to those with an emphasis on non-structural measures, in particular town planning. This evolution has been partly attributed to the realisation that all flood risks cannot be feasibly addressed by engineering solutions and partly due to an increasing rejection of engineering solutions because of environmental impacts.

With the evolution of flood risk management from engineering to planning based outcomes, there has been a failure of the floodplain risk management system to embrace the town planning profession and to produce effective land-use planning outcomes.

The existing system requires planning controls developed during the preparation of floodplain risk management plans to be reconsidered using similar procedures under the NSW EP&A Act before they can be implemented. This dual system approach to floodplain planning creates delays in implementation and leads to inefficiencies. But most importantly, as the floodplain risk management process is usually the domain of engineers, and the EP&A Act process is lead by town planners, often there is a disconnect between the two processes. As a result the resultant planning controls either do not reflect the management study objectives, or even worse, are not implemented at all.

The authors will explore the problems with the existing dual process system and will discuss changes to both processes to allow the better integration of the floodplain management and EP&A Act objectives, and so produce effective land-use planning outcomes for NSW's floodplains.

1. INTRODUCTION

The floodplain risk management (FRM) process in NSW requires decisions on acceptable risks to be made through a merit based process which involves an analysis of the environmental, social and economic context of the study area (floodplain), and the evaluation of options with input from the community before a decision is made by elected representatives. One important outcome of the FRM process is to provide input into the town planning process which involves an analysis of the environmental, social and economic context of the study area, and the evaluation of options with input from the community before a decision is made by elected representatives.

The overlap and repetition in the two processes has lead to lengthy delays in implementation, disengagement of participants, inconsistent outcomes and ultimately a failure to see effective land use

planning implemented on NSW floodplains. This paper poses the following questions: Does this dual process system make sense in principle? Can both processes really do the same thing? Which one prevails where inconsistent? What sort of professional should be responsible for either process? And is there a better way?

2. THE EVOLUTION OF FLOOD RISK MANAGEMENT PROCESSES

A NSW Planning and Environment Commission Circular was issued in 1977 advocating prescriptive floodplain planning controls and the adoption of the 100 year average recurrence interval (ARI) flood standard. This formally marked the commencement of a relatively rigid approach to flood risk management in NSW of simply restricting most development within the 100 year floodplain, consistent with national and international trends at that time.

Public disquiet with the perfunctory process and a realisation that substantial flood risks remained unmanaged by this approach ultimately led to its demise. In 1984 the NSW State Flood Policy disbanded the mandatory application of a singular 100 year ARI flood standard and required local Councils to implement floodplain management policies based on a merit based approach. The first Floodplain Development Manual was published in 1986 to assist Council's in this task.

The Environmental Planning & Assessment Act 1979 (EPA Act), was drafted during the late 1970's and commenced operation in its original form on 1 January 1980 and is the main legislation that establishes processes for the preparation of land use plans in NSW. While various Circulars issue by successive State planning departments recognised the Floodplain Development Manual and mandated that plans prepared under the EPA Act needed to implement the Manual, flood risk management remained a separate process with a lack of clarity of how the 2 processes integrated if at all intended to do so.

With regard to the flood risk management process described by the Manual[1] and depicted by Figure 1, the main components of the process can be categorised into various tasks traditionally performed by town planners or engineers.

