Participatory Urban Risk Management

Action Workshop on
Education for Sustainable Development

Summary Report

23-30 July 2006
Kyoto, Japan

Foreword

The impacts of disasters, whether natural or man-made, not only have human dimensions, but environmental ones as well. Environmental conditions may exacerbate the impact of a disaster, and vice versa, disasters tend to have an impact on the environment. Environment-disaster linkage, rural urban linkages are the issues linked to the overall concept of human security. Climate change impacts are often regarded as the missing link between environment and disaster. As cities all over the world are rapidly getting urbanized, most cities have confronted environmental problems such as poor air and water quality, high levels of traffic congestion and ambient noise, poor-quality built environment, derelict land, greenhouse gas emissions, urban sprawl, generation of waste and waste-water. In particular, cities in the developing world face problems related to the living conditions in which the urban population lives. In the context of cities in the developing world, it can be narrowed to the quality of life of living population in the cities. In this regard, “education and learning” is considered to be one of key issues to practice innovative and pro-active implementation measures.

In order to address the issues of urban disaster and environment, the Graduate school of Global Environmental Studies of Kyoto University organized ‘Participatory Urban Risk Management: Action Workshop on Education for Sustainable Development` from 23 July to 30 July 2006 in Kyoto as one of the Programmes of 2006 Scholars and Professionals Invitation Project within the framework of the ACCU Invitation Programme for International Educational Exchange of teachers and Professionals. A total of 34 professionals participated from 12 different countries. Participants included local government officials and chief executives, academic and research organizations, non-government organizations and international organizations/ Foundation.

The learning process consisted of three parts: Training programs with six different modules: (Risk Assessment, Action Planning, Decision Making, Implementation Management, Education for Sustainable Development and Information and Communication Management), Video conference (with participation from Kyoto, Tokyo, Manila, Delhi and Bangkok), and an open forum (an international symposium open to public).

This summary report outlines the presentations of different modules, video conference presentations, major discussion points, and list of participants. I hope that this document will be helpful as a reference material for further training programs and implementation activities on urban disaster and environment management. I would like to thank all the participants and organizers for their active support and cooperation.

Rajib Shaw

Associate Professor

Graduate School of Global Environmental Studies, Kyoto University

Acknowledgements

The organizers of the programme would like to thank the co-organizer Asia-Pacific Cultural Centre for UNESCO (ACCU) for providing financial support for this programme.

We would also like to thank Yomiuri Shimbun for supporting this programme and assist in disseminating the importance of urban risk issues to public readers.

We also wish to thank the all lecturers, resource persons and facilitators who provided academic, technical, and practical inputs throughout the programme. Special thanks go to Nishinomiya-City and LEAF for organizing and coordinating field trip in Nishinomiya and also to Global Development Learning Centre for facilitating Video Conference with Manila, Bangkok, Delhi and Japan.

Lastly but not least, we would like to thank master and doctoral students as well as research fellows in Graduate School of Global Environmental Studies, Kyoto University for their help in facilitating the programme and also their active participation during the Workshop.

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Overview

Introduction

Participatory Urban Risk Management: Action Workshop on Education for Sustainable Development was held at Graduate School of Global Environmental Studies, Kyoto University on 23-30 July 2006. The Workshop was co-organized by United Nations Envrionment Programme, Division of Technology, Industries and Economics, International Environmental Technology Centre (UNEP-IETC), SEEDS, and the Asia-Pacific Cultural Centre for UNESCO (ACCU).

The Workshop was attended by thirteen* overseas participants/resource persons and nine Japanese participants to discuss various urban risk issues emerging recently and to share lessons learnt to tackle such problems. Details of the twenty-two participants are as follows:

MD. Golam Rabbani	Bangaldesh Centre for Advanced Studies, *Bangladesh*
Anshu Sharma	SEEDS, *India*
Manu Gupta	SEEDS, *India*
Fenty Yusdayati	Regional Development and Planning Office (BAPPEDA) Kabupaten Bantul, Yogjakarta, *Indonesia*
Hiroshi Mizoguchi	City of Kitakyushu, *Japan*
Kenta Ono	JICA, *Japan*
Koki Onari	Nishinomiya City, *Japan*
Hiroki Ito	Saijo City, *Japan*
Koji Ishikawa	Saijo City, *Japan*
Kozo Takahashi	Saijo City, *Japan*
Tomoko Takahashi	Saijo City, *Japan*
Yukiko Ito	Saijo City, *Japan*
Masanori Sugimoto	Toyooka City, *Japan*
Mashuti Bin Mat Soom	Malay Agricultural Settlement Administration, *Malaysia*
Jishnu Kumar Subedi	Nepal Engineering College, *Nepal*
Lorna Paras Victoria	Center for Disaster Preparedness Foundation, Inc., *Philippines*
Mohamad Ismal Mohamad Ariff	Mayor of Galle, *Sri Lanka*
Ampai Harakunarak	Thailand Environment Institute, *Thailand*
Ian Davis	Cranfield University, *U.K.*
Le Thi Thuan	Thuan Phuoc Ward People's Committee, *Vietnam*
Gaby Breton	CECI, *Canada/Vietnam*
Nguyen Thi Minh Thu	CECI, *Vietnam*

*Out of thirteen overseas participants, ten were funded by ACCU (excluding participants from UK, Canada and Vietnam –Ms. Nguen). Originally, a participant from China was expected in addition to the above twenty-one participants, however, he was unable to attend the programme due to his commitment in his workplace.

Programme Background and Rationale

The world is facing an increasing frequency and intensity of disasters – natural and man-made – that have had devastating impacts. As reported by the secretariat of the UN International Strategy for Disaster Reduction (UNISDR), the last ten years have seen 478,100 people killed, more than 2.5 billion people affected and about US$ 690 billion in economic losses due to disasters. Disasters triggered by hydro-meteorological hazards amounted for 97 percent of the total people affected by disasters, and 60 percent of the total economic losses. The tragedy is that many of the losses due to such disasters could have been averted or reduced with proper risk management. This workshop aims at developing action-oriented educational material and decision-making toolsets to be used locally by various stakeholders, especially in urban areas, to promote the importance of appropriate risk management. The workshop will particularly focus on issues of urban risk management, need for community participation, and the socio-economic issues, emphasizing the importance of an environment friendly urban area that will lead to a safe and secure society.

Objectives

While there has been tremendous work (project implementation and training programs) on international level, and national policy level, the challenge remains as to enhance actions at local level. To overcome these challenges, the workshop's objectives are:

1. To provide opportunities for participants coming from different fields and countries to share their experiences and knowledge on sustainable urban risk management issues
2. To develop information dissemination methodologies on assessment of urban risk, proactive risk education, decision making for sustainable management, and urban eco communities,
3. To develop learning material and decision-making tools for sustainable urban management to be used by local government officials, development practitioners including NGOs, local decision-makers, and local community leaders.

To achieve the above three objectives, the workshop is structured along the six thematic modules, namely: (a) risk assessment, (b) action planning, (c) decision-making, (d) implementation management, (e) education for sustainable development, and (f) information and communication management.

Results

The results of the Workshop were:

1. Better and enhanced understanding of the interlinkages between environment issues and disaster mitigation at various levels of action,
2. Better and enhanced understanding of the need for multi-disciplinarily in disaster management as a whole,
3. Development of action-oriented educational materials and

decision-making tools,

4. Case study analysis as a model for successful sustainable urban management to understand the various interconnected issues in urban environments and risk management, and
5. Formal publication of six thematic modules developed by the programme.

Proceedings

Day 1 (23 July 2006) – Arrival of Participants

Participants arrived in Kyoto.

Day 2 (24 July) – Opening Session, Keynote Lectures, Video Conference

Opening Session

The Workshop was inaugurated with welcome remarks from Dr. Masashi Kamon, Dean, Graduate School of Global Environmental Studies (GSGES), Kyoto University. While introducing the mandate and progammes of newly established GSGES, Dr. Kamon noted the complexity of global environmental problems and urged cooperation among diverse academia and practitioners.

The Opening Session was followed by opening remarks by Mr. Kazuro Iida, Managing Director of the Asia Pacific Cultural Centre for UNESCO (ACCU). Mr. Iida introduced various initiatives implementing by UNESCO as well as ACCU on disaster mitigation issues and highlighted the importance of education in disaster prevention.

Dr. Hari Srinivas, Chief of Urban Environmental Unit, in the United Nations Environment Programme, International Environmental Technology Centre (UNEP-IETC), gave introductory remarks emphasizing the interlinkages between environment and disaster and importance of incorporation of environmental aspects in disaster risk mitigation efforts.

Dr. Rajib Shaw, Associate Professor of Kyoto University, GSGES, then gave an introduction to the Workshop, stating the background and rationale of the Workshop as well as its objectives and methodology. He encouraged participants to actively involve in the Workshop as shown in the programme title.

Participants then briefly introduced themselves, the cities and organizations they represented and their professional background and their expectation in this programme.

After short coffee break, two keynote lectures were delivered by Dr. Norio Okada and Dr. Kazuhiro Ueta, Kyoto University.

Keynote Lectures

"Disaster Management : New Insights, Perspective and Research Challenges"
by Dr. Norio Okada

In the conventional way of doing disaster management, different disasters were handled by different administrators in the government. Therefore, we tried to take stakeholders involved in disaster management so that the quality of disaster management is increased. This presentation focuses on city/urban issues. Urban disaster management becomes a critical component, and disaster management cannot be better if we speak only to disaster questions. We need to link to urban, regional and community management. We have to think of community management. People attitudes and risk management practices should be studied in adaptive management.

For someone not familiar with disaster management, hazard could be an earthquake, flood, storm that can occur as a trigger. We have people living in exposure. The urbanization pushes the exposure to more vulnerable conditions.

Vulnerability is the object/community as a living body could be more or less vulnerable depending on the way it is managed. So we have a potential victim object, which could be vulnerable. Exposure has very much to do with the vulnerability and hazard to exposure. The stakeholders need to do some thing with the hazard and think of different stakeholders who could be better handling various aspects of hazard. Depending on what we do, we have less or more damage. This is way how urban/regional disaster management takes place.

Five storied pagoda system: the bottom is natural environment, next cultural and convention, social schemes, infrastructure, land use and built environment, life in community. In social schemes we have legal and other systems and schemes such as governance schemes. What is important is as we go down the way it gets changed slower and slower process. Could be one out of 100 years or 1000 years. As we go up, it becomes quicker and quicker. So we need to consider these things as well.

Infrastructure is an important component of the risk. The way how houses are built and some times how houses are built, social schemes and culture. It takes lot of time to change culture and natural environment. So in a disaster management plan, the natural environment should be included as a long-term objective.

Triangle slide: Any city / community /region can be viewed as a living body or beta system. If we want or change the capacity to get prepared to the threat or opportunity we need to think three components to be met in a coordinated. One way is survivability, vitality and conviviality. These three have to be well coordinated to manage the city in a sustainable manner. Our conventional dm plan and management is biased towards survival and tend to cut vitality. Cities would have to collaborate with other cities and communities and so networked which means a more partners working together. Need for urban or regional planning to include more of survival where it has to be a balanced one.

Lessons from the Kobe earthquake, self-rescues are very important. Households have to make their best to save their life. While community has to be managed after the disaster, self-rescue/relief needs enhancement of coping capacity. The coping capacity is not often in the domain of communities. It is a kind of collaborative enhancement or coping capacity. Enhancement of coping capacity is not done if we just depend on only the citizens but it has to be collaborative.

Day to day practice and ownership of knowledge and technology is very important. It can be better managed if we have practice day in the community where they incorporate the competition of who could find equipment quicker than others. Ownership is important as well. Retroactive and proactive management should be coordinated. We found that the implementation should be given importance. Urbanization is at rapid phase these days. Hence, the urban risks are growing.

The participatory approach based on a workshop based method as a PDCA cycle process: we have to start with check of the risk of the community/city then go to the action then plan and then implant the process. Octopus approach is through reducing disaster risks at built environment level. This is done by reinforcing the built

environment. This is supported by secondary action such as nailing the furniture to the wall, broad roads etc.

Collaborative modeling is done by carrying out negotiations among the stakeholders.

Vital rhythms: for the community it is a kind of wave. Disaster could take place very rarely at different frequencies. The way we can prepare for this is through making use of mini disaster that take place frequently and then incorporate the behavior in the plan for larger disasters. The festivals or other imp events could act as memory benchmarks.

Questions and Answers:

Q. How can we make use of festivals and mini disasters for a major event?

- The draft management question comparison of observed SRPD, WSP and simulated WSP. After 10 years of the event, we measured the newspaper reports on the event was measured. The message is like an inverted bowl. We observed the water saving percentage. As the newspaper reports grew the water savings increased. At least tentatively the level of awareness is kept active. SO we can use festivals etc to make people aware so that people can keep remember the events or a message for longer time. The mini disasters such as typhoon, small earthquakes can keep people's memories fresh for longer time.

Q: Pagoda model: at the top is fast and the bottom is slow. It is very interesting way of looking at it. Land use and built environment are at top. While land use in many places is done long back while built environment may be very fast changing. The second one is we are not starting from blank sheet but going from already developed systems of perceptions. We are already advanced in that area. So enhancing the coping capacity is an important term.

- The way land use is changed and the infrastructure and social scheme is carried out and implemented takes more time to infrastructure management. The way it changes /people change is where it is at second level.

Q. I am interested in 'when you said we should manage the multiple hazards. The question is, it is probably easy in urban than rural area as in rural areas the big assumption is the hazards affect in continuous way. Perhaps it is very close to how other areas are what kind of hazards always affect people and how people can plan for the future. People's mind always think what would effect them.

- I agree with you. Density is very important. The lifestyles of rural and urban are different. Sometimes the experiences are also different, the way we can manage disasters in these two areas is different though there may be common things. Spatial management is important in both places. The reason why the different scales and how they can be coordinated is that we have to think of different scale questions. Another taxonomy from rural and urban is scales. Regional>cities/rural>communities etc. may be multiple hazards may be more effective in metros as compared to rural areas but even in rural areas the neighborhood/community we can discuss the multiple hazard questions. In Japan, the local people need to be involved in planning. Communities have knowledge that is different from ours own. So by involving them it is a kind of cross fertilization of ideas.

"Ecological Democracy and Ecologically Sustainable Urban Development in Japan"

by Dr. Kazuhiro Ueta, Kyoto University

Today's discussion is based on extension of my economics background to the social and political development. It includes some economics as well. There are some similarities between disaster management and environment management from view point of sustainable urban development.

The brief history of ecological urban problems in Japan, we only have environment disasters. Because of rapid industrialization and modernization there is serous pollution happening and mainly by mining (e.g. Ashio mining area). There is already an environment disasters in Japan. Post war, the Kogai becase a social problem such as pollution from heavy metal and chemical industries, for example the Minamata disease in 1950s. In 1956 a medical doctor of district company reported to the health center of Minamata city about the disease. Economists say that the koga is failure of markets. But it is not only a failure of market but also the government. In 1950s there is no government agency, which is engaged in environment management. In 1971 an environment agency was established.

Not only the environment disasters, but also the motorization and consumer waste is added to the problem. Especially, in urban areas the industrial areas are very closely

located in cities, the mass life stile is mixed in the urban areas and the problem is very serous environment problem.

The pyramid shows the structure of environment destruction. The top of hierarchy is death and it is extreme phenomenon. At the bottom we have a kind of global change/ecosystem deterioration etc. In urban area, we have destruction of urban amenities. We should more clarify the cause of these kinds of phenomenon of kogai/health damage. The mismanagement of social systems is important. The concept of social common capital explains the kogai effectively. Because of the mismanagement of social common capital the environment disasters are become more important. We should construct community capacity to enhance the social common capital.

Urban sustainability: condition of urban sustainability is that the community has capacity to manage social common capital and prevent the kogai or environment deterioration. The key factor is integration of ecological, social and economic, cultural considerations. The outcome of capacity building of community for managing common social capital is better environment. From kogai to urban sustainability, we have to manage the social common capital. The definition of social common capital is that, there are 3 types of social common capital: environmental/ecological social common capital; social infrastructure including roads; institutional capital.

For me, I believe in natural environment, social management, and ecological democracy.

Systematic understand of social common capital is very important. Also the key idea of how to manage the social common capital is adapted by Prof Uzawa is that the social management of social common capital is based on social criteria. It is just not by government or just by market but social criteria. Of course the government has to contribute a lot. Ecological democracy aims at managing the social common capital.

Ecological democracy for urban development is not an easy thing. The collective decision making system is the fundamental requirement. Participation and environmental rights are important. Economic valuation of ecosystem is different from deliberative environmental valuation. There is assumption that this kind of economic evaluation is based on welfare economics such as willingness to pay and willingness to

accept. These are based on benefits of ecosystem services individually enjoyed. But the ecosystem services usually have communal values.

Deliberation as communication is to be considered. Ecological communication should act as a voice of nature (Dryzek, 1995). Ecological communication should lead to political communication representing the democratic system. Then social communication should intergrate ecological and political communication.

Circular Diagram: Political community and ecosystem can be included together in Europe economies. But the social communication includes the ecological and political community. This communication vitalizes the entire process of dialogue across different sectors especially in the politicians. In Japan, we need to advocate the ecological deliberative democracy in all the actors.

Questions and Answers

Q: We have social capital developed. This is what communities have and this is what rapidly developing in these days. How are we going to integrate this kind of soft capital into materialized world especially in matters like recycle. It depends on how we define ecosystems. Integrating the economic, social and ecological pillars of development is difficult.

- Knowledge and information are critical in the model of ecological deliberative democracy. The role of scientist or specialist should create or produce new knowledge to the space. All stakeholders such as scientist and educationalists should put the information into the social space of EDD. Social capital is popular.

Q: You talk about role of local governments. In reality, political community there are jurisdictions. When we talk of empowering local government. can we have various tools for ecological sustainability.

- We are talking about local urban sustainability. We have to of course talk about global sustainability. There are global and national and local sustainability and inter-linkages. Of course, we can’t construct the urban sustainability and it cannot be built within the urban area but ecological footprint is the indicator of how a city has linkage with the other environments at larger scales. In Japan, we are in the process of decentralization. Till now there are no powers for municipalities. So there are many things to be talked about to create urban sustainability. To discuss these, we need a social space EDD which is the starting point.

- Urban environment is quite complex. But the global ecosystem deterioration affect urban environment to some extent. Scientific knowledge would clarify to some extent. We say it as uncertainty. If we complete understand we can do something. So I advocate democratic system. If we know every thing we can calculate optimal solution. Research community and scientific community should change to the social space so that the problems are overcome.

Q: You stressed the role of political, social and ecosystems in EDD. Is this the model a kind of champion, which has interacting role of many partners. Who are going to lead this process? Who should forge the partnerships?

- The idea is the social movement is needed and is the starting point.

Q. Local authorities have difficulty in taking part in the social space. The central governments have more power and local govt has few powers leading to difficult to cope with the peoples. We are an implementing agency like an NGO so I think we may not be able to take effective participation in this model.

- We need to change the governance system. Decentralization has become a trend.

Q. Where is the private sector in your model, as nowadays the corporations/ private sectors have becomes important role. In Canada an American company wanted to sell some products, which are against environment rules and regulations.

- This EDD is a bottom up approach. One of the difficulties is economic globalization. The definition for a sustainable city / community is that the city/community which has capacity to find counter measure or have endogenous capacity to counter measure to economic globalization. As mentioned, there are multi-level sustainability issues and inter-linkages of these. The real question is how to develop multilevel-tier governance. So, a kind of structure that is local or city based government that has international networks as well.

Comment: It is a complex urban environment and ecological issue. It requires cities to be more innovative. One suggestion is to go beyond traditional methods and to go to a complex networks. The cities should work like multi-national companies as for them to be innovative and build business for it want to be a successful entity. The second thing is, the UN has presented the Global Compact where UN wants to collaborate with the corporate. But this is only between UN and private sector. However, many cities have started cities compact where a relation between un and cities for them to become sustainable. first city in Japan is Kawasaki where cities look beyond their boundaries and going global. So cities are becoming like multi-national companies and become

sustainable. The other interesting is EMS ISO 14001 is being used to demonstrate their urban sustainability and ecological development. Ecological footprints help the mayors to say that 'I want to buy only those products which are ecologically safe'. So it brings so many leadership issues.

Video Conference

In the afternoon, Video Conference was conducted connecting Manila, Bangkok, Delhi and Tokyo/Kyoto through World Bank Tokyo Development Learning Centre. Objectives of the Video Conference was to provide opportunity to share knowledge in urban risk management from different cities in Asia and to develop learning material for different professional backgrounds. Details of the Video Conference were as follows:

Introductory Remarks: Prof Kamon

GSGES in KU is establishing a new horizon in global environmental studies by bringing together various academic fields and bridging the gap among them.

Global environmental programs include complex issues on every scale from global to local and hence the international cooperation is important in the pursuit of true global environmental studies.

Presentation of Prof Ian Davis

- The definition of urban risk management by ADPC includes key words such as: enabling environment. The problem at task is much more serious and needs a SWOT analysis of the problem itself.
- The strengths of urban risks are: housing infrastructure, availability of skills, business continuity and public awareness levels.
- The weaknesses of urban risks are: being away from comprehensive urban risk

management, road accidents and health problems out merit the natural disasters. Others include critical facilities including schools, where the future of humanity can be wiped out, vulnerable hospitals, lack of integration among planning and disaster management sectors.

- Opportunities are: urban risks produce new structures, forms, ways to reduce risks etc. (London Building Act-1666 is one of examples), building from the past experiences (EMI, GeoHazards etc). Urban areas are powerful in terms of political decisions and policy design. Cities are also important economic centers. Ethics is another opportunity (e.g. shelter and safety).

- Threats are: The risk is rapidly moving and it is difficult to target it.
- Six needed actions are: URM must be made s political concern. One needs to encourage the pressure groups, consolidation and sharing of knowledge gained, and greater focus by NGOs on urban safety. Active sharing of information is important than just putting it on the web. One need to review the urban risks regularly (e.g. Hurricane Katrina). This calls for out-of-the-box thinking.
- Managing risks need taking sensible risks. There are risks to be taken in urban risk management. One should not fear them. Mobilize the communities to lift the burden. Developing a dream team is imp.

Questions and Answers

Q. The stakeholder linkages are one of the strengths of urban risk management.

- Many groups and stakeholders have been working on post disaster relief. However, one needs to concentrate on the pre-disaster as well.

Q. How to enhance the sustainability of community based initiatives?

- One of the big questions is community is what happens when NGO or donor agency stops the money supply at the end of the project? To what extent these programs would be sustainable? From one angle, these programs are like artificial respiration and one needs to look at this aspect more detailed.

Q. What are the ways to bring focus on DM as one can see it receiving less attention than it deserves? Are the deaths caused the right criteria to identify the priorities?

- One of the key issues to be learned is that our preconceived notion of risk do not match with what the communities have as they have perception of risk is of day to day in nature. Many of disaster management programs often work on the major disasters.

C. In response to the sustainability issue, in India there is a large program called DRM. This program envisages working with communities and develops their capacities. What the program does is to go through the government system and institutionalize the process there. So, basically the program is implemented by the government and hence the sustainability is ensured.

Q. What is the right staring point for URM? One can see how conflicting priorities the local administration has, such as sanitation, solid waste management etc., when it comes to considering urban risk management as a priority.

- This highlights the role of government. This emphasises that all the activities in the urban risk management should support the local government and be complementary to its priorities rather than conflicting. Mainstreaming is a kind of lost game. It is said that everybody's business is nobody's business. So the role of pressure groups, who keeps the things happening always, should not be undermined. NGOs and communities have a good role to play in URM.

Presentation of Raman Santiago, Manila:

An earthquake scenario was developed for Manila. The study identified the comprehensive vulnerability of the city. The city could be cut off from other regions due to loss of communication infrastructure. Education, information and training were identified as important aspects of risk reduction. The city government started strengthening the important buildings. Disaster risk reduction has been mainstreamed in all the development programs.

