Low Cost Community Level Mitigation Measures

Proposal for a Pilot Project to ECHO, EU by the Oxford Centre for Disaster Studies (OCDS) and the Intermediate Technology Development Group (ITDG)

rector - Ian Davis, Managing Director of OCDS

Background to the Pilot Project

During the IDNDR many developing countries (and countries in transition) are focusing their attention on ways to reduce their risks. A vast array of techniques are being publicised and in certain cases implementation is in progress to reduce hazard impact to vulnerable communities. Many of these measures are costly in terms of cash, expertise, technology, labour or disruption in terms of social acceptability and dislocation. However, a body of knowledge exists within most hazard prone countries (particularly those countries where hazards have a frequent return period) of indigenous survival or coping mechanisms that protect people and their property (Examples are provided in Appendix 1).

There is a need to identify those local level indigenous appraoches that require minimal levels of professional expertise and financial outlay and that may have a wider application both nationally and internationally. To fulfil this need a pilot project is proposed to identify these risk reduction measures, test their effectiveness, reach an understanding of those processes which explain their acceptability and devise methodologies for wider applicability.

In recognising the wide scale of such an undertaking it is proposed that a Pilot Project be initiated that focuses on two specific locales, in the Philippines and India, and on those approaches that have proven effective for mitigating risks and adapting to hazards. This will provide the opportunity to explore the use of low cost mitigation measures in specific case studies, and assess whether the general objectives of a wider project are viable. The pilot project will indicate whether the following aims of the extended project are feasible.

Aims

The aim is to reduce risks to local communities and their property at the level of local vulnerable communities. This will require the following:

- Identification of effective mitigation approaches and the methods by which local knowledge and skills evolve and are transferred.
- Testing whether such apprroaches are effective.
- Examining and devising methodologies to explain why techniques and processes have been adopted.

- Creating a framework that supports the wider dissemination of requisite methodologies for the transfer of both technical and behavioural mechanisms for vulnerability reduction.

- Encouraging officials from both government departments and NGOs to identify and understand local measures in use in their own countries and to see how their response and techniques can be improved and incorporated into disaster planning at all levels.

- Promoting awareness of diverse approaches and the reasons for their adoption to all agents in disaster mitigation (at local, national and international levels).

Thus the extended project aims to gather a range of simple low-cost measures that have been proven as effective ways of identifying and reducing risks as used by people adapting to the hazards with which they live on a daily basis. The extended project will also consider, within the area of low cost mitigation measures, those community coping mechanisms which limit the impact that disasters have on communities.

The project will test and design methodologies that recognise community coping mechanisms, illustrate the need to take into account the real needs and demands of those affected by disaster and examine the potential for transferring these mechanisms to other communities in a manner which retains applicability to societal processes and situation variables. It is these processes which ultimately determine whether technology and planning is effective: "The test should be the existence of living, tangible, straightforward measures at the local level, that people use in practice."

The pilot project will be managed by the OCDS, with the ITDG assisting in the dissemination process and providing advisory assistance. If the pilot project is successful and provides recognisable benefits in vulnerability reduction, both organisations will prepare an outline proposal for the extended project. In combination both organisations have the technical ability, expertise and experience to successfully manage such projects.

OCDS

OCDS is well placed to undertake the co-ordination of this project since their staff, who have wide experience of providing Disaster Management consultancy and training support for International Agencies, governments and NGOs, has also led eight in-country disaster management training workshops for local NGOs who operate at community levels. Through these training programmes a persistent need has been communicated for practical advice of this nature. Further, the staff of OCDS have been undertaking a project for the British ODA on building improvement programmes in hazard prone areas. This project has focused on the training of local builders in low-cost safe building techniques. Through their long experience and international recognition in the subject, the staff of OCDS have built up a large network of professional and community contacts within hazard prone regions; those elicited for their opinions have shown considerable enthusiasm for this project. It is envisaged that some of these would become project partners.

A capability statement for the OCDS, along with individual *Curricula Vitae* is included in Appendix 1.