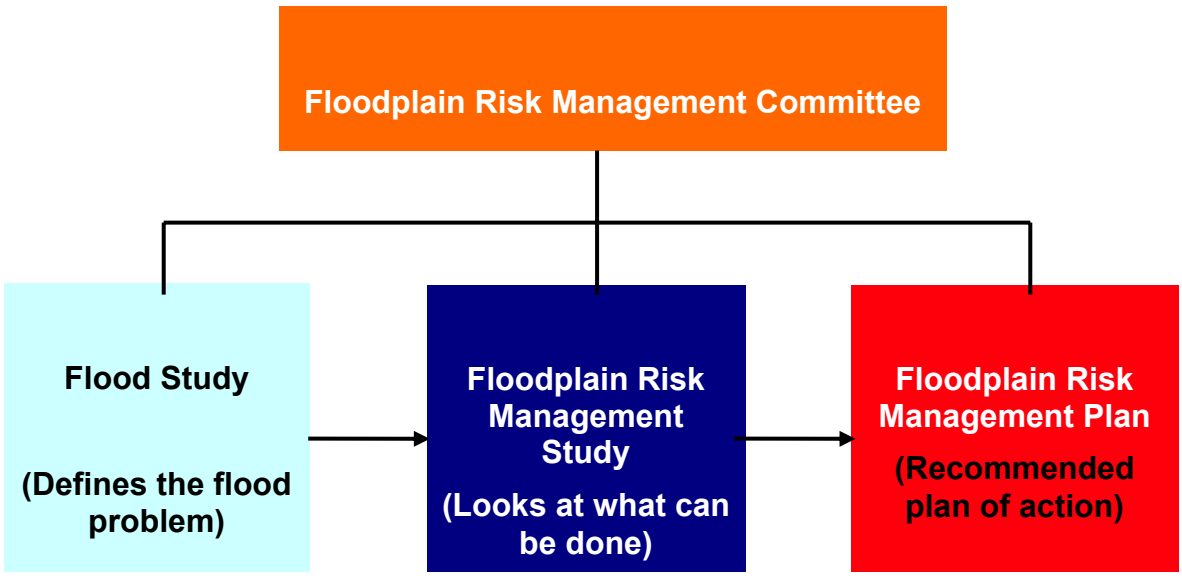

Figure 1: NSW Floodplain Risk Management Process[2]

[1] DIPNR 2005, pg.6-10

[2] Adapted from DIPNR 2005, pg.6

The flood study component remains an engineering task. The Study component is a combination of engineering and town planning tasks. The Plan preparation component (Floodplain Risk Management Process – FRMP), as suggested by its title is a core town planning task. Other professions could also possibly be examined as having requisite skills required to undertake the same tasks but generally these tasks fall into the recognised capabilities of engineers and planners.

3. THE ROLE OF ENGINEERS

Historically flood risk management has been associated with engineering solutions ranging from the filling of land to the construction of dams and levees. Structural integrity in such solutions was integral to the approach of professional engineers and substantial advancement in flood modelling techniques ensued to provide a basis to engineering design.

Within the last 20 years, and in particular since the introduction of the Floodplain Development Manual, flood risk management has evolved into a broad risk management discipline where engineering contributes only in part to the range of possible solutions. The expertise developed by the engineering profession translated without question to the current practice of flood risk management. However, the discipline of flood risk management is now more commonly considered one where engineers only with specialist training and experience are considered to have appropriate expertise.

4. THE ROLE OF TOWN PLANNERS

Traditionally town planners have not been directly involved in the flood risk management process. This process has been considered the domain of engineers partly because of the flood modelling skills of engineers but more relevantly because of an historical focus on engineered solutions to flood risk management. While flooding is recognised by town planners as an important issue in the planning process our unequivocal experience is that there is substantial reluctance by planners to get involved in the flood risk management process or to accept there is a need to do more than restrict development below the 100 year flood extent.

A survey of town planners in NSW revealed that the majority indicated that they were either unaware or only vaguely familiar with the NSW Flood Policy and Floodplain development Manual (57% and 58% respectively). While a substantial proportion indicated they understood the fundamentals of the Policy and Manual (39% and 34%) and some considered they were very conversant with these (3% and 7%) only 12% answered correctly that flood standards in NSW are selected through a merit based process.[3] The majority answered that the 100 year flood was the NSW standard even though this was officially disbanded in 1984 with the next most common response being the PMF.

The lack of understanding of flood risk management in the planning profession can be concluded to be partly a consequence of the lack of inclusion within town planning education in NSW[4] but more fundamentally because of the evolution of flood risk management from an engineering foundation centred on structural solutions. However, the fundamental basis to the NSW flood risk management process is the merit approach defined as follows:

> *"the merit approach weighs social, economic, ecological and cultural impacts of land use options for different flood prone areas together with flood damage, hazard and behaviour implications, and environmental protection and well being of the State's rivers and floodplains*"[5]

[3] Grech & Bewsher 2007. Note the survey was undertaken prior to the Issue of Planning Guidelines by the NSW Government in 2007 that directed local Councils to adopt the 100 year flood for most residential development unless alternative standards are justifiable.

[4] Grech & Bewsher 2007.

[5] DIPNR 2005,pg.23.

The "weighing" of such issues, in particular social, economic, ecological and cultural considerations can arguably be viewed as more relevant to the skills of a town planner as opposed to an engineer. This is not to say that engineers do not have a role or have not performed well. Notwithstanding, the implementation of the flood risk management process in NSW remains principally dominated by engineers with scant involvement by town planners.