Metro Safe Program is to raise the level of awareness and consciousness on disaster risks among the communities. The three components of the program are hazard and disaster information and education (with multidisciplinary character included, e.g. development of an earthquake simulator etc), enhancing the preparedness through deploying the toolboxes containing basic search and rescue tools and equipment, and

training of regional agencies and communities to help themselves if govt fails.

Questions and answers

Q (Kyoto): Is the simulator a box and others can go into it? How about avoiding it to be viewed as just a theme park or a game undermining its educational value?

- The simulators were designed in such a way that they can be moved around. They not only act as simulators but are also helpful to educators and planners who teach risk management. It is also helping as an education tool.

Q (Kyoto): What were the problems in setting up the boxes such as lack of political, provincial, and community support etc. These boxes could depreciate over the time. What backup and maintenance facilities were envisaged? Is there any other role for these boxes other than helping in disaster response?

- The program was supported by the government so there was no political hurdle. The tools included were simple and don't need much maintenance. They are designed such a way that the community can maintain them on their own. The boxes don't have multiple purposes.

Q (BKK): Regarding the tool boxes, a small American NGO came out with an idea of safety boxes with first aid materials and other stuff. These boxes could be buried under ground and be retrieved when needed. The idea is that they can be effective at the time of tsunami.

- Nearly 40 tools are contained in one container and these are strategically located in the city especially at major intersections. The boxes have public instructions and will not be dependent on the government for any kind of management or operation. Communities can easily use and manage them. The markings on the boxes keep the communities alert as well. The concept is simple and can be replicated by other communities elsewhere.

Presentation of Zubair Murshed, BKK:

Much of urban redevelopment is happening without any social reasoning. The urban development in Asian countries is becoming more of growth oriented redevelopment process, with main emphasis on economic growth, without any vision on social and environmental aspects.

The urban municipal authorities in many of the

cities are starved of resources. The major problems effecting urban risk reduction are that the cities are poorly planned and the resources available are not much different from what the cities had years back. Improvements in technical and financial capacities are insignificant.

Risks are contributed by the built environment, concentration effect of the population, monstrous industrial development and non-existent communities. Pollution could be seen as an overlaid problem.

AUDMP addresses 3 dimensions such as strengthening the municipal authorities through building committees, engaging multiple stakeholders such as teachers, universities, students, fire fighters, masons etc through joint forums and focusing on developing community capacities. The process was started with risk assessment and scenario building, risk reduction planning and implementing selected interventions in few communities, and a large-scale awareness-raising in municipalities. The lessons are being replicated in other areas.

Number of disaster risk reduction activities has been taken up in Asia. For example, in Bangladesh, the DM committees were established by ADPC with the help of CARE; national land use policy was developed in SLK; creation of a new disaster reduction department in Thailand; and capacity building of fire frighteners in the Philippines cities.

Mitigation measures such as land use planning in SLK, community based initiatives in BD and Cambodia including building of small culverts and embankments have been taken up. Masons were trained in SLK, Indonesia etc coupled with public demonstrations. Public awareness through drills, brochures, role plays, talk shows, rallies, exhibitions, songs, television programs etc were organized in many of the program areas. In Nepal, shake table device was developed to raise the awareness among the communities. Disaster reduction education was introduced in Lao PDR. The risk scenarios were prepared and disseminated to all the stakeholders. The Universities in 8-9 countries have included urban disaster risk reduction module in their ongoing educational programs. The safer cities document has become an important tool in many parts of the world.

Questions and Answers:

Q (Kyoto): Involvement of policy makers in disaster risk reduction awareness generation programs has been a challenge. Is there any idea to overcome this problem?

- The best way was to make the message short and crisp. Many times these functionaries were involved as honorary guests and made them to deliver key note

addresses which make them to think about it even for a short while.

Q (Kyoto): What happens/what can happen when there is no concept of communities in cities because people come and go in urban areas?

- It is a challenge. In rural areas there are horizontal communities and urban areas have vertical communities in the form of women unions, youth unions, elderly unions etc. These groups could be engaged them in the process. Other key institutions are schools as demonstrated in Nepal experience. Schools could be the best points of entry to the households.

Q (Delhi): In India, the CBSE has introduced disaster management education in 8, 9 and 10the standards. The state of Gujarat is planning to introduce the same in standards 9 & 10. Is there any idea on which grades could have the disaster management as a subject?

- The decision lies with the national DM committees and educational systems. Consultations play an important role in prioritization of hazards in the syllabus and what and how much information can be included.

Q (Tokyo): In Japan, the final decision of evacuation is made by the Mayors and not the central govt. There has been clear shift towards decentralization and involvement of communities in the disaster risk management planning and implementation and it is clearly visible in various programs of the international entities such as JICA and ADPC.

- It is imp to not to consider communities as independent entitles who can survive on their own. One should consider the limited capacity of the communities in understanding the risks and means of handling of them. For e.g. the communities often lack the knowledge on what is happening at the watershed level. This necessitates the capacity building and involvement of more players who have better and broader understanding of the risk.

Q (Manila): Capacity building programs aiming at policy makers are often failure. How to deal with this problem?

- This is where the role of retired politicians and community leaders comes into picture. Success could be achieved if such programs use the services of these forgotten heroes as they have the political psycho and could be handy in designing the programs. The success is also dependent on the dynamism of leaders where the such programs have been implemented.
- One should also understand that most of mayors come from different backgrounds and they don’t necessarily share the same opinion. They are very busy community and have tight schedules to meet. Though the training and awareness generation programs are valuable and can enhance the knowledge, one need to make extra efforts to make them more useful and attractive to the leaders.

Presentation of G Padmanabhan, Delhi, India:

The UEVRP has been implemented in the cities with population above 0.5 million. The components of the program are enhancing the awareness, developing preparedness and response plans at the community level, development of techno-legal regimes for the states, training and capacity building at all levels and creating knowledge networks.

The traders associations, schools and ward welfare associations have been targeted for developing the preparedness plans. At the national, state and sub-state levels the appropriate authorities were identified and involved in the program. The response officials, private sector, utility companies, civil society organizations, resource institutions etc have been actively participating in the program as they were given clear roles to play. All the stakeholders are linked through a web based information base. A major breakthrough has been working with the schools. In Delhi alone around 800 schools have prepared school safety plans.

Questions and Answers:

Q (Kyoto): An approach in community based DRM is to involve the schools. Schools help in two ways. Through schools one can get to the children and their parents as their awareness is enhanced.

- Various methods have been used to popularize disaster risk reduction in the schools. For example, painting and poster competitions and mass signing of the posters etc have really pickup the momentum.

Q (Kyoto): There is a limit to which school children can be involved in disaster risk reduction. For example, in hazards such as earthquake it is the building that needs to be strong and there school children may not be having much to do. Cities are expanding at a rapid pase. Is it doing any good?

- Unfortunately urban expansion is not bringing any good news.

Q (Kyoto): India has huge number of civil society organizations and they have technical and social capacities. How these are being used in the ongoing program of GOI? What is the specific role of corporate sector in this entire scenario?

- The corporate sector involvement has been sought through FICCI. The FICCI has

been conducting awareness generation programs, development of educational materials and establishment of a specialized cell that provide advocacy to the industries. Onsite and offsite plans are also being encouraged where in these plans are integrated with the district disaster management plans. Consultations have been conducted at city level to form city disaster management committees along with the task forces. Here, all the stakeholders have been involved. Lot of NGOs are being involved in the process of bringing the communities and preparing community based disaster management plans. Media has been involved through cable TV etc.

Presentation of Hari Srinivas, UNEP:

The complexity of urban environment is difficult to understand. This calls for rethinking of urban areas. Many of the global environmental problems can be traced to the urban areas. Such traces are linked to the urban life styles.

The progression from individual to global environment has lot of overlapping areas and causes. There is a need for a comprehensive approach to the city problems. The environmental dimensions of the cities include natural environment, socio-economic and built environment.

The urban management community has number of tools such as world charter on local governments, LCA, EMS and ISO 14001, urban planing rules, Kyoto Protocol etc to look at their environment in their vicinity. EMS has been popular with the private sector to enhance the profits while maintaining or even enhancing the environmental health. Cities also started to adapt this EMS to be more environmentally sustainable. The GET tool has been used in Philippines, China and Indonesia to look at urban environmental issues in a more comprehensive manner.

Disaster management professional often fail to realize the cyclical inter-relationship between environmental management and disaster management systems. Often the emphasis has been on the preparedness while in many cases the risk problems are due to the badly managed environment. The conclusion could be the better management of local environment to reduce the vulnerability to and impacts of the disasters.

Questions and Answers

Q (Delhi): Many environmental management tools could be used for the disaster management.

- Many of the urban environmental management tools could be easily adapted and used in disaster risk assessment. Classical e.g. is being EIA which includes disaster proneness as a component. Similarly, a disaster management tool could include environment as a major factor.

Q (Tokyo): Can population and poverty be considered as root causes of environmental deterioration?

- Population and poverty need not be a problem. The way the policies are developed and implemented constitutes majority of the problem than the poverty or population perse. Poverty is a result of many other problems and it in itself may not be seen as a problem. For example, the low income people degrade the immediate environment while the rich people degrade far away environments. So the degradation of the environment is the result, anyway. What is important is looking at the inter-linkages everywhere.
- Interlinking various issues and making those links visible makes the life of environment and disaster managers easy. One of the key responsibilities of these communities is to look at the linter-linkages and advocate a Mayor on how he can solve the problems. One needs to build creative thinking to solve real life problems.

Comment from Prof Masami Kobyashi, KU:

In the past, the cities have always been designed and managed by the governments.

After 1995, there has been dramatic change in Japan and now it is talking about community based city planning and management.

ADPC has been focusing on community based approaches and it is based on their experiences with people in developing countries. Lack of social environmental sphere, growth oriented development and industries are the basic problems, as was identified from the work of the ADPC. Lack of communities in urban areas is another major problem.

Important key words/ carry-home messages:

- ☑ Building safer urban environment is possible by considering the environment, social, economic, ecological and disaster aspects.
- ☑ 3 major steps could be:
    - Assessment of the risk
    - Planning risk reduction activities, and
    - Actual implementation of the plan on the ground.
- ☑ Communities should not be viewed in isolation. So one need to look at the civil society, academic institutions, and international agencies that facilitate the whole process.
- ☑ Implementation could be successful if the plans and actions are based on the ground realities.
- ☑ Schools have come out as important strategic locations for effective disaster risk reduction.
- ☑ Facilitating policy environment is even more important to enable decision making.
- ☑ Network of the institutions is more important as much as the institutions themselves.
- ☑ SWOT: Lots of keywords such as housing etc could be thought out. Important is that we are not working on the clean slate but are based on the past experiences.
- ☑ Ethics makeup another important issue all together.
- ☑ Education, planning and preparedness are the key elements for the process formulation and implementation.
- ☑ Pragmatism, proactive and open minded thinking is called for so that one learns from other experiences which are often forgot.

Official Reception

Official reception was held in the evening of the second day in the Italian Restaurant near the venue. The event was to provide opportunities to participants to interact more each other in a relaxed atomosphere.

Day 3 (25 July) – Module 1 and 2, Group Discussion

In the morning, Module 1 and 2 was conducted. Lectures were provided by Mr. Fumio Kaneko and Ms. Lorna Victoria. Details of the Module 1 and 2 are as follows:

Module 1: Risk Assessment by Mr. Fumio Kaneko

Purpose of the module is to share a risk assessment experience considering that hazard is natural but risk is local. Referred Chinese proverb "to know enemy and to know own, every fight should be won". In our case, enemy for risk assessment is hazards, our own represents knowing our capacity followed by strategy, action, check, and thereby improving sustainability. Risk assessment is the first step towards planning for disaster management which underlines the fact that hazard is a natural phenomenon, hence not always affect the society. Hence, if there is no building and population, there is no risk. On the other hand, lesser the preparedness, higher the risk.

Risk = hazards X (elements X vulnerability)

Elements represents exposure to assets and vulnerability represents weakness against hazards. Probability of an individual dying in any one year reveals that it is highest for a person who smoke (10 cigerattes a day, chances of death are 1 in 200) and lowest with certain natural hazards. About 20 years back, United Nations defined hazards as natural phenomenon, elements as population or buildings, vulnerability as weaknesses and risk as total consequence of hazards to society. Various terms associated with risk assessment include their analysis and management also. More important is that for different professionals, the meaning of these terms varies. For example, and engineer think of only structural risk but may not think of suspension of certain social activities which are easily visualized by social scientist.

- The essential components to be quantified seperatively in the determination of risk are (a) to know hazard occurrence probability (likelihood at location with magnitude…etc.) (b) elements at risk (
  people, buildings, estimating economic value of them) (c) vulnerability of elements at risk (based on level of hazard, how damage is occurring)

- How to assess risk: Damage to society on y axis and Intensity of Hazard on x axis, curve showing increasing vulnerability
- We cannot reduce hazards (but can check the history of hazards in the area). All we can do is can reduce risk by improvement of elements and vulnerability (for eg. Moving houses to safer locations). REF: In Japan, people prefer convenience, but sometimes over conveniences makes them more vulnerable.
- Hazard evaluation: Need to know the probability of occurance of a hazard of a certain level of severity, within a specific period of time, in a given area, severity (magnitude of hazard, effect site etc.) REF: Table by Coburn.
- Principal elements vulnerable to specific hazards : identifying principal; vulnerable elements (both tangible and non-tangible) to various natural hazards. REF: Coburn
- Examples of Vulnerability: Japanese example of relation between tsunami and death rate (village wise deaths by tsunami) which suggests that one need to identify social characters to establish this context. REF: Kawata

- Loss (risk) parameters for risk assessment : referring to consequence and measures along with losses (to tangible and non-tangible). REF: Coburn
- Risk Management concept for disaster countermeasures in Japan: the figure presented shows that for minor hazards, hard countermeasures are sufficient but for severe hazards, both soft (eg preparedness) and hard measures are important . REF Kawata
- Risk assessment: earthquake is considered as an example for this assessment, because for other hazards, methodology is not so sophisticated. For earthquake Hazard (magnitude, location, probability of occurance, ground motion etc), vulnerability (soil softness, thickness), element at risk (number of buildings, population etc), risk (direct and indirect) were explained. Collateral hazards following earthquakes eg. liquefaction, landslide, subsidence of ground etc.)

- For earthquake risk (loss) estimation freely available softwares are GESI (developed by GHI), RADIUS (developed by IDNDR), HAZUS (developed by FEMA only for USA) and some other tools developed by insurance companies etc.
- GESI: most simple evaluation method for loss estimation designed for worlds major cities. This tool can also evaluate risk for schools and school children. Its mainly targeting developing countries. About 20 cities (mainly from Asia) are evaluated using this tool. It takes long time (average 18 months) and requires various data collection and corrections. Finally GESI presented total earthquake lethality potential for these 20 cities. One of the most mentionable point about GESI tool is that it can identify which particular factor is a major weakness in the city. For example, Delhi ‘s weaknees lies in its poor buildings but for Sam Salvador weakness lies in landslides etc. interestingly, if 5% of the most poor houses are strengthened in both the cities, Delhi vulnerability will not improve much but for Sam Salvador, it will improve significantly. Similar analysis can be done for schools also.
- HAZUS methodology is very sophisticated, requires vast amount of data, engineering oriented, uses GIS. This is mainly done for USA cities but some Indian cities (eg Dehradun) also tried to apply this. It takes time, money and software.
- Comparison between RADIUS and HAZUS shows that farmer is the first approach, can be done by using Microsoft excel, and has world wide application, but for later it is a detailed approach, need GIS and is expensive.
- RADIUS tool discussed in detail and it was informed that the users are mostly city administrators to facilitate preliminary estimation of earthquake damage. In developing countries, the purpose of RADIUS is to raise awareness particularly in seismic vulnerable cities. This tool is very simple as only uses Excel-97, and can even be tried with virtual data. Example of Kobe was presented showing general flow of earthquake damage estimation including seven steps.
- It is emphasized that risk assessment is the first step to disaster management. This is not only useful for calculating risk but also for action planning and get effectiveness of measures. Similarly, involvement of technical people, decision makers and general public is very important in RADIUS tool. There coordinated efforts are key to success.

Discussion:

Q: Are these tools are only for Earthquake or for other disasters also?

- In last 10 years, focus was only on earthquake but now Carlos (working with UNDP) is trying to develop this for other disasters also like flood, cyclone etc.

Q: Prof. Okada mention that multiple hazards can be managed at one time. Is it true? As this involves both dynamic and static effects and hence make it difficult.

- Key point is vulnerability, so if we know the vulnerability to various hazards, we can do multiple hazards analysis. Moreover, time series risk analysis, as well as economic loss estimation is possible. It requires significant time and budgets. This work will be quantitative but analysis is qualitative.

Q: Relating to probability of deaths by different hazards. What is acceptable or unacceptable risk?

- Anshu: Brian Tucker of GHI said different communities has different levels of acceptable risk eg tighting seat belt in car is acceptable risk in south asia but not is EU.

Q: Relating to probability of deaths by different hazards underestimates (or completely ignore) building and infrastructure loss and only limited to number of deaths.

- Ian: acceptable to whom is a question and who decides. For example north sea flooding in UK London has 1 in 700 years of flood protection meaure, other city has 200, Holland has 10000 years. Why because third of Hollands landmass is below sea level and hence prevention is politically acceptable. Similarly, in Thailand, every year 45000 lives lost but such huge loss is not acceptable in Europe.

Q: RADIUS tool, for building is Kathmandu how it fits in for different buildings.

- Vulnerability must be addressed case by case, location etc but RADIUS is made for world wide use. Kaneko did kathmandu valley risk assessment in 2001-02 and identified 8 categories of house (from adobe to concrete structures).

Q: Why we define acceptable risk? Ideally there should be no risk or zero risk. Is it fare to say how much risk is acceptable.

- Ian: in architecture and engineering field, we do accept certain level of risk. Design standards are made to save life an safe collapse of buildings.
- Kaneko: until 10 years back in Japan, architects and engineers want no structural damage to buildings, but later found it non-realistic. Now realized that saving life with safe damage to buildings is both economical and acceptable. It depends on who, where, when.

Q: In Nepal, we give higher design order importance to design of hospitals then

residential buildings. Residences may collapse but hospitals should not.

- Not only structural issues but factional issues are important.

Q: Perceptional differences. We have high-tech risk assessment methodologies like microzonation, followed by RADIUS, and most simplified GESI. Now, ADRC presented town-watching proforma which is even more simplified. Till what extend over-simplification is acceptable? Example of Orissa, where there is no urban data available, hence has to pick base map, divide into grids, drove through the town and assess risk. Is it acceptable?

- In Japan, detailed seismic microzonation is being done for preparing action plans and for preparing countermeasures for future disasters. However lack of communication between technical and administrative people exist and hence its not been used effectively for disaster planning. GESI also includes countermeasures hence is more useful for local level administration. Hence level of acceptance can not be defined.

Q: Risk assessment should be as precise as possible but while implementing, one can target phased reduction of risk.

- Lorna: Risk assessment should be technical but more important is communicating to people. Moreover, for people living in flood planes know the risk of flood but risk of livelihood for them is more important then risk of flood.

Comment: Namibia building are same as Russia. Risk assessment is broad concept and should involve both pre and post disaster considerations. Peoples preparedness before and after the disaster varies significantly. Hence these aspects must be considered in risk assessment. This point out that the subject is still not very well organized and we need more linkages like this.

Module 2: Action Planning by Ms. Lorna Victoria

Community is not that homogeneous group. It consists of children, adults, old, women, disabled, farmers etc. So they look at the risk in different way. The CBDRM is for sustainability and is through building the capacities through building on what they have. Plan is a roadmap to transform from vulnerable to non-vulnerable state. Action planning is an incremental improvement. This is because of

our own limitations in understanding of the risks and ability to consider all the risks in one go. Action planning is a series of actions to induce others to act and to join in the action and pursue further actions. The goal is disaster resilience and sustainable development. UN-ISDR framework considers the society by reducing the hazard risks for sustainable development.

Disaster risk management action planning is participatory, short-term, visible, output oriented process that enable urban community groups to plan risk reduction action or development in their communities and to lead the implementation of such action plans.

Steps in formulating the DRM Plan

- Hazard vulnerability capacity assessment (risk assessment)
- Identify the objectives and targets of DRM plan
- Determine the resources needed
- Determine schedule and deadlines
- Assign responsibilities for activities
- Identify and address critical elements and barriers to plan implementation
- Lay down operational procedures and policies
- Discuss with community members and other stakeholders
- Implementation, periodic review and plan improvement
- Continued progress in ensuring safety, building resilient and attaining sustainable development.

Discussion:

Q: Community is not homogeneous, how to come up with a decision?

- From the out put of risk assessment, communities have a chance to discuss, to prioritize and then develop the time table and call for support from outside if beyond their capacities

Q: Do communities assign the leaders or who will be the leaders? Do they act as the facilitating leaders or commentators?

Q: Why in the Philippines, the participatory approach is so well recognized and practiced?

- Maybe more democracy, teaching techniques. Need technique analysis and community participation. They are not conflict but complementary.

Comment: In Bangladesh, community is not defined, and children are normally the most vulnerable group. However, most of community participatory plan do not include children. We should talk to children, start with children. As a result they can help to reduce the disaster risk

Case Study presentatioin

In the afternoon, case study presentations were made by Mr. Masanori Sugimoto from Toyooka-city and Mr. Jishnu Subedi from Nepal.

Case study from Toyooka-city

Toyooka city (Japan) population is 92000. River Maruyama flow through middle of the town, which is usually calm but broad river. Time series account of how warning of flood is communicated to the city populous was discussed in detail. In this disaster 150 meters of dyke was broken, whole areas sunk in muddy water, and also got damaged due to landslide. From nearby forest, large number of trees were uprooted and carried to residential areas.

Means of information and transmission:

Emergency Radio System was in place and each house in the town has a receiver to this system. Main office of disaster management in Toyooka can send message to all city residents at same time. In the series of events on 20th October 2004, at 3 PM heavy rain started and at 4:10 toyooka natural disaster management (main office) was established. A detailed sequence of warning dissemination was discussed. At 6.05 evening,evacuation notice was served very calmly. By 6.20 Pm, the number of areas in the city receiving evacuation warning were increasing. Finally, at 11:15 in the night dyke was broken. City Mayor as as Head of natural disaster office of the city has encouraged community efforts and assured them best efforts in administrative part. There were significant concerns about the warning / evacuation announcement. Particularly it was pointed out that warnings were calm in nature (to avoid future

consequences). Moreover difference between evacuation warning and evacuation order was not clear. Mayor of the city has played a major role, as he is the one authorized to give evacuation orders. Still, strikingly, in spite regular alerts at almost hourly basis, and broken dyke, evacuation orders only effective to the tune of 10% (of those who were in danger and responded to evacuation order). 27% of the people thought that it was not a real danger or disaster.

The town received lot of mud and silt and wooden logs from the nearby river and forest. Many houses submerged and collapsed in this process. However, casualty was still very less despite enormous physical losses in the city. After the disaster, the local government has analyzed the situation in detail and learned many lessons from their experience. First concern was that due to its calmness in evacuation announcements, citizens could not feel the emergency. Hence the community response to evacuation was very much low. Now government is thinking as how to encourage people who didn't respond earlier. Procedure for such warnings are improved and informed to everybody. Information procedure is also improving to include that information as how much the dyke is overflowing etc. It is recognized that for the government its not possible to save all hence even individuals must be made understand their responsibilities. Now, oriental white stark (a bird) is reintroduced in the city after 40 years and message is served to save natural resources. Ultimately it was highlighted that peoples ties with people lead to save their lives.

Discussion:

Q. Was there any protest after the disaster got over?

- Not really, but citizens demanded improvement and shown their readiness to receive the information from disaster office, which lead to enhanced coordination among people and government.

