

BEING PREPARED – COMMUNITY FLOOD EDUCATION PLANNING IN NSW

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ABSTRACT

Flood education is any learning process or activity that helps to mitigate the impacts of flooding by building community resilience. It includes program delivery and community engagement activities designed to raise flood awareness and encourage appropriate actions. Flood education has become an increasingly important aspect of flood mitigation as the limitations of structural works in an uncertain future of accelerated climate change are recognised.

The purpose of this paper is to provide a framework for planning community flood education, using examples from NSW.

The paper initially discusses the need for floodplain and emergency organisations to change their approach to flood education from ‘top-down’ information dissemination to one that is based on local community participation, engagement and ownership.

A focus for planning is promoted in the paper focussing on the following four functions of community flood education:

1. Preparedness Conversion. Helping people, organisations (e.g. businesses) and communities commence and then maintain their preparations for flooding.
2. Mitigation Behaviours. Learning appropriate actions (behaviours) - what to do before, during and after a flood.
3. Adaptive Capacity. Learning how to change and maintain systems and build capacities to minimise the impacts of flooding.
4. Post-flood Learnings. Learning how to improve behaviours, systems and capacities after a flood event.

The development of local community flood education plans appears to be one way of formalising and activating the preferred community participatory approach. Although only four flood-prone communities in NSW have developed flood education plans, there appears to be promising signs that they will effectively help their communities prepare for and respond to flooding.

These plans have been developed, implemented and evaluated by local committees usually consisting of resident, rural landholder and business representatives, as well as local council and State government agency staff. Across the four communities, the level of development and implementation of plans has been different dependent on local resources.

The NSW SES can play an important part in local flood education planning by providing expert education advice, engagement tools and a team of local SES volunteers to assist in the implementation of the plan. Local councils can provide detailed local flood impact and mitigation intelligence as technical input to the flood education plans. Local community members can provide their own experiences and knowledge of local networks to help ensure the effective delivery of the plan.

INTRODUCTION

There are three ways to mitigate the impacts of flooding (Department of Transport and Regional Services 2002):

1. *Flood modification* aims to avoid loss by keeping the water away from development. This is the traditional form of mitigation, provided by structural measures (e.g. levees, detention basins, dams) aimed at modifying the flow of floodwater.
2. *Property modification* aims to avoid or minimise loss by keeping development away from the floodwater using land use planning or building design, siting and materials.
3. *Response modification* aims to modify human behaviour through activities such as education, warning systems and preparedness planning.

It has become increasingly apparent that flood modification measures by themselves cannot protect communities in all flood events. As a result, in recent times, the emphasis of floodplain management has moved from the implementation of structural solutions such as levee banks to non-structural solutions such as flood warning, education and land-use management (Victorian Flood Warning Consultative Committee 2005). Furthermore, with the uncertainties surrounding accelerated climate change, the importance of these non-structural solutions is amplified.

“People need to respond to protect life and property in cases where water cannot be directed away from developed land or where flooding will exceed the design event” (Department of Transport and Regional Services 2002). Community education should be viewed as an important ‘response modification mechanism’ to prepare people for flooding and recovery in these situations. Moreover, some researchers and managers believe that improvement in community education is “the single most important action that could be taken to improve flood warning and associated response in Australia” (Elliott et.al., 2003).

FLOOD EDUCATION

Flood education is defined in this paper as ‘any learning process or activity that helps to mitigate the impacts of flooding by building community resilience’. It should be noted that ‘awareness-raising’ is included within the definition of flood education i.e. it is not viewed as a separate process to ‘education’. The role of ‘awareness-raising’ in flood education is discussed below.

It also should be noted that the term ‘education’ is used here not just related to learning in the ‘formal’ education sector (e.g. schools, pre-schools, universities, TAFE

colleges) but across all community sectors (e.g. residents, businesses, local councils, government agencies).

A NEW APPROACH TO FLOOD EDUCATION

The 'traditional approach' to flood education used by many emergency management organisations informed the community about floods and their risks through the dissemination of prepared material, emphasising actions people can undertake to protect themselves and their property. According to O'Neill (2004), this approach "was often one-off and one-way, and assumed that the audience was an undistinguishable group of individuals who had the same needs and values."

The traditional approach was based on the premise that raising individual awareness will lead to preparedness and response behaviours. According to Paton et al. (2003), "it is frequently assumed that providing the public with information on hazards and their mitigation will encourage preparation. This assumption is unfounded." Several researchers, such as Boura (1998), have demonstrated that there is not a strong causal link between receiving information and acting appropriately for hazards.

A more consultative and participatory approach to community flood and other hazard education is now being promoted by researchers. According to Paton (2006), "Participation in identifying shared problems and collaborating with others to develop and implement solutions to deal with them facilitates the development of efficacy, sense of community, and commitment to action. That is, it engenders the development of competencies that enhance community resilience to adversity".

In this participatory approach, the emergency management agencies assimilate and support the needs and directions of the community. They thus act as 'consultants' to communities (e.g. facilitators, resource providers, change agents, coordinators) rather than directing the change process in a 'top-down' manner as in the traditional approach.