5. EXPERIENCES DURING THE LAST 20 YEARS

Having now prepared FRMPs for over 20 local councils, it is our experience that the most challenging aspect has been the formulation and acceptance of town planning recommendations. This is despite recognition early in the projects that town planning outcomes are likely to be the most important.

Various studies have demonstrated that the manner in which different types of land uses are distributed within a floodplain[6] and redevelopment of flood affected older urban areas in a more flood tolerant manner[7] can significantly minimise flood damages in some cases. However there remains a significant reluctance for the town planning profession to engage in the floodplain risk management process.

Planning documents at the local and state level often include ambit statements such as

> *"Councils should ensure that their local strategies, local environmental plans and development control plans maximise the achievement of the principles and recommendations in these policies and plans, in particular: ……*
>
> - *Floodplain risk management plans, prepared in accordance with the NSW Floodplain Development Manual (NSW Government 2005)*
> - *Management of flood liable land under the Floodplain Development Manual*
> - *National Climate Change Adaptation Framework (Council of Australian Governments 2007)…"* [8]

However, planners have a poor understanding of what this involves and there is a genuine uncertainty of how to integrate flood risk management into the planning process. Despite good intentions, such policy statements are in our experience rarely acted on in an effective way, if at all.

The disconnect between planning and engineering is exemplified by the difficulties encountered to settle on standard provisions for current and emerging local environmental plans (LEPs) which have been prepared under the Standard Instrument (Local Environmental Plans) Order 2006. These LEPs (commonly referred to as "Template LEPs") are required to be prepared by every Local Council in NSW over the next few years to provide a consistent structure to the planning system.

There are currently about 12 LEPs either fully or partially prepared in the template form, that have been gazetted, publicly exhibited or have been adopted by the relevant Council. Each of these plans contain inconsistent flood risk provisions and nomenclature (such as something as basic as the definition of flood prone land). Further, definitions of basic terms (including flood prone land) mostly differ from those contained within the Floodplain Development Manual. These inconsistencies are directly contrary to the intent of the Template LEPs and have arisen despite attempts by the Department of Environment and Climate Change and the FMA to assist the Department of Planning in the formulation of standard flood related provisions.

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[6] Bewsher Consulting and Don Fox Planning 1997 & HFMAC 1997

[7] Bewsher & Grech 2000

[8] DoP 2008, pg.43

Practitioners in the FRM discipline need to recognise such outcomes as symptoms of a problematic process that requires significant reform.

6. WHAT HAPPENS NOW – PARALLEL PROCESSES

The Plan making processes under the NSW Environmental Planning and Assessment Act (EPA Act) such as that leading to the preparation of Local Environmental Plans[9] and Development Control Plans[10] (LEPs and DCPs) operate independently to the preparation of FRMPs under the Floodplain Development Manual. While these two processes could be overlapped, it has been the usual practice to undertake the processes separately. The similarity between the two processes is illustrated by Figure 2.

The importance of ensuring the flood risk management process culminates within the planning process was highlighted by the "*Neate*" decision of the Land and Environment Court[11]. In the Neate decision the Court confirmed that the Floodplain Development Manual and Flood Risk Management Plans can be relevant considerations but that Development Control Plans prepared under the EPA Act have supremacy. The implications for example could be a Flood Risk Management Plan prepared in accordance with the Manual restricting certain land uses because of evacuation difficulties would be given less weight where inconsistent with a DCP that facilitates such development. The consequences could extend potentially even further with indemnity from liability associated flood risks being statutorily provided to government agencies based on actions undertaken in accordance with the Manual not planning controls prepared in accordance with the EPA Act.[12]

Normally once the FRMP has been adopted, Council can subsequently implement the recommendations of the FRMP, which may include the preparation of an LEP and DCP under the EPA Act. During this later plan making process further refinement and adjustment to the recommended LEP and DCP can be undertaken. While it could be argued that this does provide for extended opportunities for public participation, the FRMP under the Manual and the LEP/DCP under the EPA Act are effectively identical plan making processes.

In addition, the outcomes of the FRM process can provide further information inputs into the more detail assessment of individual development proposals and more importantly general strategic planning projects. When undertaking studies and preparing plans for a new greenfield residential area or the redevelopment of a shopping centre flooding will often be a relevant consideration together with a plethora of other factors such as transport, ecology, heritage, bushfire, aesthetics and so on. These planning studies are inevitably required to synthesise and analyse all such factors and produce a plan that achieves and appropriate and balanced outcome having regard to economic, environmental and social ideals. In principle, it is the planning process that needs to make the trade-offs between competing considerations – information about the individual factors (including flooding) should not be delivered to the planning process in a state that pre-empts the tradeoffs.