Q. Who has announced that emergency is over?

- There have not been any announcement to declare normalcy. However, people were advised as which areas they cannot go and which streets they cannot cross. Example of heavy rains happened in the areas near 21-22 July 2006 was given which proved that new system worked well.

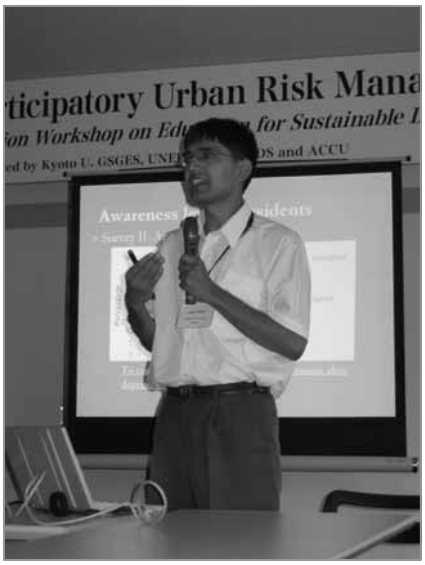
Q. what is the emergency radio system in the city?

- This is a special provision made by city authorities for disaster related warnings. This radio system is also used for providing useful city information occassionaly.

Q. Explain the phrase “the very principal problem” used in presentation on page four.

- The city is placed at low level comparing to sea level and such devastating flooding is not a regular phenomenon. Principal problem corroborates that there was stock of emergency material at certain designated places however because of the road blockage it could not be distributed efficiently.

Case study from Nepal



Presentation started with explanation of poverty-disaster vicious circle showing that only 11 % natural hazards occurs in developing countries but the loss is 53% clearly represents that worst affected by disasters are always low income economies. It was mentioned that water induced disasters (400 disasters in last 20 years) are more frequent than earthquakes (last major earthquake occurred in 1934 took 10000 lives in the Katmandu valley). Katmandu valley houses three municipalities in its fold namely Katmandu, Lalitpur and Bhaktapur with total population of 1.5 million. There are two studies done to assess earthquake risk damage in the valley respectively by JICA and ERMAP(1998). Former study estimated 21 percent building damage whereas later predicted the building damage to the tune of 60 percent.

Nepal building Code has came into effect from the year 2004 popularly referred as NBC-2004. A study is conducted through survey of 30 engineers, architects and planners practicing in the valley. These practitioners were asked as whether they are satisfied with current design, implementation and monitoring practices for NBC 2004 and the answers were 50%, 26% and 0% respectively. Level of awareness among residents and construction workers was very low however municipal corporations have higher level of awareness.

Another survey based study involving interview of 1280 households was also carried out recently. This study reveals that 50% of the surveyed population agree that a large scale will definitely occur in the valley in next 10 years but 50% believes that it is due to their Karma or fate. Interestingly 60% people agreed that their house is not safe for the earthquake and 70% of them know the safer places nearby. Both the studies revealed that in spite active seismic activities in the region, seismic safety gets low priority in construction.

Discussion:

Q. Why the reinforcement is not done properly?

- Probably it is linked with the concept of acceptable risk. For example, annually 1000 people die in floods in rural and fringe areas in Nepal but lesser impact is seen in urban areas. Similarly due to lesser perceived damage to earthquake, construction flaws with reference to seismic construction is continued.

Q. Do Nepalis believes in Karma or such supernatural acts of god?

- Because of low level of literacy (35-40 percent) these superstitious beliefs are very much common in Nepal.

Group Discussion

During group discussion, participants were divided into three groups; a) local government, b) NGO, and c) community and each group were assigned to create the scenario of a simulated city and discuss ways to make it safe through risk assessment and action planning. Each group was requested to assess situations and come up with analysis and proposals from their respective stakeholder view point.

Plenary session

Group (a): The city Kyoto Putra has a population of one million in a geographical area of 300 sq km. The major disaster risks are river and coastal floods, tidal inundation,

earthquakes, cyclones and tsunami. The government plans to establish disaster management plans at all the levels and encourage flood early warning and dissemination involving communities. There is a relocation plan for the vulnerable ones including squatters at a mutually agreed location. The relocated communities would be provided with the livelihood options as well. The river will be straightened to reduce the floods as the river water can each the sea faster. The DM plan envisages training communities, NGOs and government mechanism on various disaster risk management practices, including conducting mock drills etc, and formation of DM teams and committees at all levels. One of the important aspects of the longterm plans is establishment of DM fund and risk insurance. Private organizations will be encouraged to identify the modalities of risk insurance. DM fund would be established from the state finances and surcharge on the taxes.

Q. Isn't the relocation of slums a challenging task?

A. The relocation of slums and squatters is certainly a challenging task. However, it would be done through a planned approach of awareness generation first and through appropriate incentives such as livelihood generation options etc.

Group (b): The city is named after three countries. The city has a diverse physical conditions such as mountains, river, and sea and has hazard risks such as coastal floods, river floods, earthquakes, tsunami, typhoon etc. The disaster risk areas were identified clearly. The first area is in the sub-urban is often affected by forest fires in the dry season and land slides in the rainy season. In area No 1, it is estimated that around 2000 people will be affected by the forest fires and land slides in an area of 500 ha. The main hazard in the center of the city is earthquake and 90% of population is vulnerable. Around 500 people are affected along with the river floods in the central area. The slums are located near industrial location and are vulnerable to tsunami, floods, typhoons and earthquakes.

Solutions: Short term actions are awareness generation among the communities using radio, city newspaper etc. The information provided by some institutions could be

difficult for the people to understand. Hence, NGOs will talk to the government to provide info through appropriate channels filtering the high-technical content. The 2nd solution could be formation of community forum where events are organized to raise awareness. One such example is organizing photo contexts on the importance of forests.

Longterm solutions are organizing school education programs, curriculum development for the schools, organizing associations among the stakeholders, to help give bargaining power, and building training modules for safe housing etc.

The role of NGOs could be targeting vulnerable areas and dissemination of information efficiently in vulnerable areas. NGOs could also act as coordinating mechanism among various social and religious groups. NGOs could also provide innovative ideas to the problems.

Q. NGOs act as pressure groups in Bangladesh. Hence, NGO should have specific strategy to address 90% of the vulnerable people and how do you wish to integrate the strategy with the government?

A. Since some of the activities are carried out by the government, it is said that the NGO will follow an integrated approach.

Group (c): The city has a population of 40,000. Earthquakes, tsunami, landslides, water pollution, industrial pollution, and squatting are some of the important problems in the city.

Short term solutions are: Awareness generation for communities with evacuation plans and provision of hydro-met meters along the river to monitor flood situation. It is assumed that the community has no capacity to solve the problem of pollution. In a recent tsunami, the fisher community

were affected. So, it was planned to plant trees and construct dyke along the coastline. Water purification plants would be established at a place where water pollution is a problem. The problem of landslides will be solved by preparing evacuation plans and by training communities. The problems of traffic and solid waste will be solved by mobilizing community by voluntary collections. Lot of support is expected from the government.

Q. Is it practical for communities to do all?
A. All these examples are from Vietnam. In Vietnam, the communities planted the shelterbelts with the support of the government.

Day 4 (26 July) – Field Trip to Nishinomiya-city

One-day field trip in Nishinomiya was conducted on 26 July. Participants left the hotel at 9:00AM by bus and arrived in Nishinomiya at 10:15AM.

The first visiting site was Koshien-Hama Shizen Kankyo Centre. Participants received presentation from Mr. Onari, who was one of the workshop participants, about the environmental learning concept Nishinomiya-city has been implementing. In December 2003, the city declared itself as an “Environmental Learning City”, the first of its kind in Japan. This declaration is a cornerstone of the city to publicly announce that the “sustainable community development,” which is a permanent objective for human beings, has been identified as the basic principle of city planning, and “environmental learning” has been recognized as vital for civic activities supporting such principle. The declaration has also built the foundation of partnership for collaborations among community sectors such as citizens, businesses, governments, schools, and NPOs, in developing various community-based activities. Under the concept of the “community that learns through the environment,” existing public and private institutions, as well as natural fields in the city, have been identified as environmental learning venues. Training seminars for supporters on civic learning activities, and environmental learning systems related to each civic sector and each generation have also been established, so that

“environmental learning” will serve as a driving force of community building. There was also a speech from a representative of citizen’s group on how citizens together with the city have been working for the protection of natural beauty of Koshienhama over the decades.

Later in the morning, participants were free to tour inside the Centre which has many interesting displays where children can learn about environment and nature of Koshienhama.

Next visiting site was “Kabutoyama Shizen Kankyo Center”. After lunch and short break, participants received presentation by Mr. Ogawa about the activity of LEAF. LEAF is a local non-profit organization (NPO) which promotes environmental education to children in partnership with citizens, private sectors and local governments and unlike other such NPO, it has wide varieties of membership especially from private sectors. Several such members were present during our visit to Kabutoyama center and participants received brief introduction of those members from private sectors and how they support the activity of LEAF. One member company is producing fabric from PET bottle recycling and the member explained how the fabric was made. Participants were surprised and interested with the technique and asked many questions such as cost-effectiveness.

Then, participants were taken to an agricultural property where LEAF manages. The property and agricultural products were maintained by LEAF together with retired local citizens who volunteers to work. Harvested products are shared with local citizens and used when community activities take place. Children also comes this place to learn agriculture and environment.

The third visiting site was Hakushika Sake Museum. The museum was heavily damaged at the time of the Great Hanshin Awaji Earthquake

(popularly known as Kobe Earthquake) and there was an exhibition to show the destroyed properties and tools. There were many other exhibitions where participants could enjoy to learn how sake was made in old times.

The last visiting site was LEAF office in the downtown Nishinomiya. Participants bought their own dinners at nearby supermarket and had a light get-together party at LEAF office. Participants enjoyed interacting with members and staffs of LEAF and also tour LEAF office which also has mini-aquarium which displays life specimens from the local environment.

Participants left Nishinomiya around 20:15 and arrived in Kyoto around 21:30.

Day 5 (27 July) – Module 3 and 4, Group Discussion

The morning started with a review of the filed trip which took place yesterday. Couples of comments were as follows;

- The best experience was seeing how people and organizations made school children participate in the program and how community members plant rice crop together.
- The education system in the program is quite interesting.
- Green system and other icons made to impress the people is very impressive in Nishinomiya. Private sector involvement in the entire process of dissemination of knowledge is interesting too. Leadership in this city reflects all activities taken up there. In Vietnam, as a leader it is difficult to approach and involve private sector. The elected representatives can only take decisions related to communities.
- Integration of risk reduction activities in each sector is interesting.

Then, Module 3 and 4 lectures were provided by Dr. Hari Srinvias, UNEP and Mr. Hidetomi Oi, JICA respectively. Details of their lectures were as follows;

Module 3: Decision-Making by Dr. Hari Srinivas

- Every disaster has in its origin an environmental problem as its starting point or disaster lead to environment degradation. So while preserving environment we also contribute to disaster management. Environment and disaster has a cyclic link and largely disaster management is essentially at large environment management.
- When it comes to decision-making, everything we do has an effect on environment. Through cause and effect diagram, it is further established that every decision one takes has some cause in its root and certain effects as its ultimate outcome. Hence, understanding all dimensions of decision-making is a challenge.
- Decision making pyramid revealed that how decisions taken at various levels are interlinked. These levels start from individual to city, national, and even at global level and varies in their impact and effect. At the individual level, decision making is simple and requires low level of information whereas global level decisions represents complex decision making, are infrequent and are long term, takes long time and decisions are taken by the group (eg. UN, group of countries) and requires significant information.
- The way our individual level decision-making influences global level environment in turn requires global level decision-making. This is well understood with Kyoto Protocol. Hence, both levels have influence on each other, affect each other, and have cyclical interference. Another example is Montreal Protocol on Ozone depletion, which is a global level decision but has influenced local level decision making by modified refrigeration systems.
- Another example is Kyoto Protocol, which is targeting to reduce carbon dioxide emissions is further broken into everyday collective decisions taken locally posing a big challenge. Similarly, reducing disaster impact at local level is a challenge of

decision making. Global decisions are taken together and can be implemented at local level.

- It is very important as what to be communicated at local level. For example conveying global warming at local level may be inappropriate but can be communicated with examples like waste reduction or non-intensive refrigeration.
- To understand the decision, it is important to define the problem followed by finding the information. For example, during the disaster, we need a person to behave in a particular way, which is possible only if the right kind of information is conveyed.
- Processing of information is equally important as only a part of all information collected may only be usable and may require to support with additional information as well. Further, value adding to information is also important to fit to audience.
- Finally taking the decision completes this process however not just decision alone but monitoring and action for decision is equally important.
- Principles of decision making:
    1. Purpose driven: eventually change life style and consumption pattern.
    2. Inclusive (not exclusive)
    3. Educational
    4. Voluntary
    5. self designed
    6. Flexible
    7. Egalitarian
    8. Respectful
    9. Accountable
    10. Time limited
    11. Achievable
- Steps is risk management requires internalization of many decisions.
- Decision making to reduce environmental risks requires compliance, technical sustainability, environment resources and emissions, economic and financial aspects, social and cultural aspects etc.

Discussions

Q. I worked as architect for 15 years and in disaster management for 30 years and experienced that information flow may be insufficient or incomplete to support decision making. In this condition, how you recommend to make a decision?

- Packaging information properly, bundling the collected information (be it huge or small) but selecting right one to make decision is more important.

Q. Sometimes policy makers are forced to take certain decisions in spite they are aware of different reality. People possessed with two kind of knowledge: implicit and explicit. What you suggest?

- Providing right information to right people at right time is most important.

Module 4: Implementation Management by Mr. Hidetomi Oi

JICA'S involvement is basically studies and not implementation. Implementation is done by others. Many projects are implemented in Vietnam, Sri Lanka, Maldives, and Kathmandu, Bangladesh etc. These reports were referred to arrive at the implementation management. Some consultant companies involved in these projects are also consulted though they are not involved in implementation management.

From the past studies, from Central American Caribbean region, Panama, Philippines, Thailand (14 Southeast Asian countries) and Sri Lanka. Why implementation should be one of the subjects of importance? This question arises when we try to implement projects that aim to benefit people. It is important that such projects follow participatory approach in areas of implementation and operation maintenance. Good operation maintenance is a key element in the entire project cycle.

Community operated flood warning system in Central America and Caribbean is one of the interesting case studies to learn from. Community based flood warning system was established in 2001. The operation of warning system is done by communities including

women. The mechanism works like this. When rainfall reaches some level, then the automatic gadget would sense it and communicate it to the telephones of the people living in flood prone areas. The sensor has graded system equal to the levels of the flood. Hence, the sensor would sense appropriate levels of rainfall and communicate the corresponding levels flood warning to the people. The advantage is, in catchment area if rainfall happens in a night which can cause flood, it can inform the people immediately. Also similar systems apply to water level measurement. In many instances, the monitoring of water level is monitored by human attendant by going to the river physically which is yet times dangerous to do during peak rain events. The rainfall measurement systems can also be established in the house. The person who takes measurements lives near to the river and his is the most vulnerable. However, rain happens in the up-streams and water comes to down streams. If measurement site is upstream and the measuring person lives in up streams may not be alert, as he is not affected. Hence, the measurement person was chosen who lives in down streams. However, in Caribbean study location, the person who takes the measurements lives in up streams and her motivation levels are very high and certainly an exception. People in downstream areas, government and the persons take measurements and all work together. The World Bank constructed the dyke to prevent the floods. After establishing the dyke, people started living near to the dyke though they are vulnerable to flash floods out of breaching of the dyke.

It is always difficult to approach communities for their active participation. Communities should be provided with suitable equipments which are cheaper and be easily operated by communities in order that they participate more actively. There is a gradual change in the thinking of professors and other technology developers to go for simple but effective technologies. For example, promoting earthquake resistant housing is one such aspect in addition to the flood example given above.

Panama community disaster management is one such thing. In 2005 flood hazard map was prepared by the communities. They identified 5 vulnerable areas. These maps show the inundation areas and are useful as in its preparation people could come together and talk about the problem. When asked why Panama is advanced in promoting disaster prevention, the Mayor of Panama proved to be very effective leader. Hence, it is important that the political leader is dynamic and promote the disaster prevention initiatives. Even the Mayor would attend activities such as preparation of hazard maps.

The tsunami that affected areas in Sri Lanka was surveyed for various interventions taken up. Vocational training for reconstruction of infrastructure is an important aspect

of disaster risk planning. Many projects of JICA not only are focused on infrastructure but also those activities useful to people in other ways. The vocational training is one such aspect. It was observed that such training interventions could help raise the income of the people. Varieties of projects were been included in rehabilitation projects in Sri Lanka and especially the conflict affected areas. Organization of CBOs could solve the problem of conflict from affecting the project implementation. In the situation of conflicts, one should make use of various religious and ethnic groups for their consensus.

In greater Colombo flood control and environmental management program, the communities were involved at various stages. Some of the important lessons learned here were: involvement of Community development councils in the process proved to be effective. Monthly monitoring and evaluation is important. A separate team should be working for monitoring and evaluation. It was observed that the complex government procedures could mar the project. Advance consideration of these limitations helps a lot.

Discussion:

Q. Downstream people are more vulnerable and keen. However, the upper catchment person should be used for monitoring the hazed. Why?

- People in downstream are more sensitive than upstream people. However, the person from upstream area is safer to monitor it and is close to the situation of rainfall.

Q. I agree with vocational training cannot always lead to earning. Monitoring should always be a part of the training programs as this monitoring could tell that the programs may not lead to more income. It is crucial aspect to be mainstreamed in our programs. In Columbia, the trainings could not lead to jobs as the economy was in depression. So, the training here couldn't lead to benefit.

- More than 60% of world population lives in adobe houses which are highly vulnerable to earthquakes. The Pakistan project would now start with housing technologies that are cheaper and resistant to EQ. The technology developed at Tokyo University could even help in reinforcing the existing houses. Reality in developing countries is that houses are built by household themselves and they don't have money to hire a mason. Hence, we need to evolve technologies that are easily used by these people that are low cost and are easy to adapt.

Q. Does flexibility in implementation needs to be in time scales as usually the projects have strict time scales?

- Yes, I think we need to do that as well though it may not be buy by the agencies.

Q. Usually in Malaysia, the central agency implements the DM projects. Though many actors are included, the political system has highest say (it is a comment so no answer)

Q. Donors fund and implementing agencies implement them. The implementing agencies call for tenders usually from international contractors. The international contractors select sub contractors and then the sub contractors etc. These sub contractors never use skilled labor but exploit the non-skilled ones. Use cheaper material and no professionals are used. The implementation agencies should consider vocational training and they should be given more emphasis.

Q. It is interesting to see how rain gauge has been used for monitoring it. When the rain gauge is monitored does the time factor has been taken into consideration? Another question is how local warning is related to government warning? Whether these two always synchronize?

- The travel time may be not more than 1-2 hours. Usually these sensors work with the time and intensity of rainfall received. If we depend only on the government information, the time may be lost. So, there are first information is sent and then the later the official information would come.

Q. What problems you faced in Indonesia at community levels?

- The problem in community there has been lack of awareness of DM and about the future risks due to EQ. As the psycho of EQ in Indonesia is like 60 year or so, the communities think the next EQ may not come immediate. SO they construct same kinds of houses and risk reduction is given least importance. This has to be changed. EQ resistant constructions such as housing and schools should be introduced.

Comment: Taking the comment of psycho of EQ in Indonesia, it is unfortunate that we always respond to EQs rather than taking it as a ever living awareness. The key issue is planning is important. But implementation should have to be imagined and planned in total. Immediately after disaster, what is needed is strong governance that is flexible enough but should have clear roadmap. Monitoring and evaluation is another important point. Monitoring and evaluation is done usually done in response to the donor's requirements. However, the monitoring and evaluation is done through community based schemes, they can lead to longer memory owned by the local communities.

Case Study presentation

Case study of Kitakyushu

- Implementation is important even when planning and other regulations are available.
- It is considered that the Japan's process in decision making is different from others.
- The location of the Kitakyushu city is in the south of the Japan and northern part of Kyushu islands with earthquakes and heavy rains as natural hazards. The city has a character of industrialization. Before 1901, there was a small village with few thousands of people. But later, national government established a first steel mill in the history of Japan.
- Lot of pollutants are released into the bay as a result of industrial growth.
- The direct discharge of pollutants into the bay made the water highly acidic.
- The slums have developed rapidly around the city.
- To resolve the industrial pollution, many implementation schemes were implemented.
- There are 3 factors for the success are: Citizen's movement, and awareness generation and local initiatives in the city to control pollution.
- The mass media could play major role to reduce anthropogenic pollution.
- The elected mayor has the twin and conflicting responsibility of developing the city's economy while keeping the health of environment and residents in the city.
- In 70s the pollution diet was opened at national government and around 14 rules and regulations were enacted.
- The implementation was smoothly organized and it can be considered as one of the successes of Japan. The both vertical and horizontal aspects of policy implementation were considered.

- The government supported the citizen's movement for pollution control.
- While the men were working in major factories such as Nippon etc, the women were organizing movements against the pollution problems.
- A movie with title 'we want blue sky' was made to raise awareness among the communities and other polluters.
- One of the cases of effective decentralization in Japan is reflected through formation of authority for issuing smog alert. Strick rules were imposed on the industries. The smog alarm was issued for the first time in 1969. At the beginning, the prefectural governor had the authority of issuance of smog alarm. Eventually the authority was transferred from prefectural government to the local government.
- The multi stakeholder engagement was another success.
- Risk management policy was prepared.
- As a result of many initiatives listed above, one could see marked improvement in the pollution condition in the city.
- The major factors in success here are: Timely intervention of the government intervention, corporate social responsibility, and multi-stakeholder involvement.

Discussion:

Q. What criteria was used for monitoring the air quality?

  - The multi-point criteria was used to monitor the air and water qualities targets were set. The non-economic approach was used.

Q. 43% was spent on sewerage in Kitakyushu. How did you manage the sewage problem?

  - The sewerage treatment plants were established and subsidy was issued to by the central government. The first sewerage plant was started in 1970.

<u>Case study of Bangladesh</u>

- Dhaka city is defined into 5 areas: Dhaka city corporation, Dhaka metropolitan area and Dhaka statistical metropolitan area, and Dhaka metropolitan development plan. The Dhaka mega city area witnessed tremendous population explosion during recent times. The top three risks in Dhaka city are air pollution, surface water pollution, and groundwater depletion. Solid waste management, sewage management and noise are considered next.

- Air pollution, as monitored by Suspended Particulate Matter, through a program of Ministry of Environment, recorded SPM levels beyond the prescribed levels. The situation is much worse in slums of Dhaka. Response to air pollution includes introduction of CNG gas and banning two wheeler vehicles running on petrol.
- Surface water contamination in four rivers surrounding Dhaka is very high. All the rivers recorded heavy to very heavy contamination of heavy metals. Even presence of various laws such as national water management plan, urban water body protection law didn't help due to lack of strick enforcement.
- Groundwater depletion was mainly due to heavy consumption and nearly more than 80% of water needs in the city are met from the ground water alone. Only 50% of solid waste disposal is done by the city corporation. The solid waste remaining uncollected is leading to pollution of surface water bodies and spread of diseases in the city. As a response, the DCC has established a pilot project in Rampura Ward No 22 though stakeholder participation.
- Polythene bags were banned to reduce solid wastes and blocking of sewerage. NGOs were involved to collect and compost in the Dhaka city. The NGOs have established 4 composting plants. Solid waste generation and disposal plants were studied by JAICA and developed a master plan for Dhaka. Various factors such as cost benefits were considered.
- Sewage management/system is accessible only to 30% of the city population. A couple of studies by The World Bank and JAICA were taken up. Noise pollution is mostly due to vehicular horns and movements, industrial operations, and construction and repairing works. The response to reduce noise pollution includes formulation of rules which are pending to be authorised by the Prime Minister.
- Land use problems are due to unequal distribution of landholdings. About 70% of the city residents live in only 20% of the land area. Transport congestion is one of the severe problems and the situation becomes worse during religious processions. Dhaka Transport Coordination Board was formed recently and prepared a plan to solve the traffic problems. Nearly 3000 slums and squatters were identified. The problem is being solved through establishment of toilets, biogas plants and water

supply systems.

