PLANNING FOR IMPROVED RESILIENCE

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Abstract

Disasters and development are inextricably linked, and while development planning has a long and well-established tradition, its ability to learn from disasters seems limited. Disaster planning by contrast is a relatively new field and its multidisciplinary approach has brought it to the boundaries of development planning.

Disaster planners have recognised the importance of greater integration with development planning in order to mitigate the effects of future disasters and to build greater resilience into urban communities. But, implementing any change to the development planning process must overcome entrenched views and the vested interests belonging to those that control the development process.

The first I-Rec conference on Post-Disaster Reconstruction provided a forum within which the elements for an integrated planning could begin to be identified. This paper provides an analysis of the I-Rec contribution and elaborates on a system for testing compliance with any new planning framework.

Keywords: Planning, resilience, development, disaster

INTRODUCTION

Research into the field of disaster planning and in particular, post-disaster reconstruction often raises the issue of development and development planning.

Development is a large and well-established subject area and in its broadest context relates to social, economic and physical aspects of society (King 1976, Taylor & Williams 1982, Pacione 1981). Development is thus defined as an evolutionary process, on going since the beginning of life itself. That is not to say that all development has been forward moving. But development in one way or another is unstoppable and inevitable.

King (1976) stressed that in order to understand the built environment it is essential to also understand these broader aspects of development. This has implications for

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the development planner and is seen as an essential prerequisite to ensure "appropriateness" of urban developments. Pacione (1981) contests that a narrow vision of development could account for the vast amount of inappropriate development that has occurred in the third world, much of which has been influenced by planning policies developed in Western nations but which do reflect the local traditions.

Disaster planning in contrast to development planning is new discipline. Disaster planning has its roots in sociological research (Stallings 2002). It has developed a multidisciplinary base however, with strong inputs from the earth sciences, health and engineering sectors (Alexander, 2000, Lewis, 1999, Macrea, 1995, Yasemin et al 1995).

The results of this broad based input has led to disaster planning policies with socio-economic, politico and technical elements (I-Rec 2002, Shelterproject 2003, UK Resilience 2002a). Within the UK disaster planning has recently had this diverse approach reaffirmed in the new Civil Contingencies Bill (HMG 2004, UK Resilience 2002b &2002c)

Perhaps inevitably therefore, disaster planners have realised the link between disaster and development (I-Rec 2002). Development planning on the other hand seems slow to recognise this link and opportunity exists to build greater resilience into urban communities by strengthening the links between development and disaster planning.

This paper will outline a system whereby these links may be strengthened and explore some of the practical considerations that come with the adoption of change within the development planning process.

THE PLANNING PROCESS

Development planning has been defined as:

> "An intervention in the development process by regulation and negotiation in order to protect the public interest as far as possible" (RTPI 1991)

It is this link with the "public interest" that highlights this need to be fully aware of the values and beliefs of the society within which the development takes place but also to the institutional and political context within which the planning system itself operates (King A.D. 1976). It is also this link that validates the argument by disaster planners that any new development should consider the disaster context and make provision for the mitigation of hazard impacts.

Planning in practice

A recent survey (RTPI 1991) identified that whilst the majority of people within the UK are aware of the development process and are also aware that this process is controlled through planning regulation, most respondents were unaware as to how the system operates.

The survey also revealed a link between the level of education of the individual and their understanding of the development process. This reinforced the impression within the professional planning community that middle class suburban residents with anti-development views dominated the development process.

In Third World countries, the control of the development process is even more restricted. Low levels of economic resources, public pressure for social change and political instability force many Third World nations to adopt a highly centralised administration for development planning (Pacione M 1981). In these cases a small political elite dominates the development process.

To some extent the RTPI survey and the work of Pacione seems to contradict the notion of a broad multidisciplinary and all-inclusive planning approach. But perhaps it is the very complexity of the process that restricts its operation to a small group of professional practitioners. This should make the task of integrating disaster and development planning easier by only needing to focus on a small but influential sector of society.

The difficulty in achieving integration is likely to come in the form of convincing a body of individuals with entrenched views and vested interests to implement a change to their established patterns of operation. The changes are likely to be seen as adding further complexity to the decision making process with little direct benefit to the decision makers.