ITDG

The Intermediate Technology Development Group (ITDG) has extensive expertise in community-based shelter and disaster mitigation through field projects in Africa, South Asia and South America involving technical work, training and dissemination. It has been instrumental in setting up two regional networks: the Network for Social Studies in Disaster Prevention in Latin America (LA RED) and a new disaster mitigation and vulnerability network in South Asia, both of which receive support from the ODA.

Through its six country offices in the South and international technical enquiry services, consultancies and publications, ITDG has access to a large and wide ranging body of development practitioners and policy makers. The organisation has a strong interest in indigenous technical knowledge and the methods by which it is accepted and transferred within and between communities. ITDG strongly believes that knowledge and experience acquired in the field has to be translated into information that provides a basis for dialogue and the adaptation of policies at international, governmental and non-governmental levels.

The ITDG is therefore well equipped to contribute to both the pilot project and, should the results prove favourable, a wider programme in all spheres. This will include information gathering, technical guidance, the examination of socio-economic factors and the design and dissemination of findings and recommendations.

Underlying Assumptions

Both the pilot project and the perceived need for extending the project are based on a number of assumptions:

- That local communities in hazard prone areas are normally aware of the threats they face, and in the long term often adapt their behaviour or adopt ingenious methods of reducing the risks.

- That the transfer of knowledge among and between communities will need to be undertaken by representative community organisations or leaders, or through other appropriate channels of grass-roots communication.

- That community-based approaches to disaster mitigation are a prerequisite for success - imposition from above will not work.

- That NGOs and other agencies can play a useful role in helping to transmit information on effective community mitigation practices to other communities facing similar problems.

- That poor families may be fully aware of risk reduction techniques but choose not to adopt them since they may have an adverse effect on their livelihood (i.e. relocating from an unsafe site to a safer area).

- That poor families may have very small reserves of cash to afford any changes. Therefore most effective grass-roots solutions need to be labour rather than capital intensive with the widespread use of local materials and skills.

- That any technology needs to be both "appropriate" from the perspective of the local user, and must be both useable and understandable.

- That whilst technological know-how exists to strengthen and protect communities it is often in a form that is impractical and not understood by the recipients. The focus should be on finding means to adapt this technology to meet real requirements and realities.

- That the gender impacts of disaster mitigation processes need particular attention.

- That the job of the facilitating bodies (OCDS and ITDG) is to:
    - act as a catalyst;
    - co-ordinate the research and dissemination of information;
    - work with in-country organisations or networks that in turn have good access to local community groups;
    - organise testing and evaluation of mitigation measures where appropriate;
    - organise and optimise dissemination.

Involvement of ECHO

The project is proposed to ECHO since it relates to their stated project selection criteria as stated in the VOICE newsletter Vol. 1, No 6, pages 3-4.

1. "The development of human resources."
This project is primarily concerned with the development of a community's capacity to protect itself by using its traditional approaches which may need to be improved and, where the knowledge is unapplied, for techniques to be introduced.

2. "To strengthen the structures at various levels."
The aim is to apply international funding and expertise to assist national governments and national NGOs that operate at the community level to improve local protection measures. Thus the project has been designed with an emphasis on securing the support of groups with knowledge of the local situation as well as the confidence of community leaders.

3. "To support local low cost technology projects"
This is the essence of the entire project. The most important underlying assumption is that communities can provide a high level of their own protection by using traditional methods rather than having to resort to expensive approaches which may be culturally unacceptable and financially unsustainable.

The Proposed Pilot Project

Before undertaking such a wide ranging project as described above, it is proposed that a Pilot Project be undertaken. This will provide the opportunity to explore the use of low cost mitigation approaches and community coping mechanisms in specific case studies, test the research methodology and assess whether the general objectives of the main project are viable.

The Pilot Project will look specifically at indigenous low cost mitigation measures to protect houses from cyclones. This will build on the existing experience of both facilitating organisations. OCDS staff are currently finalising a two year project that has been concerned with producing guidelines on developing low-cost safe building programmes in hazard prone areas. In addition, ITDG has been researching cyclone and flood resistant housing in the Caribbean, Pacific and South Asia, looking at the technical, institutional and communications aspects. It should be noted that the focus on cyclones is for the Pilot Project only and that the larger project will have a much wider hazard focus.