- Floods are the severe most natural hazard in Dhaka. The flood forecasting and warning center was established in addition to the active role played by the national and international NGOs. Committees were established at national, district, upzilla, union and community levels. The CDMPs were prepared and implemented at all the locations. The lesson is that the strict enforcement could solve the problems such as air pollution.
- Solid waste management is one of the largest programs of UNDP through Ministry of Forests and Environment. This program covers Dhaka and other urban areas in Bangladesh. The program envisages collecting waste, compost it and supply the compost to the NGOs network that would further use it for growing nurseries.
- The public and private partnership is one of the important contributors to the success in solving some of the problems. The program of Beautification of Dhaka City envisages partnership of private and public organizations.

Discussion:

Q. Is it a good idea to ban non-motorized vehicles?

- It was done to avoid the traffic congestion in the city.
- London banned the two-wheeler traffic and now London traffic is very quick.

Q. Traffic is a big problem in Dhaka. It is because of the city size and volume including the density of the population?

- The population is huge. The number of non-motor vehicles is also huge and they can occupy nearly 70% of the Dhaka roads.

Q. One of problems of Dhaka is huge service area in the middle of the city. This is creating lot of congestion. How can it be solved?

- The plan is to move some of the government and private offices outside Dhaka.
- Bangkok is one of the famous cities for air pollution. The metropolitan office is working on reducing the air pollution including improving the public transportation. Though these options are costly, the Bangkok tends to work on public transportation first and then several World Bank projects try to introduce substitute fuels as well. The other option available is identification of restricted areas. Noise pollution is being reduced through King's initiative off late.

C. The Dhaka government has been working on SPT that includes subway as well.

Group Discussion

Second group discussion was simulation activity. Following scenario was given to each group and was assigned to assess situations and come up and accordingly take decisions and implement action associated with their specific respective stakeholder roles.

Scenario: It has been raining for the past one week in your city and the surrounding region. This rain is unusal for this time of the year, and there is a fear of floods.

Plenary session

a) Government:

The rescue team was prepared first with police, army and others. We strengthened the communication with the hydro-met department to get the information. We had a communication strategy with media for effective information sharing. The NGO and Govt shared information to fill the gap including materials. The community and NGO were also involved.

The evacuation center was established once the dyke broke information received and evacuation plan was implemented. The medical, food and other supplies were dispatched, police informed through megaphones for keeping calm conditions. The impact was assessed and checked if other areas would be vulnerable in future. The police was mobilized to avoid criminal action and civil unrest. Mobilized equipment for rescue and evacuation works. Volunteers were despatched.

The emergency situation got receded. The temporary shelters were setup first. The meeting was called to assist in developing plans for future. The dead bodies were disposed off after the identification. The garbage was cleaned and dumped and appropriate measures were taken to avoid epidemics. Human resources were arranged. Estimation of damage was done including compensation who lost every thing. The communities were involved to organize local cleanliness. Fund raising was also carried out for NGOs etc. psychosocial care was also

taken care of.

Later, celebrated for the better performance. Set up preparedness center and special fund was established to support a preparedness center. All the bills were settled using the funds raised. The master plan was updated at a special meeting. Capacity building programs were organized for communities and government officials. Assessment was carried out on what should be done in future. A feasibility study was taken up for future good dyke management.

Discussion:

C. Govt cannot easily drive government but requires lot of multi-stakeholder operations.

C. It looks like you assumed there is no disaster management plan. IN the first 7 days of flood, there is no existing DM plan. So, preparation of DM plan has been included in the post-disaster stage. Each stage has been assessing the performance at each stage.

Q. You had a DM plan as a community and you thought of joining the govt in implementing the DM plan. If so, how was the development of this DM plan in the new role of govt. Did you refer to any discussion you did two days earlier or you considered it as a new assignment.

A. There is no conflict with our past plan. You can see that the response was well organized and idea was there.

Q. Can you explain the community notice board/volunteer dispatch board?

A. The idea is that there is one place. As soon disaster happen the volunteers will come and expect some information to be passed on. There will be central information board in front of which the volunteers will pass on and come to know about the information depicting the needs. This is supplementary to notices to rescue groups. The rescue groups will be told to tell them about the collapsed buildings and they immediately rush to the place. The volunteer team notice board is complementary to the rescue teams.

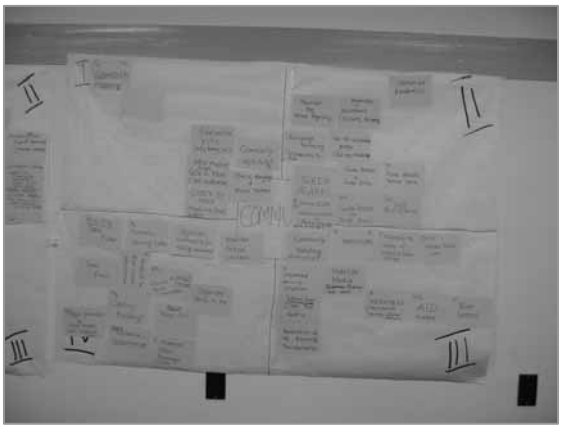
Q. How are the volunteers managed in Japan?

A. in 2004 there was big typhoon and a Volunteer center was established the next day. The social welfare association (not a govt, but a semi-govt organization) has set up the volunteer center. The management is done by local govt with social welfare department. First, they identified what kind of people would be necessary to manage the situation. Later, it was found that even a survey/research did not find the voices so they could not send the volunteers to the situation. One important things was the people who raise the voice could get the volunteers but not others. So it is important that all people should get the volunteers.

Q. There is a private sector involved in the plan?

A. Yes, evacuation equipment such as bulldozers were obtained from them.
Q. Why media has to be controlled, they need to be allowed to flow the information in the stakeholder meeting. Groups such as rotary etc can also be part of the DM plan as they have the philanthropic view.
A. The private sector was also involved in the feasibility studies.
Setting of evacuation centers is also a pre-disaster phase and they may be alerted during the disaster. Every response would enhance the response mechanism.

b) Community:



The DM plans have to be prepared before disaster happen. The govt has to be informed to give information on disaster. We asked other people to get the environmental conditions in the field. People prepared evacuation and emergency along with emergency supplies. It is also imp to ask govt and NGO to prepare vulnerability mapping.

During the disaster, the community announced repeatedly about the disaster and asked govt to do repeatedly. Community alarm was rung and asked people to monitor the rain gauge and find other place on the map for a safe place for evacuation. All people were evacuated. After that, volunteer groups were prepared and dispatched. The communities asked govt to bring people to safe places. The govt was requested to rehabilitate the government.

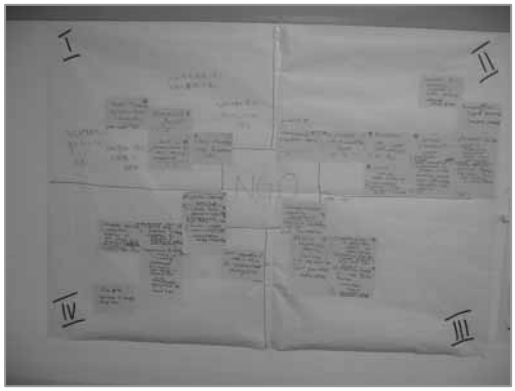
One week after disaster, what community do was to walk around the community to do a watch and understand the situation themselves. The media was mobilized to give information on situation in evacuation centers and situation about water such as boiling for drinking water etc. Others long-term operations are cleaning of debris and houses with the volunteers. Some things asked to govt and ngo are for increasing security, sanitation, mental health care programs to people. The school childrvt for better conditions. Building up the memorial to not to forget the disaster memories was also included. en and DM committees were mobilized. The DM committees include teachers so that the education program could be developed and implemented in the schools. The communities when organized they can build their own capacities, or negotiate with goPlanting of trees was also included.

Q. Decision to ask for psychosocial help from govt may be OK. What if communities

themselves can cope with this? Putting memorial is one of the nice things.

A. These kinds of programs may better be implemented from schools or NGOs. Outside help is necessary for this kind of help. So cooperation of others is important in this area.

c) NGOs:



The first thing that the NGO should do during pre disaster is to get the disaster risk map or flood risk map. This map is usually developed by the govt or other central agency. Then, the NGO keep monitoring the disaster situation in cooperation with community and government. Monitoring of the situation for internal planning purposes is also important while assist in assessment of the early warning with government and communities. NGO also have to prepare for the emergency operation centers for receiving the evacuees.

During the disaster, evaluation of emergency response and action planning should be done and communicate community and government regarding evacuation order. While rapid emergency / flood impact assessment should be done for enabling future actions by the NGO, we also have to prepare and deploy evacuation teams in coordination with community and local government. Evacuation to safer place, search and rescue, as well as various service provisions at evacuation center should be done in close coordination with community and government.

After one week from disaster, there are not so many things to done alone by NGOs. Damage assessment, needs assessment, debris clearance, food assistance, rehabilitation should be done with close coordination with community and government.

As for long-term operation, NGOs should raise funds for better preparedness in future. In collaboration with community and government, NGOs can conduct training workshop, update the risk scenario, review and update DM plan, recommend to improve early warning system, assist effective relocation of slums, integrate NGOs program to government program. We can also develop the concept of eco-city with the help of Japan.

Day 6 (28 July) – Module 5 and 6, Group Discussion

In the morning, Module 5 and 6 lectures were provided by Dr. Rajib Shaw, Kyoto University and Mr. Manu Gupta, SEEDS respectively. Details of their lectures were as follows;

Module 5: Education for Sustainable Development by Dr. Rajib Shaw

- Started with introduction of the concept referring to World Development Report to have clarity on what is to be sustained (life support systems, natural environment, communities) as well as what is to be developed (economies, society, people) in what relation, for how long and at what scale.
- Different types of capitals (social, human, physical, financial and natural capital). It depends on which capital needs emphasis in education based on the local context.
- World summit for sustainable development 2002 at Johannesburg (WSSD-II). First WSSD was held in Rio.
- Education is not one time but lifelong learning process, hence should be continued beyond classroom / school with individual and cooperative education.
- This is decade of education for sustainable development (DESD) from 2005 – 2014. UNESCO is the coordinating body for this decade. This provides good political framework and policy environment to act together for education towards sustainable development.
- DESD domains: contains basic education, reorienting existing education at all levels to address sustainable development. Developing public awareness and understanding , focusing on advocacy, communication, networking, etc.
- Essence of education “tell me – I will forget, show me – I may remember, involve me – I will understand”.
- Disaster education survey covering 1000 school children in Japan about their risk perception. In Japan, Kobe earthquake (6400 people died inspite high technological knowledge – most of the houses were individual houses and were not the high rise buildings) as prior to it, disasters management was very much engineering oriented but after Kobe earthquake is more socio-engineering aspects oriented.

- Developing the culture of disaster preparedness requires time. Once this culture is developed, a person will practice it irrespective of wherever and whatever position the person is in).
- This study was conducted in many cities of which Hyogo experienced losses from Kobe earthquake, Osaka felt earthquake without damage, Aichi, Wakayama, and Shizuoka are placed in high disaster risk areas. Hence the target group is varying from low to high experience of disasters, as well as high to low disaster education. Miko High School is running 3 years intensive course in environment and disaster management.
- This model is developed from two sources. One group of students learn about disasters from earthquake experiences and another experienced this through disaster education (community, family, self).
- Tools of education: school education is generally one way but community, neighborhood or self education is a two way process.
- Integrated model : from knowing (knowledge) to realizing (perception – student with earthquake experience or damage to earthquake have higher perception), deepening (want to deepen or actually deepen), decision (wish to prepare or actually prepare), implementation (dissemination).
- Deepening : those who wish to deepen have high expectation from internet, family, volunteers, teachers (although less interested in lectures) and friends. Although 80% student wish to have information from the internet , only 30% get it from internet. 20% students attends lecturers to deepen their knowledge. Family education is big and accessible source of education.
- Preparedness: although 80-90% students wish to prepare for disasters, only 20-30% actually do it. Experience is important but its not the only contributing factor school education is important for perception making, but for actual education, family and neighborhood education is most important. Enhancing action by listening, watching, doing and talking.
- Environmental education: knowledge, skills, values, experience, determination. It exist from time immemorial but not formally. May be in practice, part of life as living with environment. It begins at home with tolerance and open mindedness.
- Kids ISO 14000 is a proactive learning programme systems which is promoted by Artech (an NGO), UNU, UNEP, UNESCO and international organization such as

ISO to stimulate. What activity students do (for 2 weeks) and its impact on environment followed by improvement in practices to improve (for 2 weeks) and its impact on environment. It start by giving stamps, primary level certificate and CO2 certificate. This affects through PDCA cycle in their daily life at household or family level.

- There are different models of education. First is Maiko high school curriculum supported by local government, which is a cycle of life-long education , problem solving study etc. Second model is NGO promoted process (eg work done by LEAF in Nishinomiya). Third model is kids ISO programme, which is a NGO prompted programme. Fourth model is local government promoted model like Saijo city. Fifth is spontaneous community education (like Shirakawa go where 2000 years old buildings exixt and community members still helps to build thatch roof.
- Way ahead towards this lies in holistic approach, process oriented, partnership based, expanded urban management.

Discussions:

Q. An educational survey in UK revealed that from a lecture, after one week only 2% knowledge is retained by the students and after 1 month it reduced to 0.2 % only. Hence tutorial is important. Converting passive to active learning requires listening but experiencing as well.

Q. How much to add in school bags as bag is getting heavier over time.

- In Nepal, government schools are overloaded and cannot introduce any new subject. In private schools, there is a pressure of good performance. Research is on to analyse as how disaster management is incorporated in history, social science, etc subjects. Teachers are important change agent. Bangladesh has sustainable environment education programme at district level in which government provide training to primary and high-school teachers. Now teachers are adding this learning to existing school books etc.

Q. Education (investing for future generation) versus physical act (like constructing a dyke for 30 years). Unfortunately, education get low priority with government, how to change this mindset?

- DESD is a good intervention to create political and policy environment. For example IDNDR got disaster management into government priority. MDGs and DESD both has education for all as priority for policy environment. At local levels, different models as discussed can be tested. Advice is to do so good work that

government can not avoid to ignore it.

Q. In Thailand, 8 subjects already exist for basic education and they don't want 9th as disaster management hence adding this to existing books in different subjects.

Q. Politicians and administrators (in Philippines) ask for the results hence injecting disaster education into other intersections (piggy banking of disaster education).

Q. Advertisement is a good and not much explored yet. Although it has same objective, as they targets much more that knowledge eg. Values, social representation etc. Generally we focus on contents but advertising need it to focus on giving right message to people.

Q. Galle mayor has lifetime learning from Tsunami. Angola and Ethiopia are learning from each-other experiences. Similarly visit of Nepali masons to India is the learning of optimum learning experience through exchange.

- For Tsunami, working with SEEDS and two other NGOs in Sri Lanka and Indonesia and utilizing cross visits to see mutual learning, video conference and visit etc. ADRRN, SEEDS, KU, Sarvodaya, etc are exploring this at various levels.

Module 6: Information and Communication Management by Mr. Manu Gupta

This presentation is my experiences and observations related to information and communication management in DRM. Tsunami stimulation of Java island last week is one of the example of information and communication.

The concept of disaster risk management

Disaster risk management is about taking right decisions, by the right people at the right time. To make this happen we need to base it on a sound information and communication system. There are four main components in DM cycle. Non-disaster: the activities that include disaster mitigation leading to prevention and risk reduction. Before disaster: activities that include preparedness to face likely disasters, dissemination of early warnings. During disaster: activities that include quick response, provision of relief, mobilization, and rescues

damage assessment After disaster: activities that include the recovery and rehabilitation program in disaster affected areas.

Each stage of DM there are different information and communication management. In non disaster stage, risk assessment for implementing mitigation action has been carried out. During this phase, advocacy, awareness and training are implemented. Before disaster, information is gathered on likely disaster and communicating the same to the people, particularly to the last, most vulnerable people. During the disaster: Situation assessment appropriate response action. This phase needs dynamic and resilient communications for prompt actions. And after disaster: information for coordination and meeting community needs, communicating for humanitarian assistance to ensure coverage. It is important to notice that the information and communication system need to adapt or reliable to traditional system.

Urban areas: City has several historical layers. It has complex ethnic, religious, cultural and economic structures. Cities are often governed by multiple agencies. There are two important aspects of cities: population and density. City physical structures make them at highest risk to natural disasters. Cities also have advanced emergency management systems, knowledge, technology and the people to response to emergency.

The case of Delhi

It comprises 7 cities with the population of 14 millions. The density is 9294 persons/sqkm, but only 33% population in planned colonies. The communications of each community are also different. Original inhabitant: communication is internalized, mostly informal. Immigrants: still relate to there places of origin, very little communication with others. Floating communities: no sense of belonging no communication.

Because lack of information, people don’t know what to do, they depend on government, therefore loss, damage and number people killed by disaster increasing. The main problem is that knowledge is not communicated and citizen remains dis-empowered while emergency system, legal systems rules are set.

Way to go:

Establish a participatory information system for intelligence and dissemination. Layering citizens’ information with scientific information. Applying a communication structure and simulating exercises are important.

Some good practices:

Participatory mapping is carried out by citizens making vulnerabilities in their neighborhood e.i. Faridabad India. Town watching: citizens walk around the town observing vulnerabilities, followed by preparation of o management of a management plan.

Bridge: Gujarat: forming a bridge between government, community and CSOs during rehabilitation.

Lessons for good information and communication management system: Use of appropriate tools for involving community at risk. Dynamic and resilient linkages both bottom up and top down. Be open and transparent. Based on mutual respect.

We need to understand the formal and informal communication channels among citizens. Past event should provide information for planning for risk management. Multi-layered information system that is human and it incorporates the chaos of multi polar democratic society. Information and communication should be shared as per acceptable principles and norms in given cultural context.

Discussion:

Q.: After the earthquake on 27 May in Yorjakata, there are too many sources of information that make people more panic, people get confused. The gov in this case have difficulties to announce the information. How can you deal with this situation?

- We need to develop the simulation drills of volcanic, earthquake and need to practice regularly. When we are preparing for the drill we can deal with the real situation better. Normally the leadership plays a very important role in disseminating information to the people, because people rely on them

Q.: How to deal with the arrogant problem as many plan developed by outsider with out any consult with local people.

- Repeatedly leaning each other, flexibilities to set up the relationship with people are very important in communications for DM.

Q.: Where does the fund come from for SETU activities?

- This is an NGO initiative and of course Gov contribute sometimes. This is a win-win situation.

Case Study presentation

Case study from Saijo

- The Saijo city is located in the southern part of the Japan. It has a population of 1,16,000 with an area of about 509 km^2. In 2004, 6 typhoons hit the city simultaneously leading to severe damage and landslides caused by the heavy rainfall. The damage by typhoon 21 included damage to the road that leads to the city and damage to the houses around the mountain area. An area of 150 sq km was heavily damaged.
- The drift wood from the up-stream mountain areas has severely blocked the roads and blocked the river flow. The landslides were believed to have caused this heavy upheaval of the trees which are flown down by the running water. Kawasaki Bridge was washed away by the typhoon floods.
- There is an active fault around the Saijo city which is contributing to the hazard risk. Due to this, there is a danger of inland earthquake in the region. The simulations carried out suggested a huge damage due to Kawakami/Komatsu dislocation. In majority of the locations, the damage expectations were exaggerated due to the southeast sea or south sea earthquake. The earthquake probability in the region is expected to be around a magnitude of 6 with tsunami threat.
- It was important to institute appropriate instructions to promote voluntary disaster prevention activities by the local inhabitants. A decision was taken to bring out voluntary disaster prevention organization. Saijo city was formed with union of 4 cities on 2001/11/1.
- The city now has a disaster management plan and a set of guidelines to rent out disaster prevention goods to the communities. The disaster prevention tools costs around 3000 USD. The guidelines also include an organization chart and local disaster management plan.
- The city organized seminars in 27 public halls of the city. Nearly 30% of the city is

covered by the voluntary organization of disaster prevention.

- Eventually, through constant education and training, the local communities became the key persons for organization of community based disaster management in the city.
- The Saijo city is now working with the Kyoto University to raise the awareness of the citizens and the staff of the city government.
- The city also envisages enhancing the disaster management capacity of the city government. The city has been making evacuation map with the citizens.
- The city also has plans to plant trees to protect the mountain slopes from landslides.
- The evacuation houses were spotted on the evacuation map along with the identification of vulnerable houses and marked places where government declared as hazard prone areas.
- Some of the evacuation houses are located in the flooded areas and the communities cannot use them in the event of a flood. The municipality plans to identify alternative evacuation houses.
- The historical knowledge from the elders was also included in the mapping exercise.
- Based on the mapping exercise, the city is implementing awareness generation programs for the communities.
- The other activities of the city include establishment of satellite-based mobile communication facilities, dissemination of simplified disaster prevention maps, and conducting training programs on disaster management.

Discussion:

Q. what was the system before typhoon has struck the city?

- Many of the guidelines were started in 2004. However, the voluntary groups were there since earlier times though they were not much active. After the disaster in 2004, the disaster management planning became a priority to the government.

Q: In the last couple of years the Saijo city has started innovative approach due to the strong leadership. What message would you like to take back to home?

- The most important thing that will be taken back to home is the information provided in the entire process. There are ideas to replicate in consultation with

the citizens. Nishinomiya is doing a good work and Saijo city has plans for long-term education program where the experiences from Nishinomiya can be considered. The voluntary disaster management group can also be part of some of these activities.

Case study of Thailand

- A project funded by Japan Funds and Trusts through UNSECO, Bangkok as a part of development of education materials for natural disaster preparedness in the context of education for sustainable development was participated by many countries from Asia. The issue under consideration here is development of video education material and lessons learned out of the exercise.
- The stakeholder consultations were carried out first. The activities going on in the region were considered in the workshop. More than 20 participants discussed out the rational and strategy of promoting disaster education in Thailand and concluded that the education should cover more than just tsunami. So landslides were also included.
- Video was selected as an effective communication medium for communicating landslide awareness messages to the local people.
- The target area of the intervention is in the northern region of Thailand called Chiang Mai. A series of discussions and consultation with local authorities at the district and sub-district levels, as well as with a concerned national agency –Department of Mineral Resources – was initiated in February 2006 as this department is responsible for landslides and other geological hazards.
- The consultations included head of the community as well. The script was drafted with information on landslide situation in the region, local knowledge is throughly included, and concepts and terminology were clarified. The script was developed in three languages of Central Thai, English and a local dialect.
- Dos and don'ts formed the key messages in the video. A small booklet was also

prepared to accompany the video.

- The lessons out of this exercise is there is a need for good preparation, proper planning of target audience, scripting process, and proper selection of production members. Selection of appropriate language is an important aspect that determines the ultimate success of the video.
- The exercise also brought out some recommendations related to selection of means of reaching people, selection of target audience, involvement of the local communities, continuous updating of the video etc.

Discussion:

Q. Is video a good medium for reaching to women, children and elderly?

- Yes, the video is good for all. In addition, the video should have short key messages to suit to the busy people.

Q. What other media are good in addition to the video?

- Script is another thing that adds value to the video. Posters also attract the attention and lead to good awareness generation. However, these are very static and are always after the video.

C. Dramas are important methods of communication in Bangladesh. Dramas attract the people as they are very much linked to their lives both culturally and socially.