Sustainable development

Recent history has shown that development planners can be made to incorporate new ideas. During the 1980s and 1990s the environmental lobby used public pressure to ensure that issues relating to sustainable development emerged as a strong point of focus for development planners.

Governments across the world adopted the aims and objectives of sustainability, including in the UK where much work was undertaken forcing planners to expand the range of factors they consider (Audit Commission, 2002).

Among the initiatives in the UK was the Local Government Act (2000) which placed a duty on local authorities to produce long-term community strategies to improve quality and sustainability in the local area. They are required to do this by involving

local partners including the public, private businesses, community groups and voluntary organisations. The Earth Summit (2002) in Johannesburg placed additional pressure on local authorities to adopt sustainable development practices and will, with little doubt, lead to further planning guidelines.

Disaster planners should take heed of this approach and recognise both the magnitude of the task and the timeframe required to incorporate change in the development planning process.

THE CONCEPT OF RESILIENCE

The amalgamation of historic developments in the disaster planning process has given rise to the concept of resilience. This concept has a focus on disaster and addresses the ability of the community to recover following the impact of a disastrous event.

In the UK the Government established the Civil Contingencies Secretariat (CCS) in 2001. The aim of the CCS was to improve the resilience of Central Government and the Country as a whole by working in partnership with Government and Non-Government Organisations. They defined the elements of resilience to include Anticipation, Preparation, Prevention and Resolution of challenges facing the UK (UK Resilience 2002c).

The CCS stressed the need for an integrated planning perspective in order to achieve resilience. Specifically any planning system should including all levels of Government as well as the Public, Private and Voluntary Sectors. They defined resilience as including a planning process based on partnerships, the sharing of best practice and systems that are developed and tested to cover the full range of potential, disruptive hazards (ibid).

Quarantelli (2002) when reflecting on 30years of personal involvement in Disaster research stressed that community resilience is founded on personal resilience. Tobin & Whiteford (2002) found that personal resilience feeds into family resilience which is a better representation of what constitutes the basis for community resilience. In their study of village communities displaced by volcanic activity in the Farras region of Ecuador, they established that personal resilience required economic, social, health and emotional support systems.

The Ecuadorian study stressed the need to adopt a multidisciplinary approach to the study of hazards. In particular the research focused on merging environmental hazards research with medical anthropology (ibid). The study also found that disasters often had a therapeutic effect on communities in the immediate aftermath of the event. This resulted in a raised sense of solidarity and altruistic behaviour, but this effect did not last long and when it broke down the vulnerable groups were those that were most affected. Any model of resilience must therefore recognise

these negative longer-term effects and include measures to mitigate against them (ibid).

Macrae (1995) points out that in Major, Complex and Political disasters the primary factors limiting access to resources are political. Human and institutional resources required to provide financial, social and security support are critically reduced. Thus post-disaster rehabilitation strategies need to be redefined.

Traditional rehabilitation strategies focus on reconstruction, but this assumes that what was in place before the disaster is what is needed after. These rehabilitation strategies are often inappropriately designed and lead to the obstruction rather than enabling of rehabilitation (ibid). Such strategies often sustain emergency-type responses at the cost of addressing the underlying structural problems.

The I-Rec conference (2002), provided a multidisciplinary environment where elements to a new and improved integrated planning process could begin to be developed (Fox 2003, Fox, Johnson & Lizerralde 2003) We can examine these issues within the framework of the disaster cycle, focussing on Preparedness, Mitigation, Response and Recovery which are the cornerstones of resilience.

Preparedness

Hazards and Risk

The UK is fortunate in that it is not considered a hazard prone area from the perspective of Natural Hazards. Hazards, which have the most likely impact often, have a social basis and of these the greatest risks are posed by the ones that damage the infrastructures of the Industrialised/Specialised society we rely on for our economic well being (Perry 1981).

Historically planners have focussed on the physical impact of hazards on the urban environment. Hazards were classified according to:

- Areal extent
- Speed of onset
- Duration

The focus was generally on single large events and a lot of work went into the development of methods to quantify the risk of these occurrences. Hazards were resolved down to a percentage figure of risk that remained fixed (ibid).

