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Environmental Planning

S. Alagappan

Dept. of Agronomy, The Indian Agriculture College (Affiliated to the Tamil Nadu Agricultural University), Raja Nagar, Radhapuram, Tamil Nadu (627 111), India



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Corresponding Author

S. Alagappan

e-mail: alga.s@rediffmail.com

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E-mail: bioticapublications@gmail.com

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Abstract

Guiding Principles for Environmental Planning are two principal environmental concerns: restoring damage to the environment from a disaster and minimizing the environmental impact of the reconstruction process itself. Site planning in new settlements should be governed by ecological concerns. Construction methods, building designs, and choice of materials all have an environmental impact; they should be based on local practices while being eco-friendly. Disaster debris is a valuable resource that should be reused during reconstruction whenever possible. However, materials that can be harmful to workers or the environment, such as asbestos or toxic substances, must be managed carefully.

Introduction

Disasters almost always have negative environmental impacts, ranging from damage to ecosystems to the production of vast quantities of waste. Post-disaster reconstruction can either be an opportunity to address these impacts and long-standing environmental problems in the disaster location or it can cause a second wave of damage. The choice is up to decision makers responsible for assessment, planning, and implementation of reconstruction programs. Assessment allows the disaster's environmental impacts to be identified and priority areas for corrective action to be determined. Physical and environmental planning are the present opportunities to analyze and rebalance the relationship between the built environment and the natural environment. And in implementation, actions can be taken that aid environmental recovery, mitigate the impacts of the reconstruction itself, and promote long-term sustainable development goals. The scope of "environmental issues" is broad and encompasses built, social, and economic and ecological aspects, and each of these affects those who live where the disaster took place. This chapter focuses principally on critical ecological and built environment issues related to housing demolition and reconstruction. It attempts to persuade those involved in reconstruction that restoration of the environment should be one of their highest priorities. To that end, it covers environmental impact assessments, relocation, waste management, ecological planning of new settlements, environmental needs of habitat, and environmental assessment of housing reconstruction.

Environmental Planning is the process of facilitating decision making to carry out land development with the consideration given to the natural environment, social, political, economic and governance factors and provides a holistic framework to achieve sustainable outcomes. A major goal of environmental planning is to create sustainable communities, which aim to conserve and protect undeveloped land.

Some of the main elements of present-day environmental planning are:

- Social & economic development
- Urban development
- Regional development
- Natural resource management & integrated land use
- Infrastructure systems
- Governance frameworks

Key Decisions

National and local governments must decide on the legal framework for environmental management to be applied during reconstruction and on a division of labour that will ensure its successful implementation.

The Government should decide immediately which agency will be in charge of post-disaster debris management and that agency should plan and coordinate the debris management program in a way that reduces risk, facilitates recovery and reconstruction, and disposes of debris in a cost-effective and environmentally sound manner, while keeping disposal of reusable or saleable materials to a minimum.

The lead environmental agency must decide how to provide environmental guidance to all institutions active in reconstruction, keep this information updated, and monitor reconstruction implementation. It must also decide what incentives and sanctions will be employed.

Land use planning and environmental institutions need to agree on the mechanisms to ensure that post-disaster environmental planning and management activities are integrated with land use and site planning, as well as on how these local activities will be coordinated with the lead disaster agency.

In a consultative manner, government should define how local community and civil society organizations can contribute to environmental protection during reconstruction and on coordination mechanisms among the organizations and with government. These organizations can participate in local debris management, assessments, reconstruction monitoring, technical assistance and project implementation

Type of Disaster

Hurricane/ Cyclone/ Typhoon- Associated Environmental Impact

Loss of vegetation cover and wildlife habitat, Inland flooding, Mudslides and soil erosion, Saltwater intrusion to underground freshwater reservoirs, Soil contamination from saline water, Damage to offshore coral reefs and natural coastal defence mechanisms, Waste (some of which may be hazardous) and debris accumulation, Secondary impacts by temporarily displaced people, Impacts associated

with demolition, reconstruction, and repair to damaged infrastructure (e.g., deforestation, quarrying, waste pollution).

Tsunami

Groundwater pollution through sewage overflow, Groundwater pollution through sewage overflow, Groundwater pollution through sewage overflow, Saline incursion and sewage contamination of groundwater reservoirs, Loss of productive fisheries and coastal forest or plantations, Destruction of coral reefs and natural coastal defence mechanisms, Coastal erosion or deposition of sediment on beaches or small islands, Marine pollution from back flow of wave surge, Soil contamination, Loss of crops and seed banks, Waste accumulation - additional waste disposal sites required, Secondary impacts by temporarily displaced people, Impacts associated with demolition, reconstruction, and repair to damaged infrastructure (e.g., deforestation, quarrying, waste pollution).

Earthquake

Loss of productive systems (e.g., agriculture), Damage to natural landscapes and vegetation, Possible mass flooding if dam infrastructure is weakened or destroyed, Waste accumulation - additional waste disposal sites required, Secondary impacts by temporarily displaced people, Impacts associated with demolition, reconstruction, and repair to damaged infrastructure (e.g., deforestation, quarrying, waste pollution), Damaged infrastructure as a possible secondary environmental threat (e.g., leakage from fuel storage facilities), Release of hazardous materials from industries, medical facilities, and nuclear plants.

Flood

Groundwater pollution through sewage overflow, Loss of crops, trees, livestock, and livelihood security, Excessive siltation that may affect certain fish stocks, River bank damage from erosion, Water and soil contamination from fertilizers and/or industrial chemicals, Secondary impacts by temporarily displaced people, Sedimentation in flood plains or close to river banks.