Whilst it is understood that the authors of the Floodplain Development Manual envisaged that detailed strategic multidisciplinary plans would be prepared under the FRM process, the pragmatic reality is that FRM studies do not have the time frames, resources and the necessary involvement of town planning professionals to allow such comprehensive plans to be prepared.

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[9] A Local Environmental Plan (LEP) is a plan prepared in accordance with the EPA Act which defines zones, permissible uses within those zones and specific development standards and other special matters for consideration with regard to the use or development of land.

[10] A Development Control Plan (DCP) is a plan prepared in EPA Act which provides detailed guidelines for the assessment of development applications.

[11] Neat & Shellharbour City Council 2007

[12] Refer to Section 733 of the NSW Local Government Act 1993 which in general terms provides indemnity to Council's and other government agencies and their officers for information provided and things done relating to the likelihood of flooding if undertaken "*substantially in accordance with the principles contained in the relevant manual*"

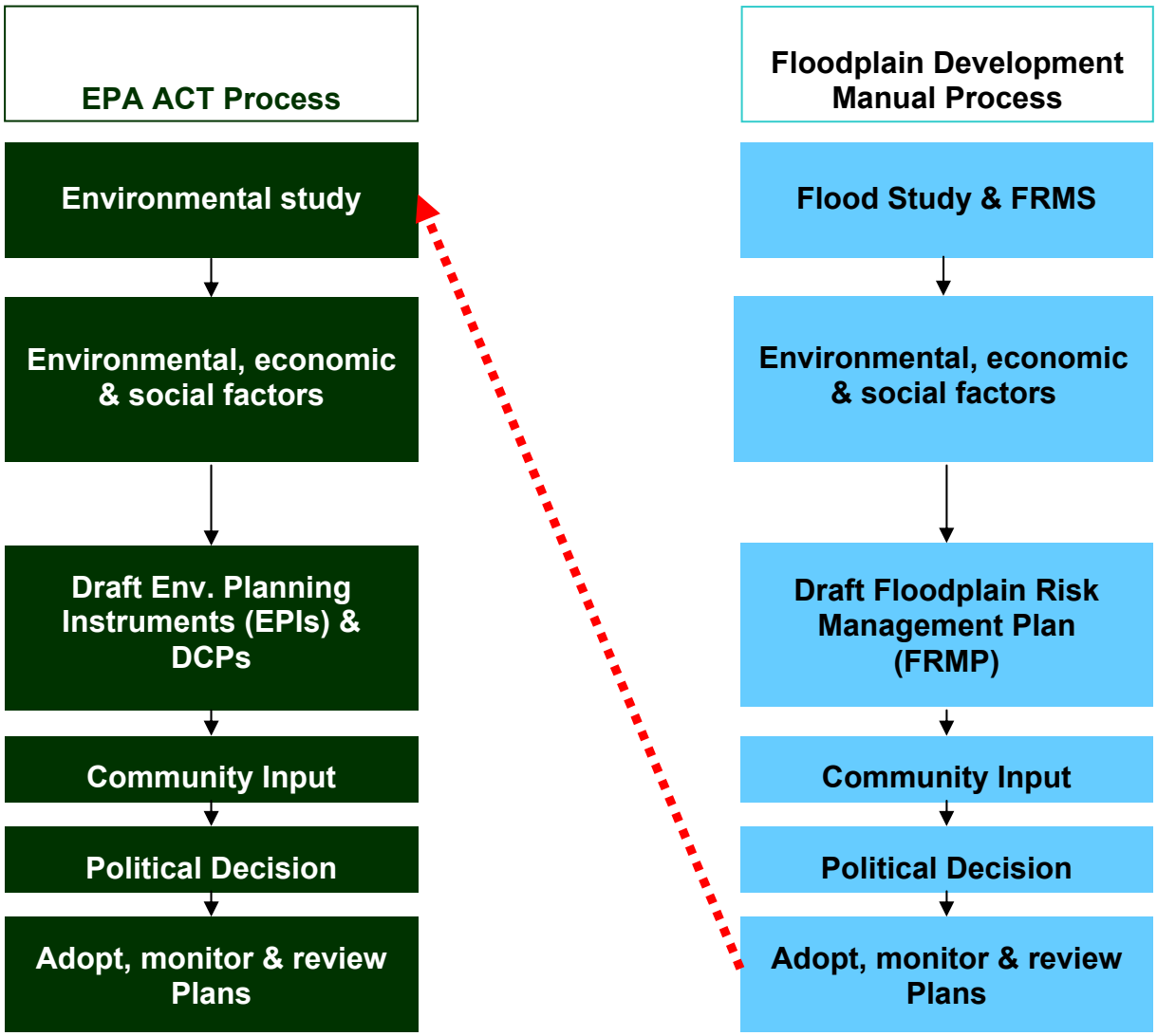

Figure 2: Parallel Flood Risk Management and Planning Processes in NSW

7. DOES THE CURRENT FRM PROCESS MAKE SENSE?

Critical analysis of current practice imbedded in the parallel processes unveils a number of nonsensical characteristics. It is important to reflect on these characteristics and to ask why we do certain things so that flood risk management can progress as a discipline. Some questions that we consider flood risk managers should ask themselves are:

1. Is the flood risk management process simply a typical town planning process requiring consideration of a broad range of environmental, economic and social factors in the formulation of a plan that provides for the balancing of competing considerations?

2. Is it feasible, practical or appropriate to undertake the flood risk management process independently of the town planning process when the ultimate objective is to produce a plan directed towards mitigating flood risk and not necessarily achieving other typical planning outcomes?

3. Do the dual processes perpetuate conflict between engineering and town planning professions and does this at least in part explain the difficulties experienced in implementing the town planning recommendations of FRMPs?

Is it logical that the flood risk management process requires the balancing of environmental, economic and social factors to effectively produce a list of recommendations, in particular flood planning levels, which then feed back into the planning process that will again balance environmental, economic and social factors to produce planning strategies and controls? The requirement of both processes to consider the same factors, produce independent recommendations yet inform each other must inevitably lead to inefficiencies, confusion and inadequate outcomes, which unfortunately is the experience of the last 25 years.