As research and understanding developed, planners became increasingly aware that the focus on large events with statistically low frequency obscured the fact that much damage is caused by smaller but more frequent events.

Vulnerability

During the 1980s and early 1990s the concept of vulnerability became a bigger issue and efforts were made to incorporate this into the planning process (Weichselgartner, 2001). But vulnerability is a difficult concept to measure, as it draws on wide-ranging and often dynamic socio-economic factors in society.

Studies in vulnerability also gave rise to the concept of hazard ecologies, which give greater emphasis to the smaller and more frequent disasters (Lewis, 1999). At the same time, the media was becoming increasing able to report up-to-the-minute news on a global scale. Large-scale disasters were widely reported and people's perceptions of the risks they faced altered. They became more aware of the consequences of disaster.

The level of vulnerability relates directly to the scale of impact that extreme natural hazards have on society. Vulnerability therefore, is often viewed as the root cause of disasters (ibid).

A focus on purely technical factors leads to the implementation of misguided redevelopment programmes following disasters. Altered levels of risk perception can even prevent valid rehabilitation programmes from proceeding if undertaken too soon after the event (i-Rec - Jigyasu, 2002).

Mitigation

Review of traditional and modern construction technologies

Research shows that adopting existing traditional technologies for post-disaster reconstruction helps to prevent the alienation of traditional values, contributes to the reinforcement of local self-confidence, reduces dependence on external aid, optimizes the use of already well adapted solutions to local conditions and helps with the reactivation of the local economy (i-Rec - Jigyasu, Salazar, Findlay, 2002).
However, best-practice improvements are likely to be required by the community in order to guarantee long-term sustainability of the reconstruction (i-Rec - Ofori, 2002).

Evaluation of coping mechanisms

Coping mechanisms are the plans, relationships and resources that families, organisations and governments have to help them cope with a disaster or the threat of a disaster. Evaluations of coping mechanisms results in an inventory of resources already in place, such as kin and kith networks, community organisations, insurance policies, and evacuation procedures (i-Rec - Findlay, 2002).

Following the evaluation of existing coping mechanisms is the development of comprehensive emergency management plans corresponding to the stages of mitigation, preparedness, and response within the disaster cycle (i-Rec - Sivaji, Karim, 2002).

Education and training
Researchers and proponents of development frameworks have all recognized the need for training and education (Yasemin, 1995, i-Rec – Ofori, 2002). This need is all the more important in disaster situations.

The scope of a training and education programme must include the identification of areas of vulnerability, measures (social, physical and organizational) that can be employed to reduce vulnerability and awareness of plans developed to manage post-disaster reconstruction activities (i-Rec – Fox, Jigyasu, 2002).

Strengthening of inter-organizational arrangements
Post-disaster housing reconstruction requires a variety of interventions that go beyond the construction of houses (i-Rec - Johnson, Lizarralde, 2002). However, due to the complexity of the tasks required for community recovery, reconstruction projects can rarely be developed by a single institution. An inter-organizational system is therefore required to develop complementary –and parallel- tasks (i-Rec - Ofori, 2002, Lawrence & Lorsch, 1970, Roberts, 1972).

Response

Needs assessment and damage evaluation
After a disaster, it is necessary to assess who and what has been affected and determine if people's basic needs are being met (i-Rec - Jayaraj, 2002).

Plans for disaster response, reconstruction and inter-institutional arrangements will need to be re-assessed to make sure they correspond to the particular disaster situation (i-Rec - Johnson, 2002). It is important to have an agile authority that is able to make quick adjustments to contingency plans (i-Rec - Findlay, 2002).

Development of community participation schemes
Participatory systems of development following disasters have been popular for a number of years and undergone significant evaluation (i-Rec – Salazar, Ofori, Jigyasu, Jayaraj, Karim, Yaoxian, 2002).

The lessons to be learned from this process are that participation must be tailored to suit the local conditions and traditions of the community. A distinction can be drawn between systems where the community are merely involved with the process and systems where the community participate with full decision-making powers (i-Rec Salazar, Jigyasu).