There are two primary purposes in this project. Firstly, to investigate the effectiveness of local mitigation techniques. Secondly, given that a major purpose of the main project is a wider understanding of why techniques are used (or not), the Pilot Project will look specifically at how suitable technologies and coping mechanisms can be identified, presented and incorporated into community planning in differing contexts.

Case studies will be carried out in the Philippines and India. In the Philippines, the coastal area of Legazpi Sorsogon is proposed as the case study area, due to its exposure to typhoons. In India, the coastal region of Andhra Pradesh is proposed as the case study area for similar reasons.

There are four main tasks of the Pilot Project:

1. **To identify what mitigation measures have been adopted in the case study examples.**

2. **To identify the reasons for the successful adoption of these measures.**
   This will require investigating social, cultural and economic factors, as well as the technical issues. Although there is increasing awareness of the importance of such matters, little if any, serious research has been done to examine how they operate in practice. Yet an understanding of such processes is essential if low cost mitigation techniques, however technically appropriate, are to be promoted.

3. **To rigorously test the technical merits of these measures to withstand cyclones.** Although the technical quality of the mitigation measures is only one of many factors affecting their acceptability, it is, of course, essential that any measures do have the necessary strength to withstand the anticipated hazards.

4. **To investigate the indigenous channels through which technical information is communicated.**
   This is essential if mitigation techniques are to be disseminated at a local level.

The Pilot Project provides an opportunity to explore in detail the issue of communicating low cost mitigation techniques. It serves as an essential prerequisite to any prospective major project on low-cost mitigation. Unless the wider processes in existence at a local level are understood, then attempts at disseminating mitigation measures, no matter how technically sound, are likely to be unsuccessful. Although the primary purpose of the Pilot Project is to explore the feasibility and value of a larger and more wide ranging major project, it will, nevertheless, constitute a valuable research project in its own right: Any findings, recommendations and assessment methodologies used, will be disseminated through the channels built into the pilot project itself: Both organisations will use their established networks to ensure that any lessons learnt contribute to knowledge and practice in community risk assessment and the reduction of community vulnerability.

The pilot project may benefit from being under the supervision of an advisory steering committee which, if required, would be chosen after consultation with ECHO. The function of such a steering group would be to monitor and receive all reports during the pilot project. The group would recommend and report any change in emphasis that may be necessary. After each of the scheduled steering committee meetings a report would be sent to ECHO.

The Case Studies - Local Partners

It is proposed that for each case study the OCDS Project Co-ordinator will work closely with a local counterpart for the entire period of fieldwork. This will be a great advantage in gaining a rapid understanding of local issues relevant to the adoption of mitigation measures, and of local communication channels.

In addition to the local counterpart, it is important that the Project Co-ordinator liaises closely with local government officials and NGO staff. This will be a form of "risk spreading" on the assumption that it will provide two routes to the same destination.

Finally, an-country structural engineers possibly working with social scientists will be used to undertake field testing of the physical mitigation measures identified. There is sufficient expertise in both countries to undertake this work, and it will not be necessary to draw on outside experts.

A. Philippines.

Local Counterpart: Rosario Incarnation Tan, Architect. Ms Tan is one of the leading authorities in the Philippines on vernacular architecture. She is co author of Folk Architecture (GCF Books: Philippines 1989, with Rodrigo Perez and Julian Dacanay).

Government: In the Philippines the Governmental link will be with the local staff of the Department of Social Welfare and Development (DSWD). This is the body that provided the impetus and resources for the Core Shelter Project (a low cost initiative to build dwellings that will resist cyclone and earthquake impact). This Ministry has excellent local representation in the cyclone affected area of

Legazpi Sorsogon. OCDS are currently working with DSWD in a programme concerned with community level training and have co-operated closely with this ministry since 1986.

NGOs: OCDS has good contacts with Philippine NGOs. Staff of OCDS have had close working relationships with both the Philippine National Red Cross (PNRCS) and the Philippine Relief and Development Services Inc. (PHILRADS). These links have been developed during the past five years and led to a training course for PHILRADS in Manila in 1991. The Red Cross has local chapters in the Barangays (the smallest unit of government) and PHILRADS is linked to church groups in the designated region.