Town planning involves analysing a vast range of often competing issues to produce a plan which technically addresses the issues in the manner which best meets the public interest. Not all issues (and maybe none) may be optimally addressed as the full resolution of one issue may not be appropriate if it conflicts with the achievement of another competing issue. Flooding is only one issue to be addressed in the plan making process and must be balanced with potentially conflicting issues.

The imposition of flood standards that remove all flood risks is unlikely to be acceptable because of the economic and social implications associated with land sterilisation and/or flood risk mitigation construction costs but the imposition of no controls is likely to be equally unacceptable. The decision making process requires a balanced solution somewhere between the two extremes. It is difficult, if not impossible, to reach such decisions about flood risks without having undergone the planning process to determine how important it is to develop land for different uses, in different forms and in different locations. It is similarly difficult (if not impossible) to undertake a meaningful planning process to determine these things without some understanding of the consequent flood risks (as well as other planning considerations).

This is the conundrum that in our view can never be resolved by the dual processes that currently operate.

8. A WAY FORWARD – RATIONALISING THE PROCESSES

8.1. Recognition of the FRM Discipline

The key is an initial acceptance that flood risk management is a specialist discipline that draws on the skills of engineers, planners and like professionals. This will provide the issue of flood risk management an equivalent status to other planning issues, create an expectation for the form of information that is delivered to the planning process and identify to planners and the general community the type of professional that needs to be the source of this information. The form of flood information is one which should allow for a holistic risk management assessment[13] (as opposed to simply a line delineating the 100 year flood extent for example) which is fundamental to the merit based approach to determining flood planning levels.[14]

Risk management generally has been recognised globally as "*a discipline in its own right*" since the late 1980's[15]. In much the same manner that heritage advisors have evolved from architects, planners and historians, and bushfire managers have evolved from foresters, ecologists and planners to be considered disciplines in their own right – so must flood risk managers. This evolutionary process has been spurred by initiatives such as the Floodplain Risk Management Course which commenced operation in 2008 by the University of Technology Sydney.[16]

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[13] As per *AS/NZS 4360;2004*

[14] The form that flood information should take to achieve this outcome in the planning process is a significant issue in itself that can not be explored further within the ambit of this paper.

[15] Smith et al 1996

[16] This Course was initiated and sponsored by the NSW FMA together with the NSW Department of Environment and Climate Change.