C. The video should be continuously updated and made interesting. Cartoons are very much liked by children.

Group discussion

The themes of the last group discussion were role of a) education, b) information management, and c) communication for disaster reduction. Discussion leaders of each group appointed one or two persons within the group to represent government, NGOs, community, academia, and private sector and discussed the assigned theme taking into consideration the previous two group discussion and city's future strategy and planning.

Plenary session

a) Information management group

Information is available but how to access them is a major problem. Information management plan should cover pre, during and post disaster stages. Resource mapping, damage needs assessment, capacity assessment, hazard mapping etc should be considered in any information management model. The pre and post disaster risk assessments should be coupled.

Information management is disaster management. Often, the pre disaster risk assessment and post disaster damage assessments are not linked. The post disaster damages give the real vulnerability while the pre-disaster is the one which is projected vulnerability.

There are important questions like who has information, where it is stored, and how it is accessed. Once these questions are answered, the problem of disaster management is solved.

The rankings of the major issues in disaster information management are:

1. Vulnerability maps
2. Collection of appropriate information
3. Media management after disasters
4. Local capacity assessment, available skills, and
5. Availability of evacuation centers

C. Do we need tight security for the disaster information? As disaster information deals with the public good, it may not be appropriate to keep it in safe lock and key.

A. Business continuity plans are important business strategy for private companies and

they may not be revealed to the competitors. However, the transparency should be the general policy. The Silveso directive indicated to mark all potentially vulnerable locations and onsite safety plans should be identified. Though the idea was mooted to keep the risk information secret, it was ultimately made open so that all the people know about their vulnerabilities. The disaster risk information, plans and other material, should be kept safe but not secret. The redundancy and resilience should be built into the system so that the system is not taken by surprise with a complete loss of valuable information.

C. The Indian government has recently mooted the right to information act. It envisages revealing of all official information except that information which doesn't fall under the Official Secrecy Act. This is observed to be one of the major decisions by the Indian government and one could expect greater impacts in terms of governance.

C. Disaster management plan is viewed as part of the information management plan. However, it is important to provide important contact details in the information plan as well.

C. Many plans don't talk about long term actions. It may be better to workout plans that are adequately linked at different levels such as across district, state and central levels. One example for lack of linkages across the levels is Katrina where the plans.

b) Education for sustainable development

The media group was added to the suggested groups of government, community and NGOs.

The prioritized issues are given below:

1. Longterm education plan
2. Research on disaster risk management and publication of all research findings such that all have equal access to the information.
3. Support to the disaster management issues in the Parliament on legislation and budget.

Q. Education may be grouped into formal and informal ones.

A. Yes, such a distinction was made. For example, indigenous knowledge could be considered as information education.

Q. What are the short-term and long-term steps for education for sustainable development?

A. Long term ones includes development of education policy such as ‘Education 2026’.

C. Most of our learnings came from bad planning of cities and rural areas. Hence, a focused intervention on city planning may be included.

Q. Did the continued education received focus in the discussion? It is happening in many countries called CPT (Continued Professional Training).

A. Architects and urban planners initiative was organized by UNEP. This includes professionals in Asia Pacific institutions including schools of urban planning, the national organizations that provide certifications for urban planning, associations of schools o planning etc. They were given awareness raising seminars. The same may be transferred to the disaster risk education.

C. Nepal does have a division that focuses on continued education.

c) Communication

The prioritized issues are:

1. Advocacy: how to communicate with volunteers, develop CBDP, conduct study tours etc.
2. Coordination: monitoring, supervision, financial resources, evacuation simulations etc.
3. Publicity: Community livlihood system, communication tours, verifiable information sources, avoiding missing information.

It was difficult to differentiate among many issues and there were many overlaps among some of the issues such as prioritization and coordination; hierarchy and coordination etc.

Q. How should one start with the preparation of information management plan?

A. Prioritization, coordination, hierarchy etc were brought out so that one can

understand the community layouts, the risks, their attitudes and perceptions for designing an effective strategy.

Q. In communication strategy, how the various steps such as coordination, advocacy, and publicity are carried out?

A. Communication should not be considered in isolation. Hence, capacity building for communication, development of communication systems, identification of communication media etc were included in the model.

Q. Should communication be two-way?

A. Absolutely. The system should not be both top down and bottom up. One has to understand communities and help them communicate back to the government.

C. 3 key words of communication are: Coordination, coordination and coordination.

Q. Everybody believes in coordination but nobody wants to be coordinated. There are different levels of coercion in the process. Often, for e.g. in Indonesia the NGOs wanted to work at those places where they could have good access to communication and other facilities. Govt had a difficulty to send NGOs to isolated locations. It calls for attitudinal changes for better coordination.

A. There are different kinds of coordination: financial coordination, institutional and operational/programmatic coordination, training and capacity building coordination, informational coordination and legal coordination. All these are essential for effective coordination and communication.

C. Some governments often understand the importance of collaboration and coordination. Hence, the legal approach may be used for ensuring all players listening to the government and adhere to the rules of coordination in emergency conditions.

Final Message?

Disaster management is after all a process of information management. An, information dilemma matrix could be thought out. This matrix has four squares: information one have, information one don’t know they have, information that one know they don’t have, and information one don’t know one don’t have. Information has many facets and one has to look into all of them for better information management and sustainable disaster risk planning and risk reduction.

Day 7 (29 July) – Wrap-up and Evaluation, Open Forum

In the morning of the last day of the Workshop, plenary session was held to discuss the follow-up activity from this Workshop. Participants were suggested and agreed to create a mailing list of participants and interested resource persons to further share information on urban risk issues.

After completion of evaluation, the morning session was concluded.

Open Forum
(International Symposium on Risk Education for Sustainable Urban Environment)

International Symposium on Risk Education for Sustainable Urban Environment was started with the welcome remarks by Dr. Toshio Yokoyama, Vice President of Kyoto University, followed by opening remarks by Dr. Hari Srinvias, Chief of Urban Environmental Management Unit in UNEP-IETC.

Two keynote lectures were presented by Dr. Norio Okada and Dr. Masami Kobayashi. Dr. Okada focused on the importance of community initiative on urban risk reduction, drawing the examples of community involvement in Chizu. Dr. Kobayashi on the other hand referred to the urban structure mostly made in wood in Kyoto back in Edo-period and how people tried to manage their risk back then and how we can learn from the past for urban risk and urban environmental issues of today.

After a short beak, a panel discussion was conducted. The details of the presentation and discussion were as follows;

Panel discussion: Toward Sustainable Urban Environment

Rajib Shaw:
The essence of sustainable urban environment from the Japanese term "*sumi tsuzuketai"* may not exactly be translated to its meaning. The exact English translation could be "place where we want to live" and this is what is important. Different functionaries at different levels such as mayors, professionals and NGOs need to work with communities to realize the vision of sustainable urban environment.
One visualizes rich buildings and buzzing transport systems when it comes to Urban

environment. However, it is not so. Japan means not only technology but also lot of rich history and knowledge that is preserved in the communities.

The big problems of urban environment can be solved in different ways. The complexity could always be solved by holistic approaches. When a complex problem is solved in holistic way, then the problem becomes simpler and even more solvable. Hence, the community participation makes the problem simpler.

There is rich knowledge existing, however not being practiced due to some reasons. The rich knowledge and experience should reflect into actions. To fill the gap between knowledge and practice, one needs to sensitize and encourage the stakeholders to apply the solutions to practice. This means, the culture of safety, preparedness and environmental management need to be practiced in daily lives.

Prof Kawabai Sensei, from ArTech and a nuclear physicist, has developed some excellent ideas on how to bring out the knowledge to action. Saijo mayor made the city a leading one in Japan in terms of environmental preservation. Mayor of Galle, SLK is one of those strong leaders in SLK who proved the need for environmental preservation. Mr. Manu Gupta from SEEDS, India and Prof Ian Davis from University of Oxford Brookes would be the commentators.

Kotaro Ito:

The Saijo City is modernizing the system of department of safety and security of citizens since 1st April 2006. Because of the typhoon, the safety has become a major pillar in the province. The sea, landmass and mountains etc all makes it very rich landscape and the highest altitude in the area is 2000 m. The efforts are to sustain the richness of this environment.

The community based risk management was started in Sept 05 and some drills were conducted off late. The city has a population of 60,000 and is being called the capital of water. There is big industrial belt around the city.

Saijo city festival, called floats festival, is one of the oldest festivals, where more than 170 floats are dragged in water. Here communication is the main topic. Children and elder get united and communicate. This may be named as float disaster management festival. In mountain areas there is lion dancer festival as well. These two festivals serve as a means of reaching to communities as nearly 160,000 people gather during these festivals.

There were 10 typhoons in the area and 6 of them landed 2 years ago. The death toll in the city was 500. More than 150 km^2 was severely affected. The damages include the vital road that connects the city and rest of the world, uprooting of trees and damage to the homes and bridges.

Another risk to the Saijo city is earthquake. There are tectonic lines and active faults passing through the leading. The simulations indicated severe damage to the infrastructure in the wake of an earthquake.

An aerial survey was conducted after the typhoon. The damage assessment was 170 billion Yen. About 19 billion yen was allocated in the annual budget and debt is to be reduced by 1 billion yen per year. No later the city had large accumulated money which could be used for reconstruction.

The drifting wood was used as souvenirs which also raised lot of money out of it. It also raised awareness and kept the disaster in the memory of the communities. Nearly 32160 pieces of wood were prepared. People can come and collect the pieces and they can use them for what ever purposes they wanted. For example, some one used it for signboard and others used in front of the doors.

Erosion control is one of the imp steps in disaster management. Erosion in the upper parts of the hills led to uprooting of the trees and few landslides. The government never expected such damage due to erosion. The budget provided for erosion control as well.

The community risk management is being advocated in the city. The disaster management map was prepared and distributed to all the households (46000 households) and basic disaster management principles such as don't run and help others etc have been taught.

The disaster management culture has been encouraged to crate a resilient community.

Tsunami is one of the important disasters in the area. The map showing inundation due to tsunami has been prepared and overlaid with the seismic intensities.

A special education for 12-years old, before entering the junior school, has been chosen for imparting education in disaster management. This age group was chosen because the VI^{th} grade is the top grade in the school and the children of this age group serve as leaders in the schools. In terms of physical and psychomotor abilities, the 12y-ear old is strong. These children also have lot of time to spend at home and with the community. They can come with wonderful judgement and can express their feelings. The children were approached with a message saying that 'we depend on you'. The children were told to communicate the information to the community members and at family and be prepared for disasters. This could make them stronger and be prepared in the years to come. Future for them could be brighter.

The meetings were conducted with teachers and children. More than 1000 children underwent experienced teaching. The lion dancer festival was used to raise the awareness of the communities who participated in the festival.
Wooden city initiative is one of the important ones. One need to protect the forests and mountains while constructing the wooden houses. The traffic safety is one of the safety initiatives taken up by the government.

Comment from **Ian Davis**:
The presentation from Mayor Ito echoes the success being achieved in the city of Saijo. Any success in community action depends on the strong leadership. The fact is that the examples are given to communities and encouraged them to take up the challenge. After 9/11, the US leadership made the communities to come out of the problem and have a vision where they are going ahead in the future. The same could be seen in Saijo.
The enterprising ideas such as cutting of the wood into small pieces may be a small act but a powerful reminder to th people and reminds them of the power of the water.
The use of festivals is just another wonderful idea. In festivals, there is tremendous excitement and enthusiasm and it can be streamlined to take positive actions.
National disaster day in China is also extraordinary with lot of street plays and dances being organized with an underlying messages on clean water, good food etc.
The triangle of vitality presented by Prof Okada in the previous session says that if people act responsibly, then that makes them to be better citizens and lead to sustainable environment.
The disaster management education should not be different from sustainable environmental education. The emphasis on 12 year old children is also a great idea. At this age, the children are enthusiastic and don't have cynic view of the world. In many societies of the world, half of population is around 12-18 years old and if an education works for them then it should work for all. It should work in schools, specialized information in curriculum, outside the schools like in England where every child should swim for health and protection purposes.

There are safe schools in Japan but this need to be done all over the

world.

MD Ismail Ariff:

Sri Lanka is a tropical island nation 25 km South East of India. It has a land area of 65000 sq km with a population of 19 million. SLK has remarkable diversity of plant and animal life and has variability in climate which shaped its diversity.

Cyclones, droughts, floods, landslides and earthquakes are important natural hazards. The recent tsunami killed 35,000 or more people. Major floods happen during north east and south west monsoons.

On an average, 2000 people are affected by the floods every year. Nov-Dec is the cyclone season. Landslides and other mass movements are associated with the monsoons and are due to unsustainable land management.

Galle is in the southwest of Sri Lanka. It has an area of 36 sq km area with a coastal belt of 13000m. The numbers of dwelling houses are 21000. On 26th Dec 2004, on the next day of Christmas, the tsunami struck the city at about 9:20 AM. It struck all over the Sri Lanka. However, the most effected were North and East coast. The Southern part of the Sri Lanka i.e. Galle was also affected.

The commercial hub of the city was destroyed and around 2000 people were killed at that place. 2500 people lost their homes and 2000 homes were partly damaged. Most of the government buildings and public places such as markets, bus terminals, and international cricket stadium were destroyed. The destruction was heavy.

The dead bodies were cleared by the municipality, army personnel and the civilians. Many of the dead bodies were deposited in a play ground to be cremated later. The homeless were put in schools and were relocated temporarily in various religious locations. The transportation system, electricity and water supply systems were dysfunctional for many days. The Mayor called the meeting of the authorities and others to clear the roads so that other help can come.

After 2-3 days of the disaster, the NGOs and foreign aid came to the city for relief operations. Army personnel with mobile purification plants to purify the water from a lake. The electricity was restored only after 2-3 weeks through the central government supplied generators to different places such as schools. The municipality established health camps and provided medical supplies round the clock. After a week the foreign

medical team from Singapore, Korea etc started identifying the problems and advised to keep the city out of epidemics. It was a great achievement as there were no epidemics in the city. The tents (from Italy) arrived so that the schools could be emptied after 2-3 weeks. The central government then initiated a disaster management committee and planned the reconstruction and recovery programs to houses and schools and other infrastructure.

The city has started a municipality disaster management unit with NGOs and foreign institutions.

The houses were cleared and the recovery plan was implemented. Later, the local government started the reconstruction and restoration of municipality infrastructure such as roads and clinics. The foreign help played a major role in the disaster recovery and reconstruction. Almost all the developed countries have come forward to help the affected ones.

The Japanese company Kumagai Kumi, who is constructing an express way nearby, cleared the main highway to Colombo using their machinery and within 2 days the roads were cleared and the traffic to the city was restored.

Later, the government has opened a new ministry of disaster management and decentralization was done at the district level. At the municipality level, the school children were taught on disaster preparedness and the school level disaster management committees were formed. The community development officers were advised to go to the schools and make groups of children, teachers and municipal staff to train them on the disaster management.

Comment from **Manu Gupta**:

It is exceptional leadership that made things successful at Galle. Sri Lanka never had any history of tsunami and even after being a fist experience the local government did the best job. Mayors have a twin challenge of working with people and solving their problems and feel the pain out of the difficulties when the same communities are affected by the disasters.

The challenges now are rebuilding the society and creating a resilient community at Galle and make them stronger for the future disasters. It is important to reach all and the last one as well and it calls for a dialogue and continuous communication. No doubt, the schools are the good starting points for creating the culture of prevention and preparedness.

Takaya Kawabe:

The basic approach of ISO 14000 is same as that of the management strategy i.e. plan, do, check, and action. In disaster management, there are 3 responses possible. Response could be by individuals, by the communities, and by national and international institutions and governments. One can say that the result would be successful once all these actions are in place and in harmony with each other.

The child has to learn self management from the beginning and that is how the kids ISO program depends on.

There are two kinds of risks. One is global warming type which is progressing slowly and the other one is like tsunami and earthquake which progress at a rapid pace. For the gradually progressing risks, one may not have past experiences in due to the time scales involved. These risks progress at global scales and hence one need to change the awareness on what is happening and direct the knowledge into practice. There by, slowing down the global warming and reducing the risks.

Pulsated event like earthquake or tsunami, which are local and regional risks, there are past experiences and knowledge. Since the frequency of such hazards is very low, one also need to raise the awareness among communities such that they remain prepared. Raising the awareness is a common strategy in both.

Kids ISO 14000 targets children as they have hopes, confidence in life, capability to overcome environmental issues, and can make their own life. The three element of Kids ISO 14000 are: raising awareness, management and networking. There are limits to what children can do and hence networking is important.

ISO 14000 aims to make children create and manage the 21st century. The cycle of plan-do-check-action tries to instill the management capabilities into the children. For this purpose, 10-year old children are targeted because as the children develop their identity at this age. The famous animation by Hayao Miyazaki also focuses on a 10-year old girl and narrates how the girl becomes self aware and self manage the problems she faces. Lack of self management makes children more dependent and it effects as they grow and become adults.

ISO 14000 is not a single program but a system of programs. During the process, the children move from the primary level to the middle and higher level.

Training courses were introduced for instructors and manuals were prepared. School teachers were trained with guide books, video and other teaching materials.

Above this there is an international committee which issues international certificates. UNEP and ISO supported this effort,. This has synergistic effect with the other environmental education programs as well.

The program is spreading to Europe, US and around the world. Kobe, Habikino of Osaka introduced the program in several primary schools. Around 14-15000 children are involved every year.

Schools, home, family and community can educate the children. Hence, the ISO 14000 involves all the three elements and promotes the education in both directions.

A recent survey showed that nearly 80% of children and 57% of parents could increase their environmental awareness also increased the awareness. As a result, the children could reduce the CO_2 emissions between 10-15% with +ve effect on the environment. A total of 40000 tons of CO_2 emissions could be reduced, an estimate suggests. The CDM of Kyoto Protocol (KP) provides facility for emission trading and this kind of emission reductions could be traded in the KP mechanism. As the children goes up in the levels, they could even obtain certificates that authenticates their environmental awareness.

Another impact has been that the number of children who carry their own bags for shopping rose nearly to 80%. This shows that children are influencing the environmental behaviour of communities both through the education and activities. Started in the year 2000, the program is already part of formal education in the elementary schools. Tokyo Metropolitan Government and various other companies are coming forward support this program forming a three party collaboration.

A similar design has been used in Australia, Paris, UK, Belgium, Korea, Middle East and others. In conclusion, one can say that the Kids ISO 14000 is becoming of the environmental achievement of Japan. It has potential to solve environmental, poverty and disaster management related issues. The children will create and manage the 21st century.

Comment from Ian Davis: The greatest defence against disasters is preparedness. It is said a well prepared community is the greatest insurance to disasters. If this is correct, one should start with the children. The idea of community is that they are the first respondents. Globally, 90% of the rescued are by their neighbors and it happens first and quick. In Banda Ache, the people cope due to the help of local people who live at higher grounds.

The idea of self management becomes very important. In US the grassroots environmental program is pushed by the grassroot organizations which are also pushing the government to take a stance on KP.

One could see that the LEAF, an NGO in Japan started influencing the government. The ideas such as converting the plastic bottles into pellets and cloths brought a remarkable change in the use of plastic.

Environmental movements are growing at a fast pace throughout the world. Important points to be remembered are: 1. Active learning, involving local communities (e.g. Nishinomiya); 2. Be careful about technicality of information being passed on while simplification is being done. 3. Focus on teachers, 4. Integrate into curriculum but also have an isolated approach parallel to it and 5. Leadership.
Civilization is complex between catastrophe and education, it is said. When we build a dyke we protect the present but when we teach we protect the future.

Questions and Comments from floor

Q: What is Artech? Is there any website? Community is the first responder and it is also the also the last one. The fact that the community is the first responder is very clearly visible because it could reduce the impacts. Once the external interventions are withdrawn, it is the communities who remain there and start living the normal life.

- Kawabe: Art and technology meets to become Artech. The website is http://www.artech.or.jp/. The creation of a sustainable 21st century should not be mere the extension of the 20th century but more than that. In 20th Century, we witnessed drastic degradation of the cultural, ethical and moral values supported by the rapid expansion of technologies. The aim is that the science in combination with culture should rejuvenate the environment. Such a combination is ideal because both poor and rich countries could equally invest in culture and hence the culture acts as a counter-balance to the ill effects of technology.

Q: The Saijo example is interesting. In his previous lecture, Prof Kobayashi said that the choice of constructing the wooden houses should be a personal decision. Saijo city came out with a wooden house concept. How is the government planning to support such an initiative? Is the support at city or individual level?

- Mayor Ito: It is important to know that nearly 16-17% people value the domestic timber and as a result we have poor forests. The country need to grow forests so that the wood can be processed and used for carbon sequestration purposes. The citizens of Saijo had

to revive the city from the typhoon damage and the decision was taken to support wooden houses in certain areas of the city. For this purpose, even a man made forest was created and many trees are mature now. The government could not cut them because the price the wood can fetch in the market was much less. In such scenario, how the government encourage the forests in Japan.

Q: The school in the Prefecture has a DM program supported by the IR network. As a part of this program, the children are trained on DM education. Artech collaboration would be an excellent proposition for our school as the school is not yet involved in networking which is an important aspect as highlighted by your presentation.

- Kawabe: Networking is important. Global warming is becoming more alarming now. There is a need for networking and exchange of information and we are quite behind in this area. As a professor at UNU I have lots of networks being developed and would be happy to support others.

Rajib Shaw: Concluding remarks:

Today, what we learned is try to think on positive process to bring all initiatives to affect a sustainable future. It depends on how we perceive and promote the lessons learned from the past. It also depends on how we educate ourselves and shape our attitudes.

Second lesson is there is no safe city but only a safer city. There could be risks but our role is to minimize the human impacts and reduce the risks. We need to have local champions and we need champions for future as well and they are children

Who's problem it is? Whether it is the peoples'/ communities/national government etc? We need to emphasize the self management. Self management for government refers to how independently it could enhance its capacities in the management of its own problems. For an individual self management refers to how he could manage his own problems and similarly for a family. Self management is a non-scale concept and self management should be given importance.

We always talk about policy implementation. However, the practices from Galle, Saijo, Kids ISO 14000 are simple and grassroot in nature but they can bring and sustain the change for longer time. Good practices last longer even when there is a change in the political system.

Day 8 (30 July) – Departure of Participants

Participants departed to their home country/city.

Presentation materials

Opening Session

Welcome remarks:	Dr. Masashi Kamon Dean, GSGES, Kyoto University
Opening remarks:	Mr. Iida Kazurou Managing Director, ACCU
Introductory remarks:	Dr. Hari Srinivas Chief of UEMU, UNEP-IETC

Welcome Remarks by Dr. Masashi Kamon
Dean, Kyoto University, GSGES

Distinguished guests, ladies and gentlemen.

Good morning everybody, welcome to the Action Workshop on Education for Sustainable Development: Participatory Urban Risk Management.

On behalf of the Graduate School of Global Environmental Studies, I would sincerely extend to you the warmest welcome to Kyoto University, and wish you all the enjoy your participation to the workshop during this week.

We are facing the tragic natural and man-made disasters all over the world. They become to be much harder last decade. This workshop will try to find the solutions on issues of urban risk management with community commitment, and the socio-economic issues, emphasizing the importance of an environmental friendly urban area that will lead to a safe and secure society.

The Graduate School of Global Environmental Studies in Kyoto University was inaugurated in April 2002 aiming to establish a new horizon of the global environmental studies. It is highly important for us to integrate as one discipline all the academic fields that currently address global environmental issues. Since global environmental problems include many complex issues on every scale from the global to the local, I strongly believe that the international cooperation through like as this workshop will lead to integrate diverse academic and practical endeavors in the pursuit of a more truly global environmental studies. Our graduate school opened Asia Platform in Vietnam as one of the international exchange program last year. Its purpose is also education and research cooperation on environment and disaster management for human security in Asia.

I hope all of us having a fruitful discussion and good communication during the workshop. As a result, our collaboration work becomes more active and tight and I expect it will be one of the leading research groups in the Global Environmental research field.