Testing Stations: The Office of Science and Technology (OST) will be the appropriate body to advise on suitable testing stations. (Ian Davis discussed this proposed project with DSWD during his visit to the Philippines in February 1994 and they offered to Liaise with OST over the issue of testing).

B. India - Coastal Area of Andhra Pradesh

Local Counterpart: Development Alternatives. This is a Delhi based NGO which has extensive experience in shelter and has specialist staff in architecture, civil and mechanical engineering, planning, sociology, geography and economics. They have good contacts with ITDG and have also worked with an OCDS staff member in relation to reconstruction following the Kilari earthquake.

Government: In India it is proposed to work at a government level with the National Institute for Rural Development, Hyderabad, India. OCDS have been working closely with the director of NIRD for 3 years in a number of disaster preparedness projects, which included three workshops in disaster management run by OCDS staff in Oxford.

NGOs: In addition to Development Alternatives, there are a large number of Indian NGO groups who are able to assist in disseminating project results. These include UNNAYAN, an NGO with extensive experience of post disaster housing, and Oxfam India.

Testing Stations: Technical support in India will be provided by the Dr. B. Venkateswarlu from the Wind Engineering Laboratory, Structural Engineering Research Centre, Madras. He is national co-ordinator of the Government of India Project "Engineering of Structures for Mitigating Damage due to Cyclones" which is funded by UNDP.

Dissemination of Pilot Project Results

Immediate steps that could be taken to disseminate the project findings could include:

- Production and distribution of the report to ECHO and to selected target agencies in North and South and through ITDG country offices and the two regional disaster mitigation networks, especially the South Asia network. The ITDG offices in both Sri Lanka and Bangladesh have already expressed their interest in the results of this work.

- Preparation and distribution of summaries, articles, etc., based on the report.

- Evaluation and feedback of dissemination techniques and cultural acceptability.

Longer-term dissemination will be through the fuller project that will be designed on the basis and findings of the Pilot Project. As stated below, this could include: school education programmes; training workshops; inputs into networks; information sharing workshops for government staff, international agencies and NGOs; technical consultancies to other field programmes, etc.

Design of Major Project

In addition to this dissemination and the hopeful transfer of positive measures and findings generated by the case studies in cyclone housing from India and the Philippines, the lessons provided by the pilot project will be used in the preparation of an outline design for a major project on low cost mitigation measures. To maintain and build upon the momentum generated by the Pilot Project, it is proposed that the OCDS and ITDG should schedule and incorporate this outline design at the end of the final Pilot Project report.

Outputs

If the research and testing of the pilot project and the wider continuum show that techniques can be devised to assist in the acceptance and implementation of technology and coping mechanisms by communities, then an outcome could be the provision of a package of materials that can be used by communities themselves for disaster planning, risk assessment and the prioritisation of responses. In addition such materials could be used by the local NGO or Governmental counterparts to identify and carry out small scale projects to provide support, in collaboration with the local community, which is based on the reality of the situation, the resources available and the threat faced.

Possible outputs could include:

- research methods to collect information on both techniques used and how to collect data at the community level.
- training workshops on data collection for community disaster planning
- methodologies for technology transfer
- inputs into networks, or the development of new networks
- information sharing workshops for government staff, international agencies and NGOs
- technical consultancies to other field programmes
- contributions to ITDG's own fieldwork and policy influencing role
- publications
- contributions to relevant journals
- conference presentations
- technical information logged on technical enquiry databases
- provide ECHO with detailed guidance on the role and requirements for successful field level interventions concerned with the development of local knowledge of safety measures.

If research and testing show that certain techniques either do not provide the necessary protection, or are unacceptable to the community, then an outcome will be practical advice, presented to communities, on other ways of reducing risk.

Pilot Project Staff Requirements and Roles

OCDS

Project Director: Dr Ian Davis
Using the experience gained from twenty four years work in Disaster Management and his rarefied knowledge of shelter and housing relating to disasters, the Project Director will:

Assume overall responsibility for project policy and direction;
Select and devise methodologies and assessment processes;
Be responsible for senior level liaison and dissemination;
Attend the steering committee;
Supervise the production of the final report.