Environmental monitoring
Monitoring the impact of development on the environment lies at the heart of sustainability. All too often the response to a disaster overlooks this fact and, as a

result, reconstruction programmes often lead in increased environmental degradation, increased vulnerability and a reduction in sustainable livelihoods.

Limited research in the application of environmental impact assessment systems to post disaster situations has led to the development of assessment regimes that have no reference to environmental criteria (i-Rec – Amstivslaski, 2002)

Recovery

Performance evaluation

Potentially one of the most important methods to achieve improvements in reconstruction strategies is post-project evaluation (Davis and Everett, 1980). However, not only do aspects related to the product need to be examined in project evaluation; in fact, several aspects related with the process –not the product - prove to be crucial (i-Rec - Lizarralde, 2002).

The analysis of reconstruction as a system, including different levels in time (inputs, outputs, results, objectives) is an efficient method to evaluate development initiatives embracing the evaluation of the strategy, the results and the impacts obtained.

Knowledge development and dissemination

Ideally, affected communities can help organisations learn from past mistakes by documenting complaints for presentation to the authorities. Volunteers available in government offices can help people with complaints, and organize public hearings for addressing issues that need public attention (i-Rec - Jayaraj, 2002). More practically, meetings and conferences that link organisations, researchers and practitioners are extremely helpful for knowledge development and dissemination of evaluation results. Publications in print or on the Internet allow the information to reach a wide audience. Finally, it is important to guarantee that “knowledge gained is knowledge applied” (i-Rec - Findlay, 2002).

PLANNING FOR RESILIENCE

It is possible to translate the above finding more specifically in terms of the planning process:

- For a community to improve its resilience to a disaster impact, it must first undergo a process of hazard identification
- All risks associated with hazards need to be quantified in order to assess priorities for further investigation and dedication of resources

- Examining socio-economic factors allows vulnerability to be mapped in relation to the risks and hazards faced by the community

- Environmental considerations ensure that sustainability factors are equated.

All of the above can be done prior to the disaster impact.

Actions to improve resilience following the disaster impact include:

- Develop procedures to assist the community in meeting all its immediate survivability needs:
- Implement long term plans which will allow recovery to happen as quickly and as efficiently as possible:
- Incorporate any lessons learned as a result of the disaster

These are all considerations planners must take into account in order to build resilience into the urban environment. Practitioners should also be aware that this is a task requiring a wide range of skills, experience and technology.

COMPLIANCE TESTING

Assessment is useful in the developmental stage of creating such a planning process. It allows for the identification of gaps in the framework content and for the determination of existing levels of compliance. Once the framework is established and operational, assessment can be used to establish local and national norms, strengths and deficiencies.

Lessons can be learned here from the experiences of FEMA (1997) and their development of the Compatibility Assessment for Readiness (CAR) methodology for testing disaster preparedness planning in the USA.

The CAR methodology makes use of indicators, but they are referred to as attributes. The method relies on a self-assessment undertaken by participants after appropriate training and guidance provided by the monitoring authority. FEMA experience shows that training of participants is essential to ensure continuity in interpretation of ability and thereby provide greater validity to the results.

Indicators

Any framework for improving resilience should seek to incorporate the issues and elements described in the foregoing sections. In addition, the framework should incorporate other similar methodologies from which it may draw on for support. An examination of these related methodologies reveals how “indicators” have been used for development, guidance and measurement purposes.

Audit Commission (2002) – Quality Indicators (local level)

Within the UK, the Audit commission created a set of quality/sustainability indicators with13 theme areas in 4 broad categories.

European Sustainable Cities and Towns Campaign, (90 Local Authorities)

The European Union has also developed a second set of indicators with a slightly wider, perhaps regional focus. They identified 10 indicators with 6 areas of concern.

UN Commission for Sustainable Development (National)

The UN has developed a set of 14 national level indicators within 4 broad categories.