A FOCUS FOR FLOOD EDUCATION PLANNING

Resilience not only refers to how well a community can anticipate, prepare for, respond to and recover quickly from floods but also its ability to learn from and improve its systems and response capacities for future flood events.

There are four main ways in which flood education can build community resilience to flooding.

1. Preparedness Conversion. Helping people, organisations (e.g. businesses) and communities commence and maintain their preparations for flooding.
2. Mitigation Behaviours. Learning appropriate actions (behaviours) - what to do before, during and after a flood.
3. Adaptive Capacity. Learning how to change and maintain systems and build capacities to minimise the impacts of flooding.
4. Post-flood Learnings. Learning how to improve mitigation behaviours and adaptive capacities after a flood event.

These four functions form the basis of a suggested general focus for community flood education planning based on the participatory approach. Each function is discussed in more detail below.

PREPAREDNESS CONVERSION

Especially if the levels of community preparedness are low, 'preparedness conversion' will be an important precursor to other pre-flood education relating to 'mitigation behaviours' and 'adaptive capacity'. The challenge for hazard education is to be effective in promoting preparedness behaviours, systems and competencies in an environment characterised by infrequent hazard activity, and to maintain this state of readiness over time (Paton et al., 2003). This challenge is exacerbated for flooding which many people view as being of comparatively low risk compared to other hazards in their complex hazardscape (Molino Stewart 2003, Molino Stewart 2005a, Molino Stewart 2005b).

Several researchers have designed psychological models to show how individuals commence preparations for flooding and the barriers that confront them to prepare. For example, Paton et al. (2003) propose three stages that people move through to prepare for flooding. These stages are:

STAGE 1. Motivation to prepare

STAGE 2. Forming intentions to prepare

STAGE 3. Converting intention to preparedness

There is also a need to design and implement education activities that maintain people's willingness to carry out preparedness activities, especially during times of drought.

Cognisant of this type of research, education practitioners have developed programs that attempt to engage individuals, organisations and communities in preparing for flooding. For example, the NSW State Emergency Service (SES) uses community events to encourage people to prepare for flooding. Important here is the one-on-one discussion with the SES that allows people to outline their flood situation, their motivation to prepare and any barriers to preparedness. The SES engages at a local level through volunteers who have an understanding of the local flood issues and who can be described as 'locals'. This adds weight to the engagement where people can discuss local issues with a peer and develop local strategies. The local volunteer utilises resources from the SES to assist in this.

MITIGATION BEHAVIOURS

An important part of community resilience is the use of appropriate behaviours before, during and after a flood that are aimed at safety and reducing damage. Compared to other community education fields that seek behavioural change (e.g. health education, road safety education, environmental education), flood education is arguably more challenging. These other education fields aim to change and maintain people's behaviours which are everyday and repeatable (e.g. recycling, obeying road

rules, healthy eating), whereas flood education helps people learn behaviours that are mainly only required in the event of a flood.

A major focus of flood education in NSW has been on improving preparedness behaviours, especially with residents and businesses. For example, the SES has produced a Business FloodSafe Toolkit that helps businesses plan their own actions for before, during and after a flood. The SES is also currently trialling a toolkit to help residents prepare for flooding. There are versions of both toolkits for riverine and flash flooding scenarios. These toolkits have been developed in consultation with community members, piloted in a range of locations and refined based on feedback from community members. The toolkits are designed to be flexible enough to allow for individual planning of mitigation behaviours.

ADAPTIVE CAPACITY

Resilience is a measure of how well communities adapt to a hazard such as flooding and then capitalise on new possibilities offered. It therefore not only includes the widespread use of appropriate mitigation behaviours by people but also the need for systems and capacities that allow for quick recovery and improvement after a hazard event. According to Paton and Johnston (2006), “Neither a capacity to adapt nor a capacity for post-disaster growth and development will happen by chance. Achieving these outcomes requires a conscious effort on the part of all people, communities and societal institutions to develop and maintain the resources and processes required to ensure that this can happen and that it can be maintained over time.”

Flood education can play an important role in building adaptive capacity through processes such as:

- Helping communities identify the values, competencies, resources and procedures that communities and institutions (e.g. emergency agencies) need to become more resilient.
- Encouraging community discussion about flooding and how to adapt to it.
- Training leaders and volunteers in helping others to plan for and adapt to flooding.
- Encouraging business continuity planning that includes adapting to flood.
- Conducting problem solving activities with community groups related to coping with different flood scenarios.

An example of flood education in NSW related to adaptive capacity is the 50 year commemoration of the 1955 Hunter flood which allowed people to learn more about the 1955 flood as well as about lessons learnt from the flood in floodplain and emergency management.

POST-FLOOD LEARNINGS

As discussed above, part of resilience is the ability for a community to learn from a flood event. Flood education has a role in facilitating the identification of these learnings and communicating them throughout the community. These learnings feed

back into the three education functions described above as individuals, organisations and communities prepare for the next flood.

Ways to facilitate post-flood learnings include conducting community de-briefs and social research (e.g. surveys, focus groups) to evaluate the effectiveness of mitigation behaviours and adaptive capacity (e.g. warning systems, infrastructure and other emergency systems) and identify improvements. The learnings can then be communicated to others through the media and community networks.