Volcanic Eruptions

Loss of productive landscape and crops buried by ash and pumice, Forest fires as a result of molten lava, Secondary impacts by temporarily displaced people, Loss of wildlife following gas release, Secondary flooding should rivers or valleys be blocked by lava flow, Damaged infrastructure as a possible secondary environmental threat (e.g., leakage from fuel storage facilities), Impacts associated with demolition, reconstruction, and repair to damaged infrastructure (e.g., deforestation, quarrying, waste pollution).

Landslide

Damaged infrastructure as a possible secondary environmental threat (e.g., leakage from fuel storage facilities), Secondary impacts by temporarily displaced

people, Impacts associated with demolition, reconstruction, and repair to damaged infrastructure (e.g., deforestation, quarrying, waste pollution).

Rapid Environmental Impact Assessment

Governments, international aid agencies, NGOs, and communities use rapid environmental impact assessments (REAs) as the key starting point after any disaster. An REA needs to be conducted within 120 days of the event.

1. There are standards manuals and guidelines for REA on organization-level assessments, community-level assessments, consolidations, and analyses. Personnel required for an REA include specialists on disaster relief and environmental impact assessments (EIAs). Community REAs can be conducted by NGOs and field practitioners.
2. During the early recovery phase, UNEP recommends the use of the Environmental Needs Assessment (ENA) methodology.
3. More detailed environmental studies may also be needed to analyze the particular issues of environmental impact at the relevant scale.

At the end of the housing reconstruction process, an integrated environmental assessment should be part of the project evaluation. In Aceh, Indonesia, after the 2004 tsunami, the following 10 priority areas for environmental management in the recovery process were identified: (1) contaminated groundwater; (2) sanitation; (3) lost livelihood; (4) lack of coordination in relief or recovery response during the emergency response phase; (5) shelter and related domestic needs; (6) enhanced roles identified for local governance and the role of communities in environmental management; (7) volume of (mixed) waste; (8) uncertain land tenure for tsunami survivors; (9) strengthening of local government to overcome the loss of infrastructure, staff, and resources; and (10) increase of capacity to direct and absorb relief assistance for sustainable development. Impact of Ocean Warming on Tropical Cyclone Size and Its Destructiveness was reported by Sun *et al.*, (2017).

Tools for Environmental Planning

Community participation is absolutely critical at each stage of environmental planning and assessment. Public hearings, held to inform the community of environmental assessments and planned actions, can bring together all stakeholders, including project proponents, environmental agencies, NGOs, citizens, and project-affected persons. The tools outlined below aim to apply core principles of building local capacity of communities to prevent and mitigate disasters, create partnerships among stakeholders, share and exchange information, and develop learning and

decision-making tools to address disaster impacts. All tools incorporate common elements, such as assessment, stakeholder involvement mechanisms, and monitoring.

Assessment Tools

Rapid Environmental Impact Assessment helps identify and prioritize likely environmental impacts in natural disaster conditions. A qualitative assessment approach is used to rank issues and identify follow-up actions.

Environmental (or Ecological) Risk Assessment evaluates the adverse effects that human activities and pollutants have on the plants and animals in an ecosystem, and identifies impacts on human, ecological, and ecosystem health.

Environmental Impact Assessment involves analysis of baseline environment, identification and evaluation of impacts, and mitigation measures to remedy adverse effects of natural and man-made disasters. How to Do It: Carrying Out Environmental Impact Assessment and Environmental Monitoring of Reconstruction Projects, for guidance on carrying out an EIA.

Planning Tools

Eco and Hazard Mapping (EHM) serves as a simple systematic and visual tool that aids in post-disaster reconstruction planning by using maps and plans of cities, neighbourhoods, and buildings. The mapping process involves multi-stakeholder participation. Participants mark all environmental aspects, hazards, and risks on plans and maps that contribute to the formulation of post-disaster recovery plans.

Environmental Profiling provides planning and management options based on a study of development setting, environmental setting, and disaster setting of a city or village. The development setting studies the socioeconomic structure, institutional structure, and environmental resources. Environmental setting studies the natural and built environment in detail. Disaster setting provides an analysis of hazards and vulnerability faced by communities. India and Global Climate Change: Perspectives on Economics and Policy from a Developing Country. Resources for the Future was reported by Toman *et al.*, (2003).

Implementation Tools

Environmental Management System used as a problem-solving and problem-identification tool based on the concept of continual improvement. EMS forms the core of the international environmental standard ISO 14001. The EMS adopts the Plan-Do-Check-Act cycle to develop environmental policies; frame the EMS; and implement, review, and revise performance.

Environmental Management Plan an Environmental Plan

(EMP) is used to monitor the impacts and mitigation measures agreed to in the EIA of a specific project. How to Do It: Carrying Out Environmental Impact Assessment and Environmental Monitoring of Reconstruction Projects, for guidance on carrying out an EIA and implementing an EMP. "Increasing trend of extreme rain events over India in a warming environment" was reported by Goswami *et al.*, (2006).

Conclusion

Environmental issues are not restricted to the disciplinary boundary of environmental management. In a post-disaster context, environmental issues also deserve consideration when making decisions regarding, among other things, financial management, technical and engineering aspects of housing reconstruction (safer design), material availability, accessibility, cost, and time. Environmental issues tend to become a lower priority when measured against the desire to speed up the reconstruction. Respecting the existing environmental policy framework of

the country and documenting and mapping environmental hazards and assets may help rebalance these considerations. In the long run, wise environmental decisions will pay off.

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