Kyoto was the Japanese capital for more than 1000 years. Therefore, we have many historical sites and stories in the city. I hope you will visit and enjoy these during and after the workshop, if possible. They will give you a marvelous experience in the cultural variation/diversity.

Please enjoy this workshop and make new friends through the active discussion.

Thank you for your attention.

Opening Remarks by Mr. Iida Kazurou, Managing Director, ACCU

Thank you for the introduction. My name is Iida Kazurou, Managing Director of ACCU, which stands for Asia Pacific Cultural Centre for UNESCO. Today, on behalf of ACCU as one of the co-organizers, I would like to say a few words as opening remarks for this workshop to be conducted under the "ACCU Invitation Programme for International Educational Exchange of Teachers and Professionals."

First I'd like to extend my cordial welcome to the experts and professionals from 11 countries participating in this workshop. As you may know, UNESCO (United Nations Educational, Scientific and Cultural Organization) launched the International Flood Initiative (IFI) in cooperation with the World Meteorological Organization (WMO) and others in the World Conference on Disaster Reduction held in Kobe in 2005.

It also plans to set up a global network of Tsunami and other coastal hazards warning systems, which will cover the entire region prone to earthquakes and Tsunamis, expanding the area covered from the Pacific and Indian Ocean to others. In terms of education, UNESCO is undertaking the project called "Education for Natural Disaster Preparedness in Asia-Pacific within the context of ESD" supported by the Japanese Funds-in-Trust for ESD within the framework of the UN Decade of Education for Sustainable Development (DESD), which was initiated in 2005 through a proposal of the Japanese Government.

In line with these activities by UNESCO, ACCU is currently developing the fourth title of the package of learning materials on environment, called PLANET, on disaster prevention for community empowerment. We have also collected existing printed materials on disaster prevention focusing on tsunami and earthquake in Asia and the Pacific. From these, 28 titles have been selected and compiled into a synopsis entitled "Material Development on Disaster Prevention for Community Empowerment".

In terms of capacity development, also under the framework of the "ACCU Invitation Programme for International Educational Exchange of Teachers and Professionals", we organized a training workshop titled "Environmental Education to Develop Management Systems for the Local Environment" in 2003 in cooperation with the United Nations Environment Programme - International Environmental Technology Center (UNEP-IETC), which has been our partner for a long time and also supports this workshop.

As part of these activities of education for disaster prevention, we are greatly honored to co-organize this workshop with the full cooperation of Kyoto University led by Mr. Kamon, Dean of the Graduate School of Global Environment Studies, UNEP-IETC, and SEEDS International.

Natural disasters such as typhoons, torrential rainfall and floods cause considerable damage in many countries in the Asian region every year. To mitigate this damage, it is very important for experts like you to share knowledge and experiences, and to discuss measures for safer urban environment and essential roles of education.

I highly hope that this workshop will engender fruitful discussions and be a significant step forwards towards concrete actions that are necessary to realize sustainable urban environment.

Thank you.

Introductory Remarks by Dr. Hari Srinivas, UNEP-IETC

Good morning, Ladies and Gentlemen. It gives me great pleasure to make these introductory remarks. I am here representing the Untied Nations Environment Programme, or UNEP, one of the co-organizers of this programme.

UNEP comes to this meeting from two perspectives – firstly, the trend of an increasing percentage of humanity to stay in urban areas and cities, and the inherent risks that this trend represents. As more and more people live in higher densities and smaller areas, their vulnerability to even a small hazard or risk increases exponentially. Many of these risks are in many cases, a direct result of such proximate result.

Secondly, the interlinkages of environmental degradation and disaster risk. Degradation of the environment increases the risk of disasters and their negative impacts. Simultaneously, disaster events not only have human impacts, but environmental ones as well. Understanding the cyclical links between the environment and disasters lies at the core of UNEP's work in the field, and the policy niche that it has carved for itself.

This training programme brings together these and related themes in an integrated manner and represents an important part of UNEP's commitment to build capacity at the local level on these and related issues, and we are happy to partner with ACCU and Kyoto University to organize this event.

I look forward to an interactive and intense week of interaction and learning!

Thank you!

Keynote Lectures (24 August 2006)

“Disaster Management: New Insights, Perspectives and Research Challenges”
Dr. Norio Okada, Professor, DPRI, Kyoto University

“Ecological Democracy and Ecologically Sustainable Urban Environment in Japan”
Dr. Kazuhiro Ueta, Professor, GSGES, Kyoto University

Disaster Management : New Insights, Perspective and Research Challenges

Norio Okada
Professor, DPRI, Kyoto University
Action Workshop on Education for Sustainable Development, UNESCO, Kyoto
July 24, 2006

What I want to stress today.

- Integrated Disaster Risk Management (IDRiM) Promoted
- Disaster Management for a single hazard/disaster
- Disaster Management for multiple hazards/disasters
- Disaster Management for stakeholders in cities, regions and communities
- Urban/regional/community Management with Disaster Management being a critical component
- More Participatory Disaster Risk Management Needed as a Part of IDRiM Governance
- People's Attitudes and Behaviors to Disaster Risk

more studied by adaptive management.

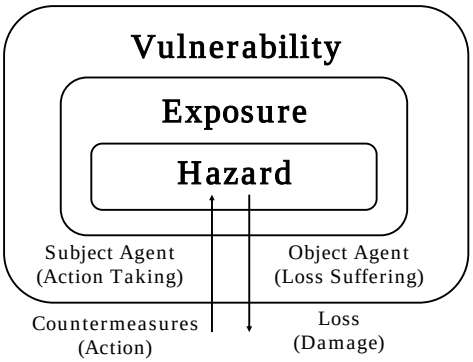
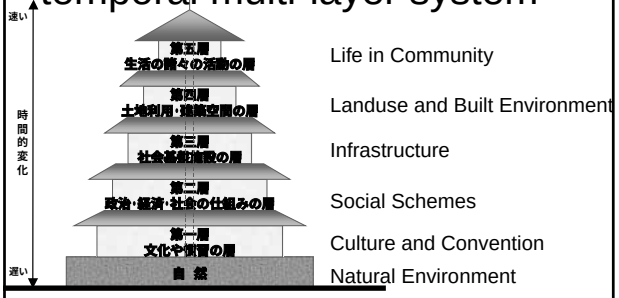
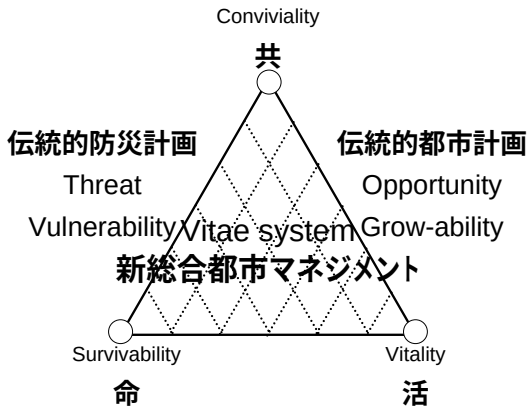


Fig.2 variant of prototype scheme For disaster risk management

City/regions viewed as spatial-temporal multi-layer system



Five-storied Pagoda Model



Lessons Learned from the 1995 Hanshin-Awaji Earthquake

- Self-rescue/relief (**自助･共助**)**力** → Enhancement of coping capacity
- Day-to-day Practice for the Ownership of Knowledge and Technology (Lessons Implemented) Long-range proactive management to be switched to retroactive management
- Strategy to Overlap with Urban/Regional Management

However

- Lessons are rediscovered after a (low frequent-high impact) disaster and commonly unlearned before!
- Integrated disaster risk management (IDRiM) should be developed.
- Implementation is a key issue.
- Research and Practice should be more overlapped .Theories and Empirical Approach should go hand in hand, adaptively.

Messages Behind

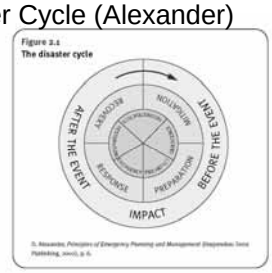
- Seemingly non-related items must have their relevant foundation
- Some missing perspective should be developed!
- Integrated management, sustainable management, and viewing cities and regions as a whole of living body.

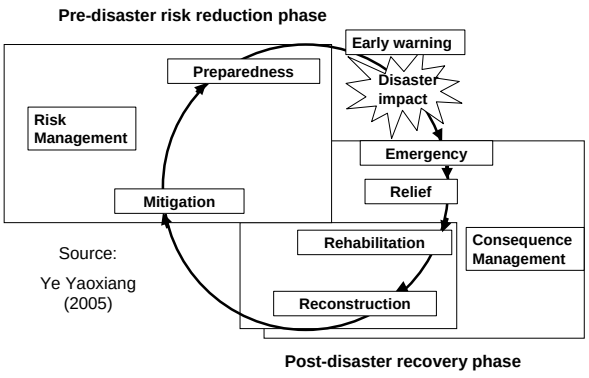
Integration is needed in

- Integration **DD**: Combining both **daily** and **disaster** mode (disaster and non-disaster cycle),
- Integration **MD**: Dealing with **multiple** hazards and **disasters**,
- Integration **KP**: Systematizing and linking a piece of particular, specialized **knowledge and technology** to relevant **policy concerns and governance** issues,
- Integration **DU**: Linking **disaster** management to **urban planning and management**,
- Integration **KD:** Spanning a gap between what we **know** and what we do= **Implementation knowledge,**
- Integration **MA**: **Methodological** Development by **Adaptive Management**

Integration **DD**:
Combining both **daily** and **disaster** mode (disaster and non-disaster cycle),

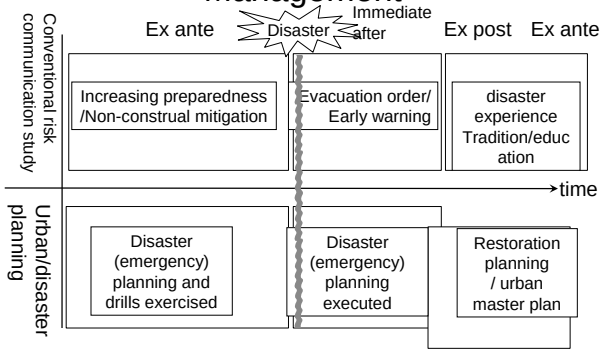
Disaster Cycle (Alexander)



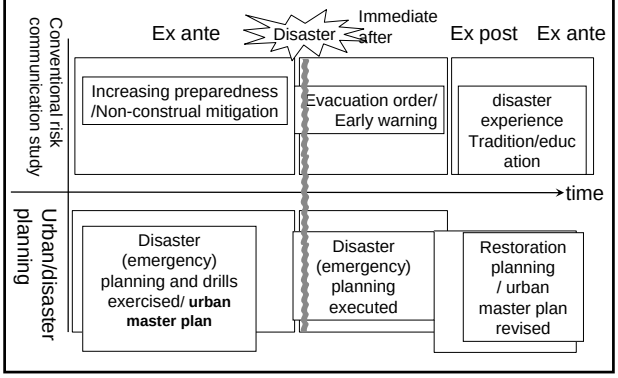


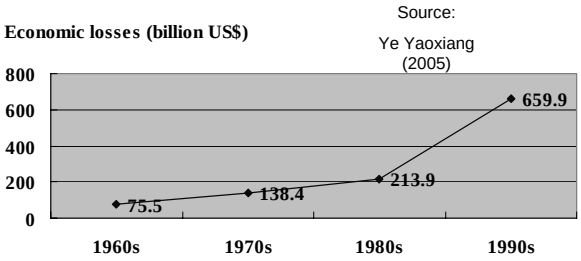
Source:
Ye Yaoxiang (2005)

Proactive and Retroactive Disaster Management

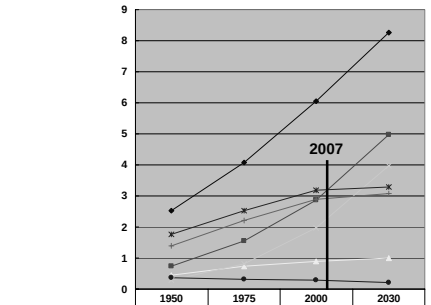


Integration **DU**: Linking **disaster** management to **urban planning and management**





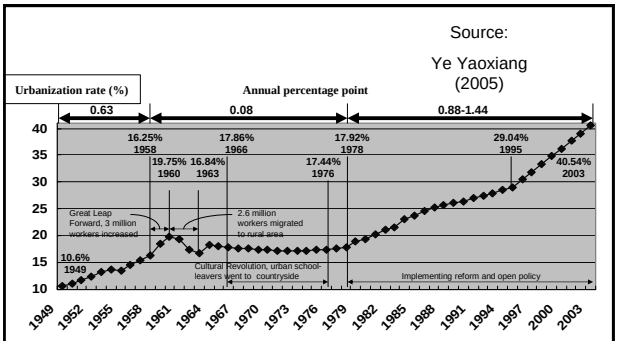
Annual averaged economic losses caused by natural disasters in 1960s-1990s



	1950	1975	2000	2030
Total	2.52	4.07	6.06	8.27
Urban	0.75	1.55	2.87	4.98
Developd Urban	0.45	0.74	0.9	1
Developing Urban	0.3	0.81	1.97	3.98
Rural	1.77	2.52	3.19	3.29
Developd Rural	0.37	0.31	0.29	0.21
Developing Rural	1.4	2.21	2.9	3.08

World population (billions)

http://www.un.org/esa/population/publications/wup2001/WUP2001_CH1.pdf



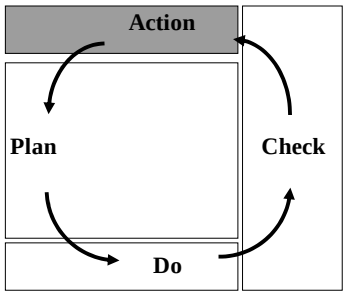
China's Urbanization Rate

Integration **KP**: Systematizing and linking a piece of particular, specialized **knowledge & technology** to relevant **policy concerns and governance** issues

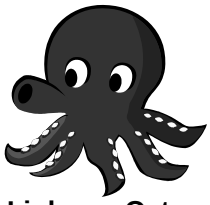
- This world is now a man-techno-complex system society.
- Governance is indispensable but its knowledge unexplored yet.
- Participatory approach on different levels of social autonomy is just one way of achieving a governance scheme.
- Adaptive management is one of way of governing the man-techno-complex system society.

Participatory Approach based on a Workshop Method

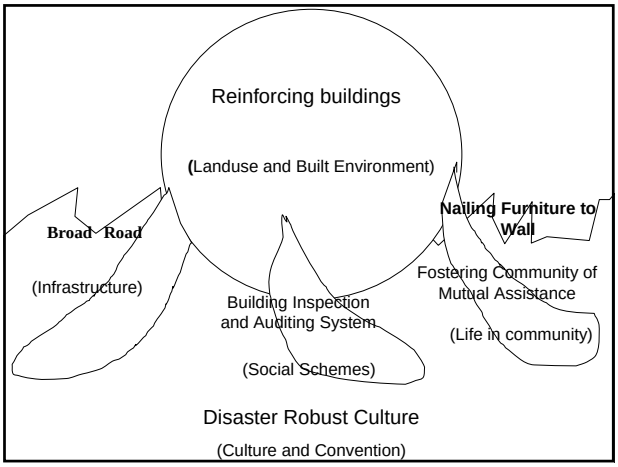
As a PDCA Cyclic Process



Integration **KP**: Systematizing and linking a piece of particular, specialized **knowledge & technology** to relevant **policy concerns and governance** issues



Policy Linkage: **Octopus Model**
(Okada,2002)Multidisciplinary Approach
We need multiple legs (polyped) which cling to other interface areas.



Integration **KD:** Spanning a gap between what we **know** and what we do= **Implementation knowledge**

Three types of missing knowledge and One Already there

- Frontier knowledge: Still much unknown (eg. Location of active faults)
- Existing knowledge: Already much known (eg. Lessons learned from past disasters, predicted typhoon/hurricane approaching real-time.)
- Implementation knowledge: Yet much unknown (eg. how to encourage and let people practice furniture nailing; still tacit and not formalized)
- We do not know enough about the above fact. (eg. Self-isolation and Mindset by specialization)

Hurricane Catherina **Well Imagined A year ago!**

- **When did this calamity happen? It hasn't—yet. But the doomsday scenario is not far-fetched.** The Federal Emergency Management Agency lists a **hurricane strike on New Orleans as one of the most dire threats to the nation, up there with a large earthquake in California or a terrorist attack on New York City.** Even the Red Cross no longer opens hurricane shelters in the city, claiming the risk to its workers is too great.

Gone with the Water

National Geographic Magazine, Oct. 2004

By Joel K. Bourne, Jr.Photographs by Robert Caputo and Tyrone Turner

The Louisiana bayou, hardest working marsh in America, is in big trouble—with dire consequences for residents, the nearby city of New Orleans, and seafood lovers everywhere.

Continued
Gone with the Water
National Geographic Magazine, Oct. 2004
By Joel K. Bourne, Jr.Photographs by Robert Caputo and Tyrone Turner

"The killer for Louisiana is a Category Three storm at 72 hours before landfall that becomes a Category Four at 48 hours and a Category Five at 24 hours—coming from the worst direction," says *Joe Suhayda, a retired coastal engineer at Louisiana State University who has spent 30 years studying the coast.* Suhayda is sitting in a lakefront restaurant on an actual August afternoon sipping lemonade and talking about the chinks in the city's hurricane armor. **"I don't think people realize how precarious we are,"** Suhayda says, watching sailboats glide by. **"Our technology is great when it works. But when it fails, it's going to make things much worse."**

Continued
Gone with the Water
National Geographic Magazine, Oct. 2004
By Joel K. Bourne, Jr.Photographs by Robert Caputo and Tyrone Turner

Such **high stakes compelled a host of unlikely bedfellows—scientists, environmental groups, business leaders, and the U.S. Army Corps of Engineers—to forge a radical plan to protect what's left.**

Drafted by the Corps a year ago, the Louisiana Coastal Area (LCA) project was initially estimated to cost up to 14 billion dollars over 30 years, almost twice as much as current efforts to save the Everglades.

Why NOT IMPLEMENTED?!!

Mindset and Excused by High Priority Issues

Improving Communication and De-segregation

Managing Poverty

Increasing Risk Awareness and Capacity Building for Evacuation (Social-Colearning)

Structural Measures for Disaster Prevention

Nailing Furniture to the Wall (a Japanese Experience)

- Everybody agrees it's important, but
- Very few people practices it. Why so??
- Hypotheses to be continuously tested (for example):

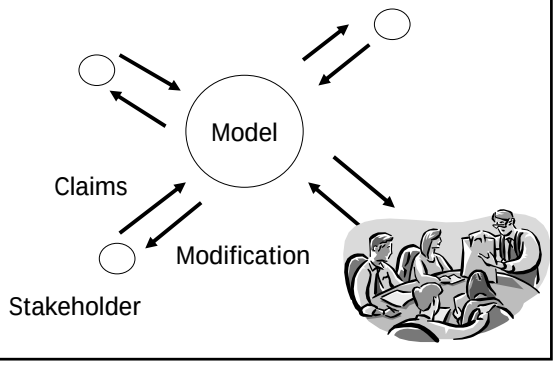
There are different groups of peoples with different attitudes.
We need to identify some appropriate target people.
→ "Social Marketing" Methods may be needed.
Typology hypothesized:

- I am eager to learn and practice it. Then I would like to assist others.
-So far it was all right without it, so it will always be all right with me.
-It is troublesome and I have more important things to do.
-I would like to find some one who can help me but don't know who he/she is.
-Even if I can find someone like that, I still feel uncomfortable to have him/her step in my bedroom.

Workshop and participatory approach may or may not work

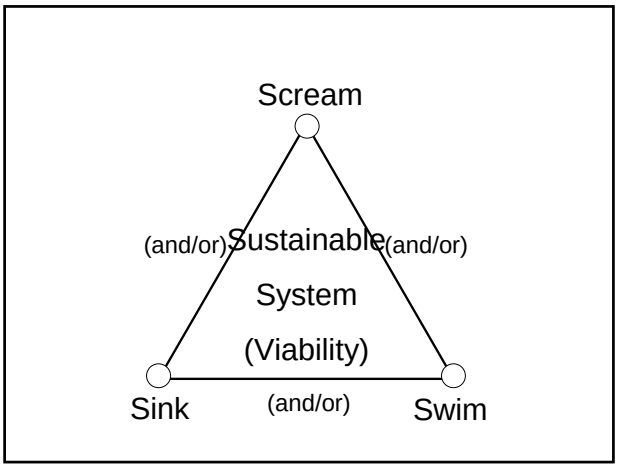
- Adaptive management in a PDCA cycle process
- **Hypothesized models/policies**
- Proactive approach
- **Continuous monitoring**
- Evaluation of process development
- Formalization of implicit knowledge
- **Social co-learning by specialists,students and residents**, like capacity building for Tsunami disaster in inexperienced regions
- **Cultural calibration through cross-country monitoring**

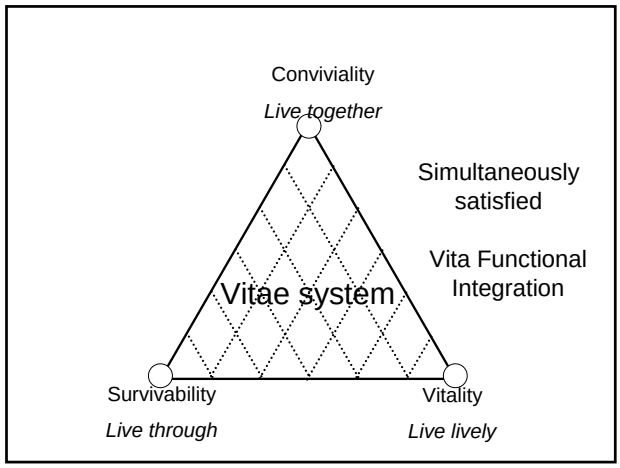
Collaborative Modeling

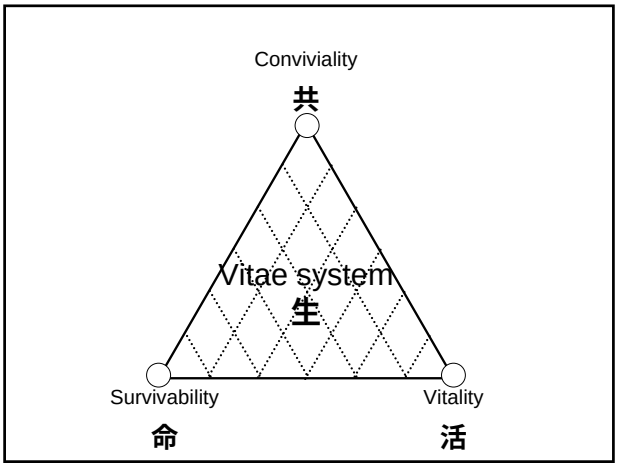


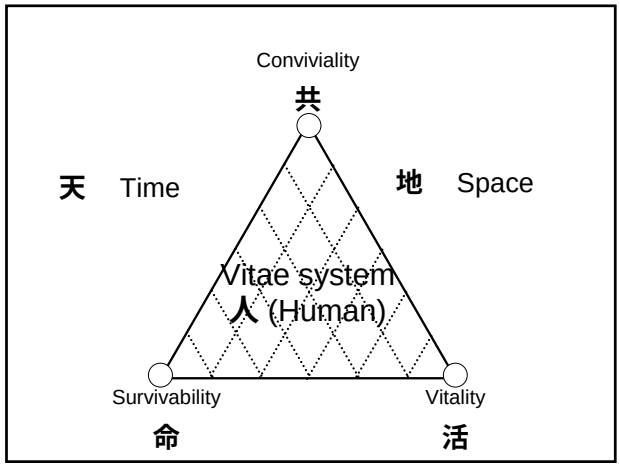
Missing Knowledge of Sustainability: Vital Integration

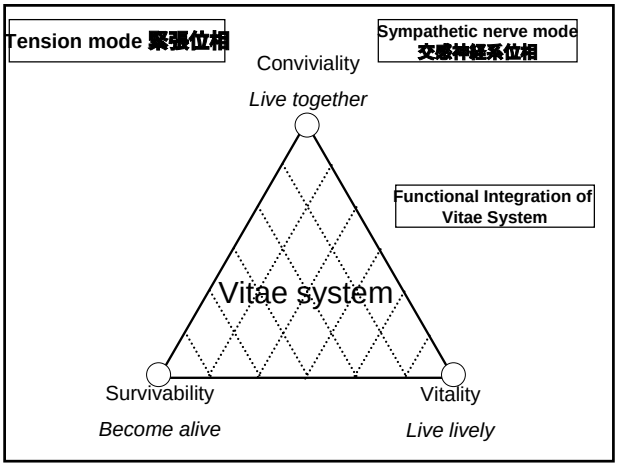
- Vitae system (Living body) as both the object and subject of Sustainable Management
- Three functions as a systemic (organic) whole.
- (1)To live through (to survive)
- (2) To live vigorously (to vitalize)
- (3) To live together with others (to con-vive)
- To build resilient capacity should mean dynamic and rhythmic balance of the whole in tension and relaxation over time.