8.2. What the FRM Discipline Can Deliver to the Planning Process

Once recognised as a specialist discipline, flood risk management can provide input into the planning process in much the same manner as does other disciplines such as heritage, bushfire, ecology, transport and so on. Planning studies are typically multidisciplinary projects where town planners manage the consideration of a range of issues based on both technical and community input in an iterative process that balances competing interests. This is consistent with the merit based approach of the Floodplain Development Manual.

An argument against combining the processes is that it would be too difficult to implement the merit based approach as part of the planning process, because of the existing complexity of issues in the planning process and the tendency of planners to revert to the perfunctory application of a 100 year flood extent to avoid the more difficult merit based approach. That is, because of the ever increasing complexity of issues required to be considered in the planning process, our experience is that planners desire unambiguous inputs from specialists and are reluctant to engage in an iterative process. In practice, this means that for an issue such as flooding, planners are generally receptive to the mapped extent of the 100 year flood and not a broader body of information required to determine flood planning levels applying the merit based approach. The inclination of the planning process to attempt to embrace all issues equally, without question and without compromise is a matter that requires to be addressed by the planning profession and should not be a reason to resist the formation of an integrated flood risk management process.

A further consideration is whether the planning process is suited only to the management of flood risks associated with future development. Other outcomes of a Floodplain Risk Management Plan such as structural mitigation for existing development, flood awareness and emergency management systems would need to be separately dealt with. While the typical planning process could be modified to be all embracing of the existing flood risk management process, it is unlikely that such fundamental change could be achieved in the foreseeable future or that it would be appropriate. The separation of these elements would not in principle compromise the merit based approach as structural works and community awareness and preparedness are generally evaluated by a separate cost benefit and environmental impact analysis. The division of these processes would not preclude the further consideration of structural mitigation measures in association with the town planning process.

In summary the FRM discipline must review the form of information delivered to the planning process. There needs to be a reconsideration and expansion of the flood study component of the FRM process so that the information it provides to planners is useable and encourages engagement in a merit based approach to FRM within the land use planning process as opposed to expecting that planners do this as part of the FRM process. This will involve creating a more significant role for flood risk managers in the planning process and a diminished role for planners in the FRM process (which in practice has been generally unsuccessful in any case). To achieve these ends both the planning and FRM processes require review

8.3. The Rationalised FRM and Planning Processes

Figure 3 depicts the manner in which the FRM and planning processes could be rationalised and integrated. We do not contend that this is the unequivocal answer but consider that it can contribute to the ongoing and necessary debate of the issues raised above. In summary, the FRM process can involve a simplified FRMP outcome but have an expanded role in the town planning process. This would require the Flood Study to be changed both in the type and format of information it provides to make it more comprehendible to town planners and the general public. This would desirably include a codified procedure for the preparation of flood risk maps[17]. In effect many of the key town planning information needs currently provided (in principle) in a Floodplain Risk Management Study could be produced in a singular Flood Study step, capable of informing the town planning process and the remaining functions of the FRM process.

[17] The production of flood risk maps prepared specially for land use planning purposes, is one way for the FRM process to provide the key information that planners need – refer Bewsher & Grech (2009).