Project Co-ordinator: Roger Bellers
The project co-ordinator will, in addition to the day to day administration of the project, be responsible for the following tasks:

Financial management;
Researching existing reports and literature;
The development of methodologies and questionnaires for fieldwork;
Fieldwork in India and the Philippines;
Liasing with all interested parties;
Developing an agenda for testing;
Organise steering committee meetings;
Writing up case studies;
Writing quarterly reports to be distributed to the OCDS, ITDG and ECHO;
Preparing the final report and co-ordinating dissemination;
Maintaining and expanding links formed by the project.

ITDG

To fulfil and assist with various multisectoral components of the pilot project the ITDG will provide the following:

Technical Adviser: Andrew Maskrey
Mr Andrew Maskrey is manager of ITDG's International Disaster Strategy. His role as technical advisor will be;

To assist in identification and assessment methodologies, provide known information on mitigation methods recognised.

Social Scientist: Dr Nicholas Hall
To assist is the development and assessment of fieldwork questionnaires;
Identification of any gender related mitigation issues.

Communications Advisor: John Twigg
To develop and implement a dissemination strategy relevent to local and national cultural acceptability.

Project Work Plan

Phase 1. (2 Months)

Preliminary Research and Preparation for Fieldwork

* Research into existing written reports, publications and experience
* Gathering of ideas and information from relevant organisations
* Development of questionnaires and methodology for fieldwork
* Contact local officials in Philippines and India in order to plan itinerary.
* Holding of steering group meeting to review project.
* Initial planning of dissemination strategy.

Project Co-ordinator = 40 days
Project Director = 8 days
Technical Advisor=2 days
Social Scientist=4 days
Communications Advisor=1 day

Phase 2. (1 Month)

Field research in the Philippines by project co-ordinator and local counterpart in order to:

* Meet with local counterparts, including government, NGOs and technical experts and study examples of low cost mitigation
* Hold discussions with community organisations, representatives and leaders
* Initiate local work programmes of information gathering
* Investigate and understand local dissemination channels and methods
* Develop testing agenda

The project co-ordinator will work in association with the local counterpart who will provide assistance and advice in establishing contacts with government departments, local NGOs, building research institutes and communities.

A technical expert from the Philippines will visit the field site for the last week of the project co-ordinator's visit. This will be in order to undertake field testing and assessment of the mitigation measures identified by the project co-ordinator.

Project co-ordinator = 20 days
Local counterpart =20 days
Technical expert = 2 days
Social Scientist = 5 days

Phase 3. (0.5 Month)

Write up Philippine case study and prepare methodology for India fieldwork in the light of Philippine findings.

Second steering group meeting to review Philippines research and progress of project.

Project co-ordinator = 10 days
Project Director = 5 days
Technical Advisor=1 day
Social Scientist=2 days
Communications Advisor=1 day

Phase 4. (1 Month)

Field research in India by project co-ordinator and local counterpart in order to:
* Meet with local counterparts and study examples of low cost mitigation
* Hold discussions with community organisations, representatives and leaders
* Initiate local work programmes of information gathering
* Investigate and understand local dissemination channels and methods
* Develop testing agenda

The project co-ordinator will work in association with the local counterpart who will provide assistance and advice in establishing contacts with government departments, local NGOs, building research institutes and communities.

A technical expert from India will visit the case study site for the last week of the project co-ordinator's visit. This will be in order to undertake field testing and assessment of the mitigation measures identified by the project co-ordinator.

Project co-ordinator = 20 days
Local counterpart = 20 days
Technical expert = 2 days
Social Scientist = 5 days

Phase Five: (1.5 Months)

Write up India case study

Draft Final Report

Distribute report to ECHO and other appropriate organisations

Prepare and distribute summaries, articles, etc, based on report

Assess initial response to findings

Third steering group meeting to review final report and methodologies

Project co-ordinator = 30 days
Project Director = 5 days
Technical Advisor=1 days

Social Scientist=2 days
Communications Advisor=3 days

Phase Six: (1 month)

Complete and amend Final Report

Incorporate outline proposal for major project-

Identify Research Locations
Partners
Dissemination Strategies

Disseminate findings of the Pilot Project though country offices and already established networks

Submit major project proposal bid

Project co-ordinator = 20 days
Project Director = 7 days
Social Scientist=8 days
Communications Advisor=4 days

Budget: Low Cost Disaster Mitigation - Pilot Project/ECHO/OCDS.