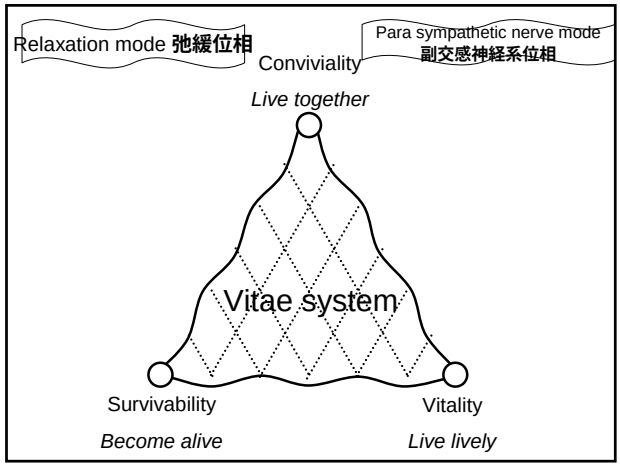

Scream
(and/or)
Sustainable
System
(Viability)
(and/or)
Sink
(and/or)
Swim


Conviviality
Live together
Simultaneously satisfied
Vita Functional Integration
Vitae system
Survivability
Live through
Vitality
Live lively

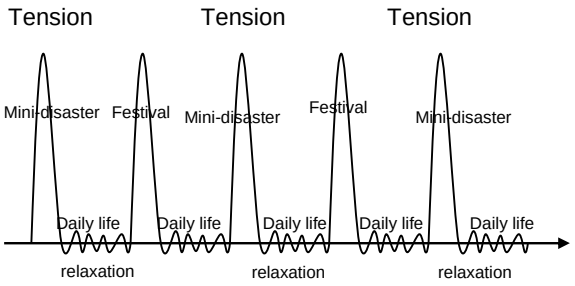

Conviviality
共
Vitae system
生
Survivability
命
Vitality
活


Conviviality
共
天 Time
地 Space
Vitae system
人 (Human)
Survivability
命
Vitality
活


Tension mode 緊張位相
Sympathetic nerve mode
交感神経系位相
Conviviality
Live together
Functional Integration of Vitae System
Vitae system
Survivability
Become alive
Vitality
Live lively


Relaxation mode 弛緩位相
Conviviality
Para sympathetic nerve mode
副交感神経系位相
Live together
Vitae system
Survivability
Become alive
Vitality
Live lively

Vital Rhythms



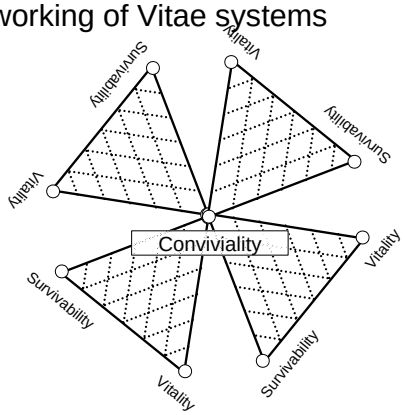
Vitae System Dynamics

- S=Survivability, V=Vitality, C=Convivality
  E=Environment, t=time
- S (t) as Stamina= Function of V (t) and C (t).
- V (t)=Function of S (t) and C (t).
- C (t)=Function of S (t), V (t) and E (t).
- S (t), V (t) and C (t) are mutually interactive and interdependent.
- The Dynamism is highly nonlinear and complex.
- The System is semi-open-ended.
- The 21st century still misses the knowledge of this kind.
- This is a part of implementation knowledge (science).

Networked Vitae System

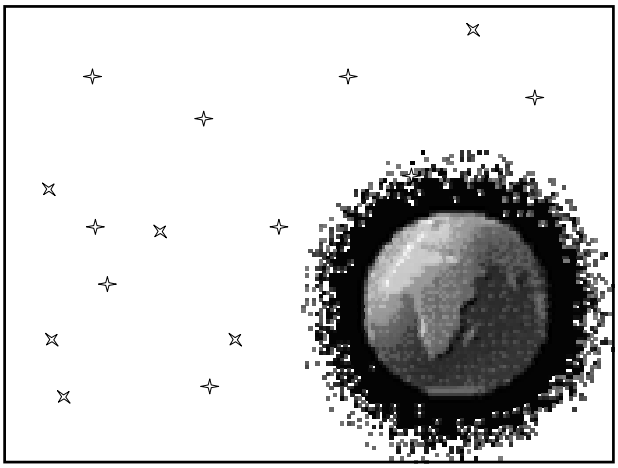
- Every vitae system covers a marginally extended and thus a more resilient system is expected.
- Thus each governs the area of one's own locality, and thus to be networked to service the entire region.

Networking of Vitae systems



In conclusion

- Integrated Disaster Risk Management (IDRiM) Promoted
- Disaster Management for a single hazard/disaster
- Disaster Management for multiple hazards/disasters
- Disaster Management for stakeholders in cities, regions and communities
- Urban/regional/community Management with Disaster Management being a critical component
- More Participatory Disaster Risk Management Needed as a Part of IDRiM Governance
- People's Attitudes and Behaviors to Disaster Risk more studied by adaptive management.



A Broader Perspective Needed

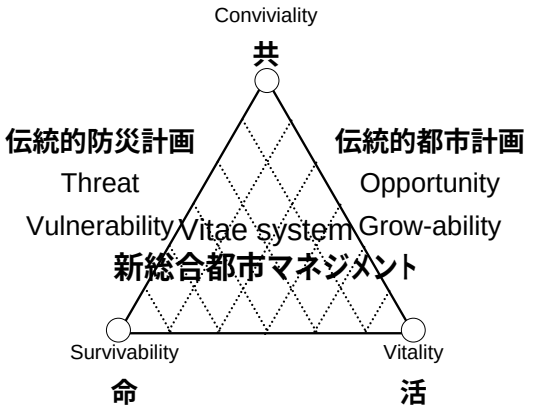
- Cities and Regions as Our Common Spatial-Temporal Platform
- With Strengths (Grow-abilities) and Weaknesses (Vulnerabilities)
- Under Opportunities (**機**) and Threats (**危**)
- Some Predictable, Some Unpredictable
- Leading to Developments (Ups) and Ruins (Downs)
- Adaptively Managing Spatial-Temporal Systems Behaving like Living Bodies(**生 体**)
- Conceptually Modeled as the "Vitae System" and "Pagoda Model"

New Insights

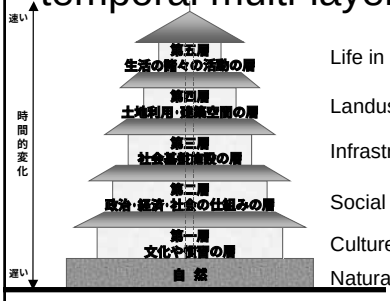
What is it about and

How can we explain, describe and model it?

- Coping Capacity (Limited or Enhanced)
- Carrying Capacity (Limited or Enhanced)
- Breakthrough-making and Small-scale Innovation of Social Systems
- Adaptive Management of "(Semi-)Open-ended Systems"



City/regions viewed as spatial-temporal multi-layer system



Life in Community

Landuse and Built Environment

Infrastructure

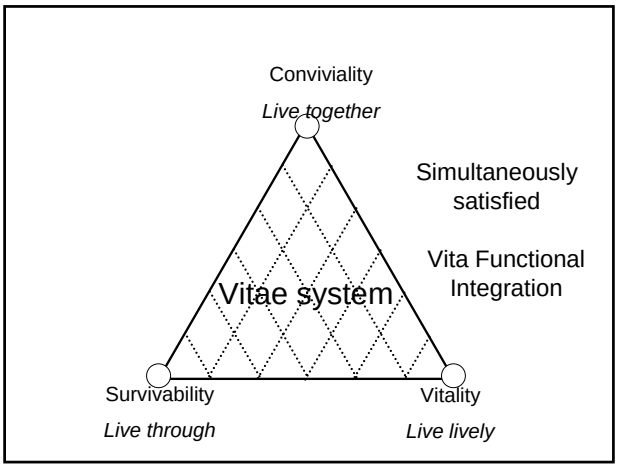
Social Schemes

Culture and Convention

Natural Environment

Five-storied Pagoda Model

Holism


Conviviality
Live together
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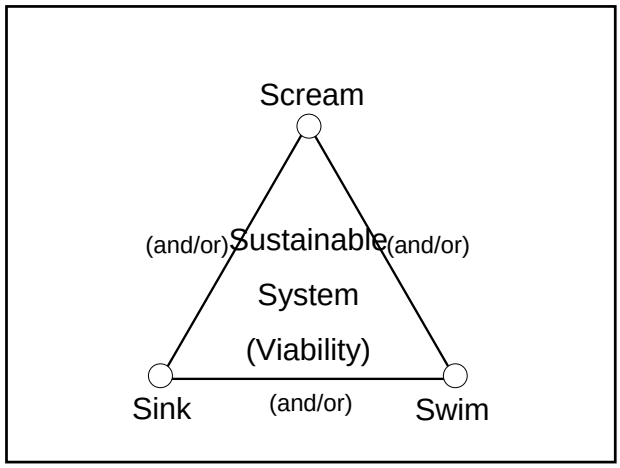
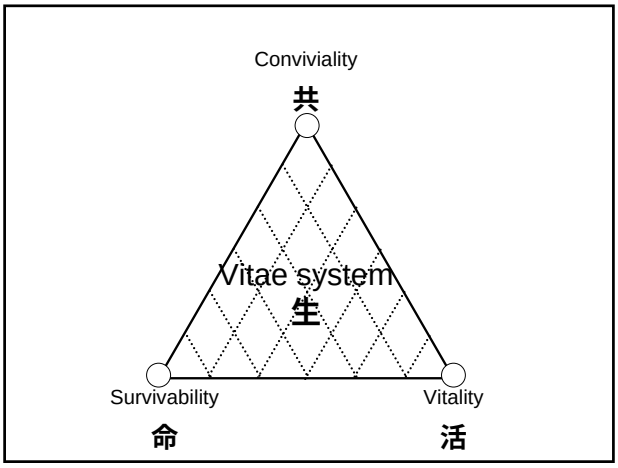
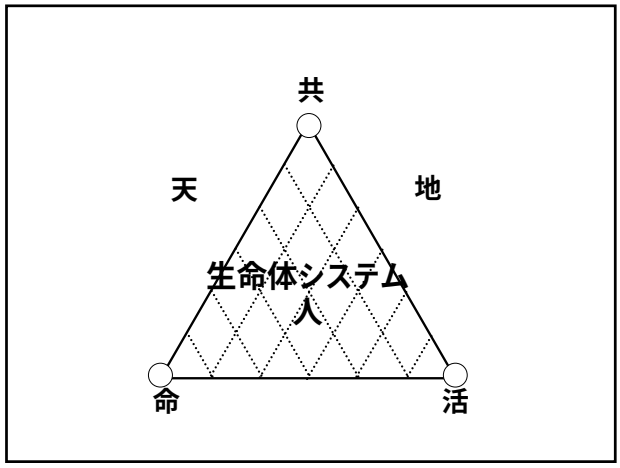
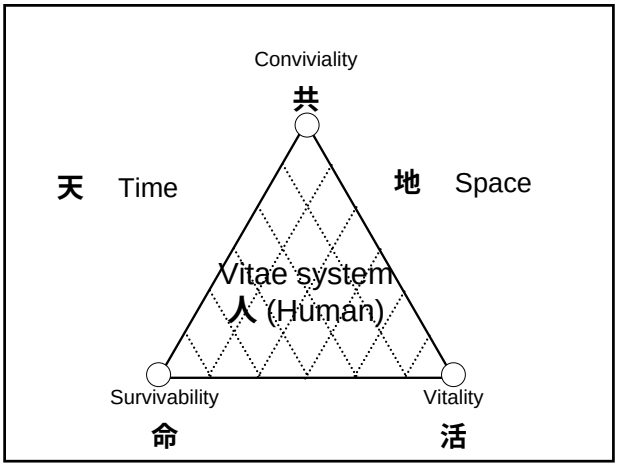
Vitality
Live lively

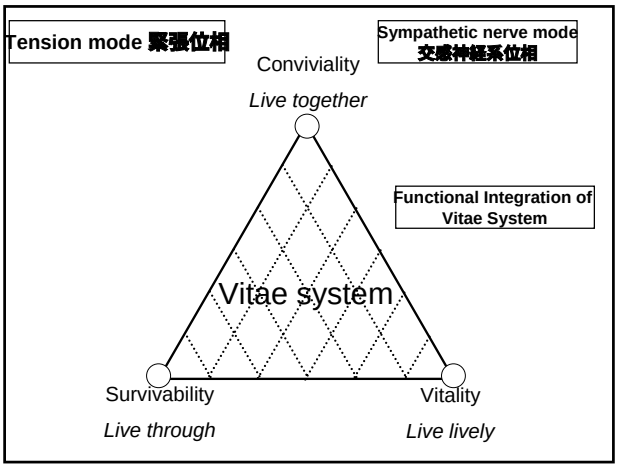

Scream
(and/or)
Sustainable
(and/or)
System
(Viability)
Sink
(and/or)
Swim

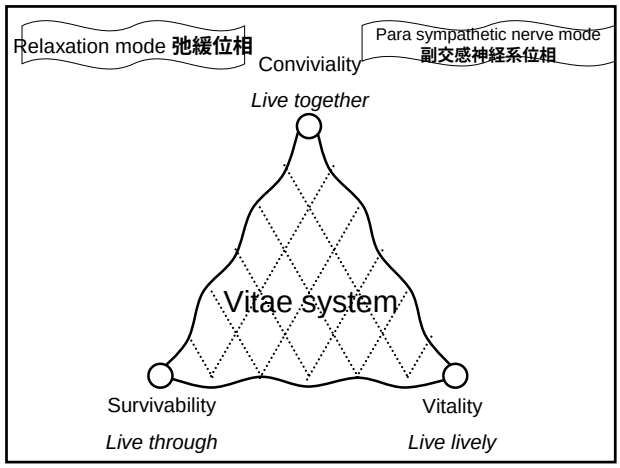

Conviviality
共
Vitae system
生
Survivability
命
Vitality
活

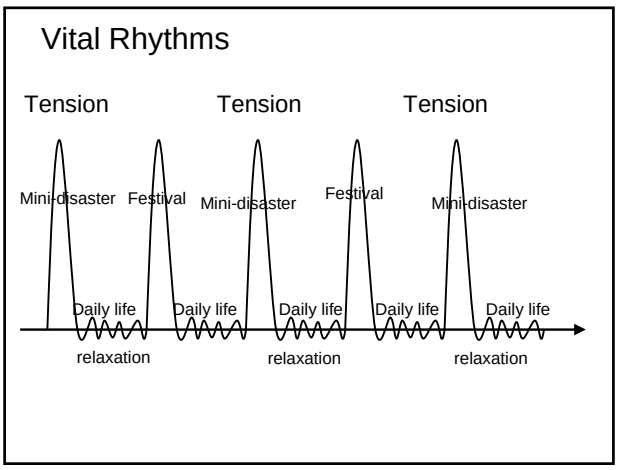

共
天
地
生命体システム
人
命
活


Conviviality
共
天 Time
地 Space
Vitae system
人 (Human)
Survivability
命
Vitality
活

Bio-rhythm







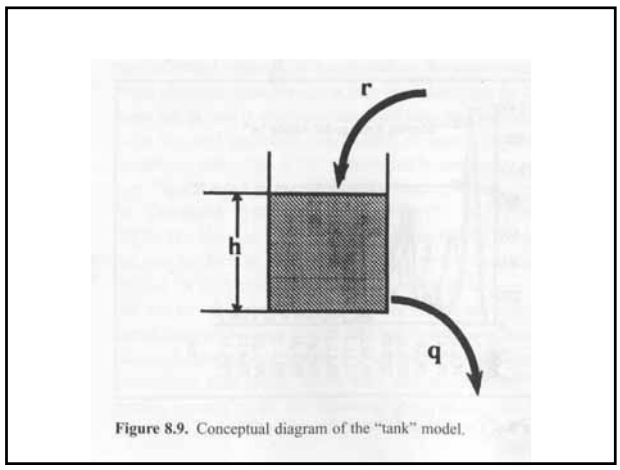


Figure 8.9. Conceptual diagram of the "tank" model.

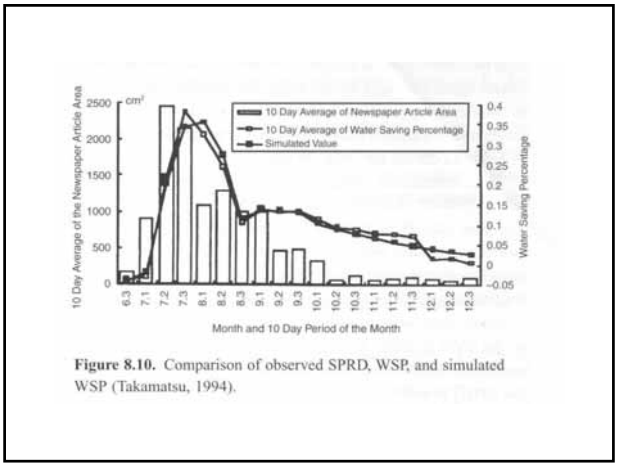


Figure 8.10. Comparison of observed SPRD, WSP, and simulated WSP (Takamatsu, 1994).

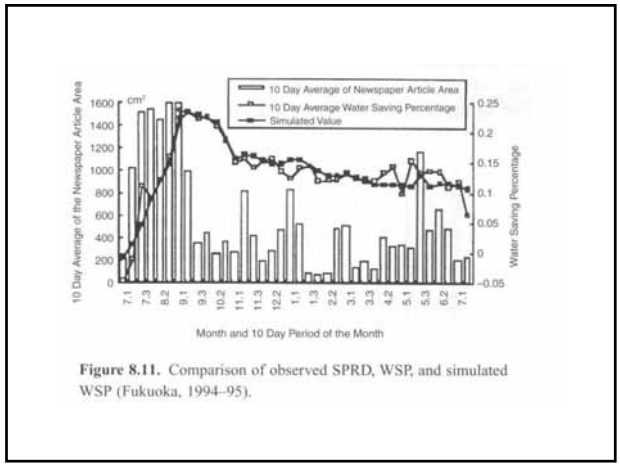


Figure 8.11. Comparison of observed SPRD, WSP, and simulated WSP (Fukuoka, 1994–95).

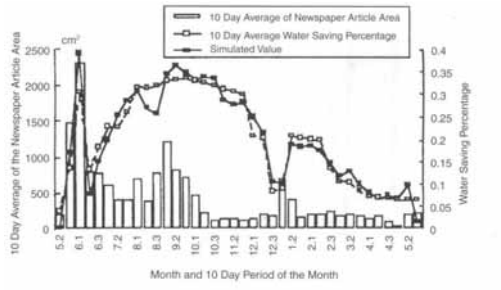
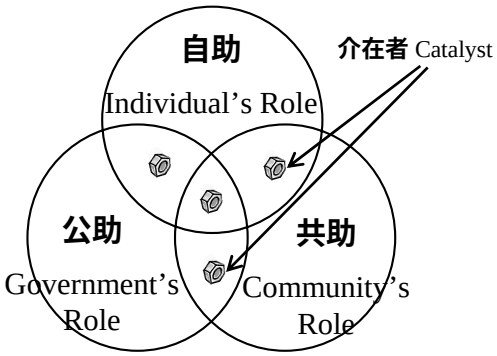


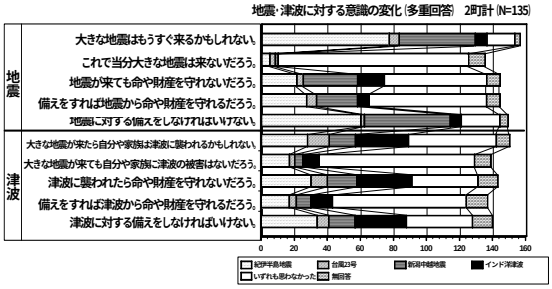
Figure 8.12. Comparison of observed PRD, WSP, and simulated WSP (Fukuoka, 1978–79).

Resilient Capacity to Cope with Inexperienced and Unpredictable Events

- To respond reflexively by use of built-in "fluctuation bio-rhythms, if the external shock is not immense.
- To adaptively take a quantum jump with structural change generated, if the external shock is immense.
- To take a critical choice of "bifurcation paths": enhancement or degradation (ruin) .