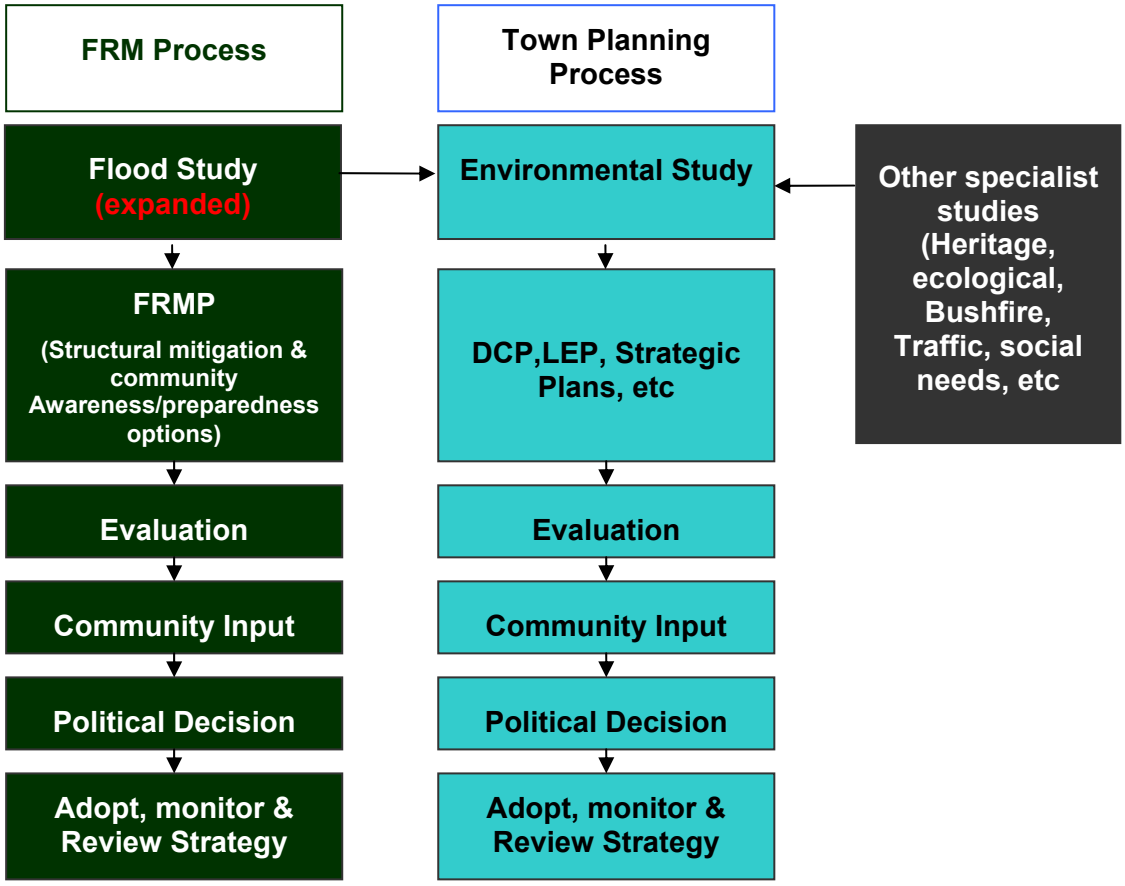

Figure 3: Rationalising the FRM and Planning Processes[18]

The suggested way forward provides for the separation of the activities that deliver the key town planning outcomes (i.e. determination of flood planning levels, strategic land use decisions, and planning controls) from the FRM activities of the Floodplain Management Committee. These activities all involve consideration of much broader issues than flooding and require a balancing of environmental, economic and social considerations. In this way, flooding is treated as a consideration in the planning process in the same manner as other factors and flood risk managers will have a role similar to other specialists (such as heritage experts, ecologists, traffic engineers and bushfire managers).

All of the other activities of the Floodplain Management Committee (e.g. structural mitigation, community awareness/preparedness, etc) would remain. However there would be an expanded role for the Committee to deliver the information package required for a merit based consideration of FRM issues by the planning process.

The Committee would also have a role in the planning process and would be similar to that preformed by other bodies related to Councils such as heritage committees. Some integration between the two processes may remain necessary particularly when the respective plans are in review[19].

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[18] In addition to LEPs, DCPs and strategic plans prepared by Local Councils, the FRM considerations can be made relevant for plans prepared by the NSW Department of Planning, being State Environmental Planning Policies (SEPPs), Regional Environmental Plans (REPs) and Regional and Subregional Strategies to ensure a consistency at all levels of planning. At present the NSW Flood Policy requires FRM to be implemented at the Local Council level only.

[19] For example, adoption of FPLs might require the concurrence of the Floodplain Management Committee.

The advantages of such rationalisation and integration of the processes include:

- Removal of overlap of town planning considerations in determining FRM outcomes.
- An opportunity to codify many of the procedures unnecessarily revisited by individual FRMPs, such as the format of planning controls and flood risk mapping. This would create greater consistency, less inaction due to uncertainty and reduced inefficiencies and associated costs.
- Retracted and simplified FRM process with potential time and costs savings
- A somewhat reduced necessity for input from planners in floodplain management studies, from that envisaged in the Floodplain Development Manual. In reality however, there would be no change to the general level of involvement which currently occurs.
- An increased role for flood risk managers in the planning process.
- Greater opportunity to apply a risk management approach to the planning process.
- Avoidance of situations where FRMPs may be inconsistent with plans prepared under the EPA Act and the consequent potential to void indemnity from liability provided by Section 733 of the Local Government Act 1993.
- A potential broadening of the responsibility for FRM in the planning process from principally local Council's to all agencies involved in the preparation of plans and determination of development proposals under the EPA Act (including the Department of Planning).