OCDS and ITDG Staff Costs

Project Director	
- 25 days at £350 per day	£8,750
Project Co-ordinator	
- 131 days at £195 per day	£25,545
Technical Advisor	
- 4 days at £195 per day	£780
Social Scientist	
- 26 days at £195 per day	£5,070
Communications Advisor	
- 9 days at £195 per day	£1,755
Sub Total Staff Costs	**£41.900**

Philippine Case Study

Local counterpart - 20 days	£1600
Local testing expert - 5 days	£400
Daily Subsistence - £75 per day	
- Project Co-ordinator 31 days	£2325
- Local counterpart 31 days	£2325
- Technical expert 7 days	£525
Local travel -	£600
Air ticket London - Philippines return	£1200
Subtotal Total Philippine Case Study	**£8975**

India Case Study

Local counterpart - 20 days	£1600
Local testing expert - 5 days	£400
Daily Subsistence - £75 per day	
- Project Co-ordinator 31 days	£2325
- Local counterpart 31 days	£2325
- Technical expert 7 days	£525
Local travel -	£200
Air ticket London - India return	£1000
Sub Total India Case Study	**£8375**

Miscellaneous Costs

Steering Group Expenses	£750
Production and distribution of report/findings	£1,000
Contingencies	£1000
Sub Total Miscellaneous	**£2750**

Total Project Costs	**£62.000**
ECU RATE on 31 May, 1994= 1.3 ECU=£1,00	ECU 80,600.

Appendix 1

Examples of Simple Mitigation Measures

It may be helpful to identify some typical examples of the process. The following indicate the ingenuity, practicality and economy of such measures:

Those associated with the Pilot Project

Cyclones

- fishermen in Andhra Pradesh, India place their fishing nets over the thatch roofs of their homes when high winds or cyclones are imminent (the nets have weights added to their perimeter as a compensating load on the roof to hold it in place when high velocity winds have a lifting impact).

- in Bangladesh, when there is news of an impending cyclone families frequently bury their valuables, such as jewellery or legal deeds, in earthenware pots which can then be retrieved from the debris after the cyclone has passed.

The following hazards often accompany and increase the impact of tropical cyclones

Floods

- farmers in the Hunza Valley in Northern Pakistan tie ropes across rivers attached to bells downstream so that if a flash flood breaks the rope, bells ring giving individuals a few vital seconds warning to leave the river bank and climb to safety before a wall of water descends.

- there are numerous examples of "village raising" where an entire village is raised by, say, two metres to avoid the impact of a flood surge that can accompany a cyclone in coastal regions as a protection from routine flooding. The pits that are dug to provide the earth for the new platform can then be used as fish ponds providing a useful economic input.

- in Bangladesh families have developed roof platforms for evacuation during floods.

- in Anhui Province, P.R. China subsistence farmers with very low-incomes are protected from losses from floods or crop failures by a co-operative insurance system.

Landslides

- in Jamaica and Taiwan very successful use has been made of disused rubber tyres to stabilise soils on steep slopes. As plants gradually grow in the centre of the tyre which are tied together to form a grid, a highly effective "surface skin" develops which has proved to be a very effective way to reduce landslide risk. The technique also contributes to reducing a man-made hazard of atmospheric pollution caused by indiscriminate burning of old tyres.

Examples from other hazard types to be included in the wider proposal

Drought

- rural farmers in drought prone areas of Maharashtra State in India have developed some highly ingenious "water harvesting" techniques to conserve limited water stocks by devising underground cisterns and other methods.

Earthquake

- examples of social adjustment to infrequent earthquake impact are far less frequent than seasonal hazards such as flood and high winds. However, there are examples of simple devices to tie buildings together by timber ring beams to provide a level of seismic resistance.

Local Level Risk Mapping

- in many areas local families assess the risks they face with some precision. Techniques vary but they include marking high flood levels on bridges or walls of buildings. This data is then used in decisions on building siting, window sill levels etc. Often this process is undertaken by school teachers and their pupils.