For a development planning framework dealing with resilience to mesh with these related local, regional and national frameworks a specific set of indicators needs to be developed to consider:

- Physical infrastructure
- Social infrastructure
- Economic infrastructure
- Environmental management
- Community involvement

CONCLUSION

The development of a framework for improving resilience of urban communities is a topic receiving much attention within the UK, as illustrated by the Emergency Planning Review in August 2001, the activities of the Civil Contingencies Secretariat (CCS) and the development of the new Civil Contingencies Bill.

On an international level, the need for such a framework has been established within the field of post-disaster reconstruction as illustrated by I-Rec (2002). The I-Rec conference achieved an evolution beyond the limit of current frameworks incorporating feedback resulting from new research, working practice and recent technological developments.

The framework outlined in this paper offers significant potential for further input and development. Issues raised highlight the complexity of development planning and the increasing importance that disaster management plays in achieving long-term sustainability.

In the words of Lewis (1999) practitioners will be aware that this framework requires a multi-sectoral responsibility and individuals that can fully comprehend the issues, develop plans and implement measures to tackle the complexity that is inherent in sustainable programmes that deal with disasters.

REFERENCES

Audit Commission.(2002) *Quality of life indicators - Public Sector feedback paper*. London: Audit Commission

David Alexander (2000). *Confronting Catastrophe*. London: Terra;

European Sustainable Cities & Towns campaign. (ESCTC) (2000) *Towards a local sustainability profile - European Common Indicators*. www.sustainable-cities.org

FEMA, (1997) *Capability Assessment for Readiness*, www.fema.gov

Fox A (2003) A framework to improve resilience planning for urban communities, *Secuirty Monitor*, 1 (5) Jan pp8-10

Fox A, Johnson C & Lizarralde G (2003) A framework for improving the sustainability of housing initiatives to reduce the risk of disasters, *Proceedings of the International Civil Engineering conference on Sustainable Development in the 21st Century,* Niarobi, Kenya, pp 399-404

HMG (2000) *Local Government Act*, HMSO, London

HMG.(2004) *Civil Contingencies Bill 2004*. London: HMSO;

i-Rec (2002), Conference on improving post disaster reconstruction, Montreal, Canada, 2002, **14 online papers**: http://www.grif.umontreal.ca/pages/irechomepage.html

King (1976)

Lewis J. (1999), *Development in Disaster Prone Places*, ITDG, London

Macrae J. (1995) *Dilemmas of post-conflict transition - Lessons from the Health Sector.* ,London

Menoni S, Pergalani F (1996). An attempt to link risk assessment with land use planning: A recent experience in Italy. *Disaster Prevention and Management*. 1996; 5(1):6-21.

Pacione M (1981) *Problems and planning in 3rd World Cities,* Croom Helm, London

Perry A.H.(1981) *Environmental Hazards in the British Isles*. London: George Allen & Unwin;

Quarantelli E. (2002) The Disaster Research Centre (DRC) field studies organized behaviour in the crisis time periods of disasters, *Methods of Disaster Research*, Xlibris, USA, pp 94-126

RTPI (1991) *Planning – Is it a service and how can it be effective*, RTPI, London

Shelterproject.org.(2003) *Report on the transitional settlement sector*. Cambridge:

Stallings R.A. ed (2002) *Methods of Disaster Research*, Xlibris, USA

Taylor J.L. & Williams D eds (1982) *Urban Planning Practice in Developing Countires,* Pergamon, Oxford

Tobin & Whiteford (2002) Community Resilience and Volcano Hazard: The eruption of Tungurahua and evacuation of the Faldas in Ecuador, *Disaster*, 26 (1), pp 28-48

UK Resilience. (2002b).. *Civil Contingencies Bill - Update*., www.ukresileince.info

UK Resilience; (2002a). *Emergency Planning & The Law*., www.ukresileince.info

UK Resilience; (2002c).. *The Civil Contingencies Secretariate*, www.ukresileince.info

UN-ESA, (2001) *Indicators of Sustainable Development*, , www.un.org/esa

Weichselgartner J.(2001) Disaster Mitigation: The concept of vulnerability revisited. *Disaster Prevention and Management*.; 10(2):85-95.
Yasemin A. et al. (1995), "*Developing building for safety programmes*", ITDG, London