Other changes may also be considered, particularly to the Floodplain Development Manual, to incorporate guidance specifically to the achievement of planning outcomes. This could include default standard planning provisions for LEPs and DCPs, together with greater direction on how to apply the merits based approach to FRM issues in the planning process. Default planning provisions would provide clear guidance and recognise the practical reality that most Council's ultimately adopt similar FRM planning controls. Nevertheless this approach should recognise that Council is ultimately required to determine the FRM planning controls appropriate for it's floodplains through an application of the merit approach. The extensive work undertaken as part of the Hawkesbury Nepean Flood Management Strategy and the various Guidelines subsequently produced[20] would provide invaluable input to a revised Manual to explain how to apply the merits approach to the planning process.

8.4. Required Policy & Legislative Changes

To achieve the end of rationalising and integrating the processes a number of critical policy and legislative changes are required:

1. Government Policy will need to make it clear that the key town planning outcomes of the merit based approach to flood risk management are to be implemented through the EPA Act plan making processes.
2. The Floodplain Development Manual will require to be rewritten. The Manual should expand the role of flood studies and specify an information package they are to provide to the planning process. The Manual will need to specify that the FRM process needs to be partly undertaken within the planning process to achieve the outcomes envisaged by the merit based approach. The floodplain management committee will continue to have a role in the FRM process and an added role in the planning process when flood risk issues are evaluated[21].
3. Planning guidelines for the preparation and implementation of floodplain planning controls (using outputs from the FRM process) would need to be prepared and gazetted. These might provide for default planning controls to apply until such time as FRM studies and the associated planning processes had been completed.

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[20] Refer to the 3 publications by the DECC (June 2006) as referenced at the end of this paper.

[21] This would see the establishment of some floodplain management studies and floodplain management committees being driven by Council's planners in order to obtain the information necessary to prepare comprehensive planning strategies. Whilst this should be the current reality, it rarely is.

4. The provisions of the EPA Act and/or Regulation should be amended to give some recognition of the role of the Floodplain Management Committee and the FRM objectives to be achieved in the preparation of plans and assessment of development proposals.
5. Transitional arrangements to provide for the continued recognition of existing FRMPs and gradual phasing in of the new system.
6. Education programs are required at various levels – particularly to provide for specialist flood risk managers and to inform planners of how to integrate flood risk management into the planning process.

These changes could not be expected to occur in the short term but with commitment could be realised over say a 5 to 10 year period. The integration of the processes requires much more debate that can occur within this paper but as a start the above describes a possible way forward.

9. CONCLUSION

The evolution of the flood risk management and town planning in NSW has led to formulation of separate but almost identical processes which ultimately are expected to achieve the same flood risk management ends within the town planning system. The dual processes generally lead to inefficiencies, confusion and inadequate planning outcomes.

The flood risk management process in NSW, generally regarded as world best practice, involves a merit based assessment to determine what flood risks are acceptable to the community. The merit based approach requires the balancing of often competing environmental, economic and social issues.

Flood risk is a basic consideration in the broader town planning process administered in NSW through the EPA Act. However, flood risk is only one factor in many to consider when formulating planning controls and must be analysed within a broad planning framework to be able to determine the optimum planning solution that truly balances, economic, social and environmental considerations in the manner envisaged by the NSW Floodplain Development Manual. To achieve this, the activities that lead to the key town planning outcomes of the flood risk management process must be transferred into the planning process to enable better integration of the two processes.

10. TAKE HOME MESSAGES

1. Floodplain Risk Management has become a separate expertise.
2. The skills required can be drawn from the engineering and town planning professions but specialist training and experience is desirable.
3. The evolution of flood risk management and town planning in NSW has coincidentally resulted in the establishment of similar dual processes required to achieve the same flood risk management ends.
4. The dual processes can lead to inefficiencies, confusion and is arguably a major reason underlying the reluctance of the town planning profession to embrace best practice flood risk management.
5. To redress the inadequacies arising from the dual processes the future must entail the rationalisation and integration of the processes. This would likely involve generational change over a 5 to 10 year period and should start immediately.
6. Fundamentally the changes should involve the transfer of FRM considerations and a greater involvement of specialist flood risk managers in the planning process, rather than to continue with attempting to achieve greater involvement of planners in the FRM process, which in the main has been an unsuccessful struggle over the last 25 plus years.

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