The NSW SES carries out extensive post-flood surveying to ascertain how to improve its own performance as emergency managers, the effectiveness of warning systems and its education programs, and the preparedness of affected communities. The learnings from this social research form the basis of identifying improvements for future floods.

LOCAL FLOOD EDUCATION PLANS

A relatively new way to formalise flood education processes such as those described above is through local flood education plans or strategies. These plans are developed, implemented and evaluated by local committees usually consisting of resident (urban and rural) and business representatives, local council and State government agency staff.

In some communities, local flood education committees need to be formed to manage the development of the local flood education plans. In other communities, the management of a flood education plan can be subsumed into the function of an existing floodplain management or emergency management committee. In every case, there needs to be local commitment and drive to ensure the success of the plans.

It cannot be assumed that the local committee has specific education expertise, especially related to the flood education functions identified above. Education practitioners such as the NSW SES can provide expert education guidance for these committees as required.

Local flood education plans should strongly promote and support individual, home and business flood preparedness plans. They also should build community capacity where appropriate (e.g. networks for learning, training of volunteers) and engage the community in the planning, implementation and evaluation phases. Social research should help guide the evaluation of the plan.

To date, flood education plans have or are being developed in four communities in NSW.

1. Maitland (to be discussed in detail in another paper at this Conference)
2. Newport Beach
3. Lismore
4. Rockdale.

Although the impacts of these plans have not yet been evaluated, the main benefits of these flood education plans at this stage appear to be:

- More community ownership in flood education
- Flood education activities planned for local needs
- Flood education activities to be rolled out systematically over time
- Improvements to be made to local flood education through planned evaluation
- State-wide and regional education initiatives to be utilised where appropriate to the local situation
- Flood education to be linked in with other local floodplain and emergency management planning where possible
- Higher levels of preparedness and appropriate actions during flood events (from post-flood analysis and anecdotal evidence).

CONCLUSION AND TAKE HOME MESSAGES

1. Flood education is becoming increasingly important to flood mitigation as we recognise the current limitations of structural works in flood events, especially in an uncertain future of accelerated climate change.
2. A shift in approach to flood education is required by floodplain and emergency managers from a 'top-down', information dissemination one to a community participation ('bottom-up') approach.
3. Flood education should concentrate on building community flood resilience through initially helping people to commence and then maintain preparations for flooding, especially if community preparedness levels are low. It then should help people learn appropriate behaviours for before, during and after a flood and help communities learn how to build their adaptive capacity to flooding. It should also help individuals and communities learn from flood events to improve their future preparedness.
4. A local community flood education plan appears to be a good way to formalise and effectively deliver this approach to flood education.
5. The NSW SES can play an important part in local flood education planning by providing expert education advice, engagement tools and a team of local SES volunteers to assist in the implementation of the plan.

REFERENCES

Birkmann, J., 2006, Measuring vulnerability to promote disaster-resilient societies: Conceptual frameworks and definitions, in J.Birkmann (ed), Measuring Vulnerability to Natural Hazards, United Nations University Press, Tokyo, Japan

Boura, J., 1998, Community Fireguard: Creating partnerships with the community to minimise the impact of bushfire, Australian Journal of Emergency Management 13, 59-64

Department of Transport and Regional Services, 2002, Benefits of Flood Mitigation in Australia, Bureau of Transport and Regional Economics, Canberra, Australia

Elliott, J., Handmer, J., Keys, C. and Tarrant, M., 2003, Improving Flood Warning – Which Way Forward?, Paper presented at the Australian Disaster Conference, Canberra, 2003.

Molino Stewart, 2003, Evaluation of the Woronora Valley Flood Preparedness Program Effectiveness, Final report for Emergency Management Australia

Molino Stewart, 2005a, Newport Community Flood Education Social Research, Unpublished report for Pittwater Council

Molino Stewart, 2005b, Upper Parramatta River FloodSafe: Building Local Support, Unpublished report for the Upper Parramatta River Catchment Trust

Monday, J., 2002, Building Back Better: Creating a Sustainable Community after a Disaster, in Natural Hazards Informer 3 available at <http://www.colorado.edu/hazards/informer/infrmr3/informer3.pdf>

O'Neill, P., 2004, Developing a Risk Communication Model to Encourage Community Safety from Natural Hazards, NSW State Emergency Service paper

Paton, D., Smith, L., Johnston, D., Johnston, M., & Ronan, K., 2003, Developing a model to predict the adoption of natural hazard risk reduction and preparatory adjustments, (Research Project No. 01-479): EQC Research Report

Paton, D., 2006, Community Resilience: Integrating Hazard Management and Community Engagement. Paper from School of Psychology, University of Tasmania

Paton, D., & Johnston, D., 2006, Disaster Resilience – An Integrated Approach, Charles C. Thomas Publisher, Springfield, Illinois, USA

Victorian Flood Warning Consultative Committee, 2005, Flood Warning Service Development Plan for Victoria: Review of Flood Warning System Development Priorities within Victoria, Commonwealth of Australia.