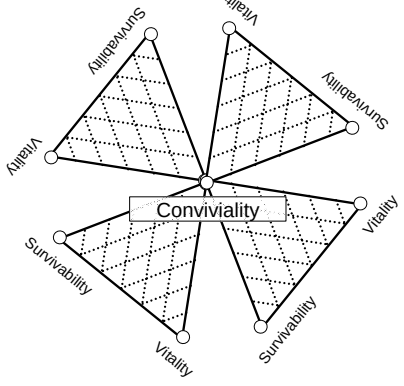


間接的経験と地震・津波に対する意識変化（多重回答）（2町計）松田・岡田



Communalism

Networking of Vitae systems



Ecological Democracy and Ecologically Sustainable Urban Development in Japan

Kazuhiro Ueta ueta@econ.kyoto-u.ac.jp
Kyoto University, Japan

1

Contents

- Purpose of my presentation
- Ecological urban problem in Japan ---Kogai
- From "kogai" to urban sustainability
- Ecological democracy
- Prospects and challenges for sustainable urban development in Japan

2

Introduction

3

Ecological urban problem in Japan ---Kogai (pre-war)

- urbanization with rapid industrialization and economic growth in modernization
  - ✓heavy metal pollution by mining (ex. Ashio)
  - ✓Locating factories in rural area
  - ✓Poor dwellings and unhealthy living environment

4

Ecological urban problem in Japan ---Kogai (post-war)

- Kogai as social problems
  - ✓Pollution from heavy and chemical industries
  - ✓Minamata disease (1950s~)
  - ✓Failure of market and government

5

Fetal Minatama disease patient and her mother

6

Ecological urban problem in Japan ---Kogai (high economic growth) (1)

- Industrial complex pollution in high economic growth

7

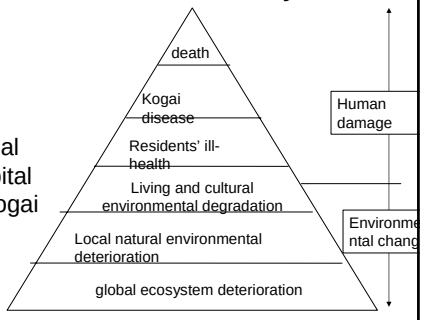
Ecological urban problem in Japan ---Kogai (high economic growth) (2)

- Consumeristic way of life and Kogai
  - ✓Urban traffic infrastructure
  - ✓Complex pollution in urbanized areas
- a degree of advancement
  - ✓Environmental legislation
  - ✓Life-oriented local policy

8

Kogai ---crisis of local community

Lack of community capacity to manage social common capital to prevent Kogai



Source: modified Miyamoto(1989)

9

Urban sustainability

- ecological and socio-economic sustainability
- Integration of ecological, social, economic and cultural considerations
- Community capacity-building to manage social common capital for urban sustainability

10

From Kogai to urban sustainability

- Social common capital and sustainability
  - ✓ Natural environment and resources, physical and 'institutional' infrastructure
  - ✓ 'Social management according to social criteria' (Uzawa, 2005)
  - ✓ Ecological democracy to manage social common capital

11

Frame of ecological democracy for sustainable urban development (1)

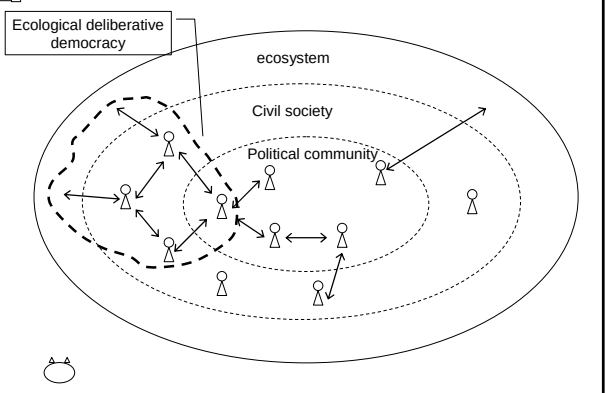
- Collective decision-making system that can deal with ecological problems
  - ✓ Participation and environmental citizenship
  - ✓ Deliberative environmental valuation
  - ✓ Creating discursive space

12

Frame of ecological democracy for sustainable urban development (2)

- Deliberation as communication
  - ✓ Ecological communication
    ---voice of nature (Dryzek, 1995)
  - ✓ Political communication
    ---representative democracy
  - ✓ Social communication
    ---integrative motive of ecological and political communication

13



14

Prospects and challenges in Japan

- Urban planning system to manage social common capital
  - ✓ some local governments come to open their planning process to citizen
  - ✓ Decisions reflect deliberation?
  - ✓ Empowering local governments
- difficulties

15

Conclusion:

Prospects and challenges in Japan

- Social communication encourage capacity-building of SCC management generate pressure to collective decision-making (political decision) for
  - ✓ vitalize citizen's deliberation
  - ✓ Movement against Kogai
  - ✓ Evolution of social movement
  - ✓ Pressure to the content of public policy

16

Video Conference

Presentation of Dr. Ian Davis, Kyoto

Presentation of Mr. Ramon Santiago, Manila

Presentation of Mr. Zubair Mursherd, Bangkok

Presentation of Mr. G Padmanabhan, Delhi

Presentation of Dr. Hari Srinivas, Kyoto

Video Conference on Urban Risk Management

Kyoto, Tokyo, Manila,
Bangkok, Delhi
24 July 2006

Urban Risk Issues

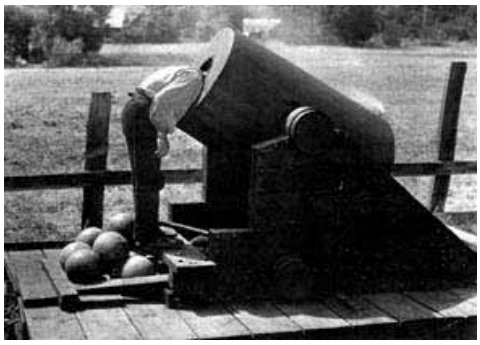
Ian Davis
Visiting Professor Kyoto University
July-October 2006

The Task:

"Urban disaster risk is managed and mitigated by creating an enabling environment through building the capacity of stakeholders, use of information on hazard potential, facilitating structural and non-structural interventions and effective emergency response planning process."

Asian Disaster Preparedness Centre

But is anyone aware of the scale of the problem…?



SWOT ANALYSIS OF URBAN RISK

This presentation will suggest some urban risk issues and actions needed using the headings of :

- STRENGTHS
- WEAKNESSES
- OPPORTUNITIES
- THREATS

STRENGTHS

STRENGTHS: Knowledge

1. During the past decade this subject has been given considerable emphasis with the result that we now know much more about the complex dynamics, problems and opportunities in addressing the multiple risks faced in urban areas.

STRENGTHS: Tools

2. We now have some useful tools available to assist in urban risk management (GIS, INTERNET, Action Planning, Participatory Urban Appraisal, Community Based Disaster Risk Management etc.) These tools are now widely used and prices are dropping for GIS.

STRENGTHS: User-Driven Housing

3. UN HABITAT have been setting an excellent example of the value of User Driven Safe Housing with management / construction placed in the hands of the users.

   Recovery programmes in Afghanistan, Sri Lanka, Aceh and Pakistan have all demonstrated the effectiveness and added value of this approach.

STRENGTHS: Business Continuity

4. Since 9/11 there has been a massive growth in business continuity planning- good news for the protection of people, property as well as urban economies, *(and Business Continuity Consultants!)*

STRENGTHS: Public Awareness

5. There has been a belated acceptance of the need to build public risk awareness at all levels starting with school children.

   This supports Franklin McDonald's statement :

   "The most effective defence against a disaster is a well prepared community".

WEAKNESSES

WEAKNESSES: Risk Integration

1. We are still a long way from adopting an integrated approach to address everyday risks as well as less frequent hazard threats. But should resources be deployed in any priority order, determined by the scale of the threat?

(i.e. Road Safety, Health Risks, Industrial Threats, Urban Fires, Heat Stress, Criminal Violence and Natural Hazards)

Risks of death, (in priority order) facing American citizens

- **Heart Disease** 1 in 5
- **Cancer** 1 in 7
- **Motor Accident** 1 in 84
- **Firearm attack** 1 in 314
- **Drowning** 1 in 1,008
- **Fire/Smoke** 1 in 1,113
- **Air Crash** 1 in 5,051
- **Hot Weather** 1 in 13,729
- **Earthquake** 1 in 117,127
- **Flood** 1 in 144,156

US National Safety Council 2003 data

WEAKNESSES: The Scale of Urban Vulnerability

2. Urban Disaster Risks are rapidly expanding due to urbanisation, industrialisation and population growth pressures.

For example Tehran, (with a night time population of 11 million and a daytime population of 13 million) is sitting on a series of highly active seismic faults . Estimates of casualties from a major earthquake affecting the city, range from 380,000 to several million deaths.

Tehran, a city at risk…

WEAKNESSES: Critical Facilities

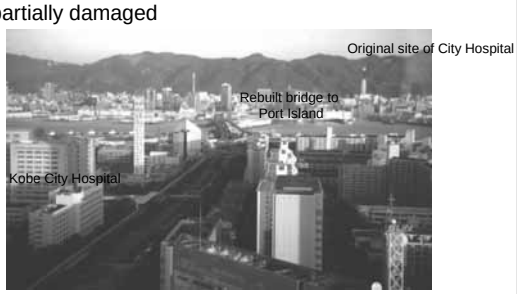
3. Recent disasters: (Bam, Aceh, Katrina, Balakot), have all demonstrated that Governments are failing to protect vital buildings and infrastructure from hazard threats.

(Schools, Colleges, Hospitals, Government Buildings and Records. Water Supplies etc.)

300 Schools destroyed in the Kashmir Earthquake, over 20,000 children killed

A Vulnerable Critical Facility

The Kobe General Hospital on Port Island Kobe, Japan where the bridge was damaged in the earthquake restricting access of injured people to the main hospital that had also been partially damaged



WEAKNESSES: Urban Risk Management

4. Inadequate Urban Risk Management is resulting in totally unacceptable deaths and property losses. Failings include a lack of preparedness, incomplete evacuation plans and failings of emergency management services.

The failure to plan any evacuation for 134,000 poor citizens of new Orleans when faced with Hurricane Katrina

WEAKNESSES: Lack of Integration of Planning and Disaster Departments

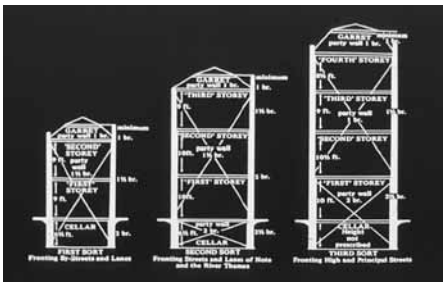
5. There is often a lack of integration or detailed coordination between Government or Urban Disaster Risk Management Offices (if they exist) with Urban Planning Departments. Therefore uncontrolled development proceeds in hazard prone areas building up future risks

OPPORTUNITIES

OPPORTUNITIES: Form follows Failure

1. Disasters generate new leadership, new administrative structures, new technologies, new urban and architectural forms and new ways to reduce risks.

An example of a new building regulation following an urban fire that has remained, the London Building Act of 1666



OPPORTUNITIES: Build from Past Experience

2. Managing Urban Risks does not resemble an artist contemplating a blank canvas. Since both urban risk problems and solutions are not new, we can build on the work of others…

OPPORTUNITIES: Apply and expand existing Urban Risk Management Approaches

Build on the vital work of such groups who organised regional programmes:

- Earthquake and Megacities Initiative (EMI)
- GeoHazards International (GHI)
- Asian Urban Disaster Mitigation Program (AUDMP)

And build on current approaches that focus on risk management in specific cities

OPPORTUNITIES: Capitalise on the Hyogo Framework for Action (HFA)

3. *"Incorporate disaster risk assessments into the urban planning and management of disaster-prone human settlements, in particular highly populated areas and quickly urbanizing settlements"*

HFA (2005) page 12, item (iii) (n)

OPPORTUNITIES: Capitalise on the Power of Cities

4. Urban Areas are becoming increasingly powerful in political and economic terms. Thus they are presenting special opportunities for investment and innovation in urban risk management policies.

OPPORTUNITIES:
Recognise the 'Right' to Safe Shelter

5. Reducing Urban Risks grows from an ethical concern to ensure safe shelter for all urban citizens

THREATS

THREATS

Seeking to address increased risks of all kinds in expanding urban areas is similar to trying to hit a rapidly moving target that is out-pacing the limited global capacities for risk reduction.

ACTIONS NEEDED

1. Urban Risk Management must become a political priority concern
2. Major expansion of pressure/ advocacy groups
3. Consolidation and sharing of knowledge gained
4. Greater focus by NGO's on Urban Safety

ACTIONS NEEDED

5. Urban Authorities need to review the effectiveness of their Urban Disaster Risk Management and Disaster Management systems
6. Urban Risk Assessment needs to cover the full range of risks, and give special attention to protect people and property from the most severe threats.

Post-Scripts…

To manage risks you need to take (sensible) risks….

Urban Risk Management can be an uphill struggle, but if communities are mobilised the task becomes manageable

Managing Urban Disaster Risks requires a high degree of teamwork

Actions are urgently needed, but is anyone listening?

METRO SAFE PROGRAM

an URBAN RISK MANAGEMENT APPROACH

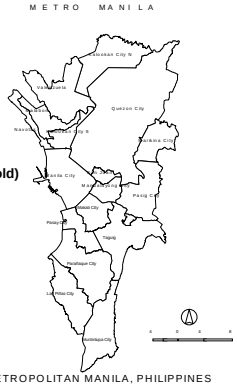
BY RAMON J. SANTIAGO

METROPOLITAN MANILA DEVELOPMENT AUTHORITY
PUBLIC SAFETY OFFICE

METRO MANILA'S PROFILE

COMPOSITION:
- **14 Cities & 3 Municipalities**
- **1,689 Barangays**

LAND AREA - 636 sq. km. (0.2% of Philippines)
POPULATION – 9.9 million in 2000
DENSITY - 16,490 persons/km²
HOUSEHOLDS - 2.0 million (average of 5/household)
- approx. 3.5 million are informal dwellers
GDP - $35.5 Billion
RESIDENTIAL BUILDINGS – 1.3 Million
INFRA & TRANSPORT
- domestic and international air and seaports
- 3 elevated mass transport system
- elevated hi-way and flyovers
HOSPITALS - 177 (26,000-bed capacity)
SCHOOLS - 2,164



METROPOLITAN MANILA, PHILIPPINES

HAZARDS

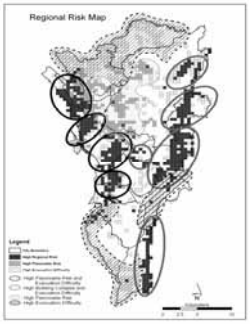
- **average of 20-21 tropical cyclones annually**
- **monsoon rains in the months of July up to November**
- **floods due to topography, drainage problems and indiscriminate waste disposal**
- **presence of seismic fault that could trigger earthquakes resulting to strong ground shaking, landslides, liquefaction, and ground rapture**
- **fires**
- **vehicular, industrial, and workplace accidents**
- **deliberate attack on populace and mass actions**
- **environmental degradation due to polluting activities**

RISK ASSESSMENT APPROACH

- LOCAL RESEARCHES AND INITITATIVES
- OTHER COLLABORATIVE WORKS ON RISK MANAGEMENT WITH INTERNATIONAL ORGANIZATIONS LIKE THE EQTAP PROGRAM WITH EDM-NIED, GESI (UNCRD), AND EMI
- PHILIPPINES REQUESTED THE GOVERNMENT OF JAPAN THROUGH ITS TECHNICAL COOPERATION ARM, JICA TO CONDUCT A STUDY TO DETERMINE THE LEVEL OF RISK OF METRO MANILA TO A STRONG EARTHQUAKE (MMEIRS)

MMEIRS RESULTS

- Metro Manila is found to be at risk and vulnerable to a **7.2 M Strong EARTHQUAKE** that may be generated along an active fault on its eastern part (MMEIRS, 2004).
- The phenomenon adds on to the other hazards that already affect the region like floods, fires, and threat of terrorism.

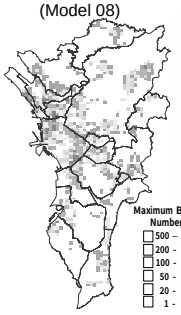


Should this strong earthquake occur within the next 5 years (under a "do-nothing" scenario, it was estimated that:

- 35,000 people may die
- 115,000 would be injured
- 170,000 residential structures can collapse and another 340,000 partially damaged
- 500 simultaneous fires may break out and spread affecting 40,000 to 98,000 buildings
- 10-25% of government buildings will be damaged
- 9 bridges and flyovers may collapse
- Power, water, and communications services will be cut
- National political and socio-economic activities will be disrupted

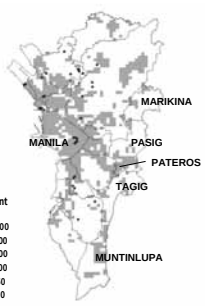

1990 North Luzon Earthquake

FIRE OUTBREAK MAP
(Model 08)

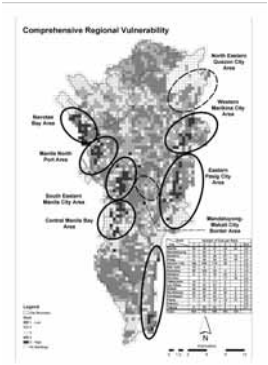


500 Fires may occur simultaneously

POSSIBLE FIRE SPREAD MAP



Factor Used: Wind Speed = 8m/sec
Estimated Results: Area = 1,710 has.
Building: 98,000
Deaths = 19,000



Comprehensive Vulnerability

- Building Collapse
- Flammability
- Evacuation Difficulty

To prevent such a **DAMAGE SCENARIO** and mitigate its impact to Metro Manila, there is a need to:

- Make equipment and resources immediately available to the people to enable them to quickly organize and respond
- Inform, educate and train the people well about the hazards and risks
- Prepare institutions and people to plan for the worst-case event and undertake the necessary measures
- Strengthen the structures and state of present social conditions
- Mainstream Risk Reduction into Planning

Metro SAFE Program

Goal:

Reduce possible damage to Metro Manila and prepare its inhabitants to mitigate and cope with disasters – make METRO MANILA SAFE from all types of hazards, especially earthquakes.

Objectives:

- To raise level of awareness and consciousness on disaster risks and mitigation, and
- To institute quick and effective response by:
  - Developing a core of trained people to handle emergencies
  - Ensuring availability of adequate equipment during crises, and
  - Establishing an efficient system for effecting quick organization at incident areas and coordination of mobilizing resources.

COMPONENT 1

- **HAZARDS AND DISASTER INFORMATION AND EDUCATION**
  - "Safe METRO" Brochures
  - Metro Disaster Managers Newsletter (e-Newsletter)
  - Metro Public Safety Website
  - Mobile " EARTHQUAKE" Project (Simulator)
  - Seminars and Workshops
  - Public Safety Announcements and Advisories

THE MMDA'S PROPOSED
MOBILE EARTHQUAKE SIMULATOR

This earthquake mobile simulator measures **5.03 meters** by **2.47 meters** rests on a single axle tandem trailer

And is moved back and forth by an electro Hydraulic generator, whose speed is controlled by a computer

It is self-powered and has three dimensional movements

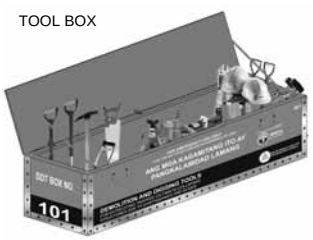
It can be able to simulate up to an 8.0 magnitude earthquake

Students, which is the major beneficiary of this simulator, will be educated on how violent yet survivable a major earthquake can be. This simulator will also be use in the civil engineering class, "Structural Dynamics," and possibly for freshman demonstrations.

COMPONENT 2

- **DISASTER PREPAREDNESS**
  - Disaster Response Equipment Field Storage Units and Team Tool Boxes
  - Organization and Training of Disaster Response Team
  - Response Planning and Response Capability Enhancement

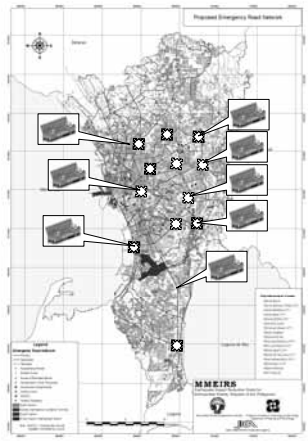
TOOL BOX



DISASTER RESPONSE TOOLS & EQUIPMENT FIELD STORAGE UNIT (DRETFS)

THE MMDA PLAN:

EXPAND CURRENT NUMBER OF STATIONS ALONG THE MAJOR THOROUGHFARES AND DEPLOY DRTEFS UNITS IN IDENTIFIED STRATEGIC AREAS TO MEET CONTINGENCIES ESPECIALLY NEAR THE HIGH RISK AREAS.

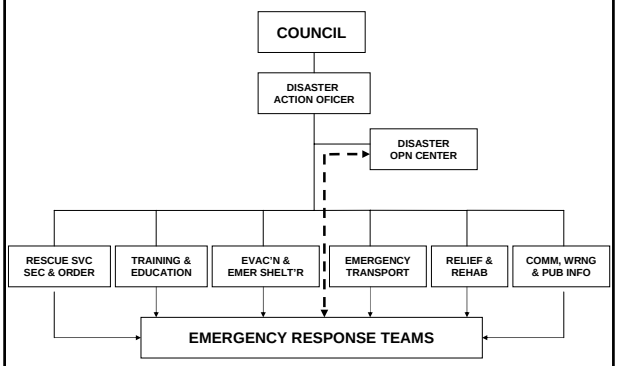


COMPONENT 3

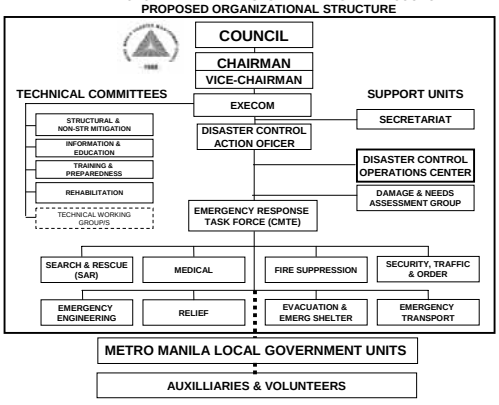
- **EMERGENCY PLANNING AND RESPONSE CAPABILITY BUILDING**

METROPOLITAN MANILA DISASTER COORDINATING COUNCIL

PRESENT ORGANIZATIONAL STRUCTURE



METROPOLITAN MANILA DISASTER MANAGEMENT COUNCIL
PROPOSED ORGANIZATIONAL STRUCTURE



IMMEDIATE IMPACT

- **Increased public awareness and safety consciousness**
- **People are prompted to prepare for disasters and strengthen structures**
- **People are equipped and able to quickly respond to emergencies and to control further damage**
- **Better developed system of response and coordination during emergencies**
- **Reduced vulnerability of high risk communities and sustained economic activities**

PROGRAM ESTIMATED COST

TOTAL PROGRAM COST REQUIREMENT **P 88.162 Million**

1. HAZARDS AND DISASTER INFORMATION AND EDUCATION		**P 27.92 M**
Information Materials	- P 15.42 M	
Mobile EARTHQUAKE Simulator	- P 12.5 M	
2. DISASTER PREPAREDNESS		**P 52.8 M**
Disaster Response Equipment Field Storage (40 units)	- P 8.8 M	
Disaster Response Team Tool Box (1,600 sets)	- P 40.0 M	
Earthquake Disaster Response Team Organization and Training (1,600 teams)	- P 4.0 M	
3. DISASTER MANAGEMENT CAPACITY ENHANCEMENT		**P 7.44 M**
Revitalization of the MMDCC	– P .64 M	
Community-Based Disaster Management Training for Metro LGUs and Barangays	- P 6.8 M	

WHAT HAS BEEN DONE?

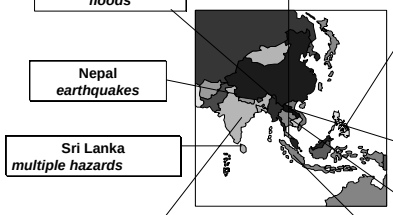
1. Dissemination of the MMEIRS to the 17 LGUs and MMDCC Member Agencies completed. Dissemination to other stakeholders being undertaken on a continuing basis.
2. Mainstreamed Risk Reduction in workshops for Local Building Officials, Municipal /City engineers, Local Development Planning Officers, and Disaster Action Officers/Managers.
3. Conducted Disaster Management Seminars and Workshop in collaboration with PHIVOLCs and LGUs in Pasig City and Barangays in Valenzuela.
4. Training and Organization of Emergency Response Teams of some Metro LGUs and Private institutions such as: Makati Development Corporation (MDC), Engineering and Equipment, Inc. (EEI), Armed Forces of the Philippines Reservist (Philippine Air Force and Philippine Army).
5. In partnership with EMI (International NGO), put up a Earthquake Risk Reduction Tool (Internet Map Viewer) at www.pdc.org/metromanila
6. Ongoing Revitalization of the Metropolitan Manila Disaster Coordinating Council.
7. On-going purchase of 9 DRTEFS, 5 sets of Power Tools and 170 Sets of Rescue Tools.

THANK YOU VERY MUCH!

Participatory Urban Risk Management

Zubair Murshed

AUDMP



Urban Context and Challenges

- Lack of socio-environmental vision
- Growth-oriented development
- Fast-poorly planned urbanization
- Starved municipal authorities

Urban Vulnerabilities & Risks

- Urban Built Environment
- Concentration effect
  (people, financial, economic)
- Monstrous industries
- Non-existent communities

AUDMP Strategic Approach

- Strengthening Municipal Authorities
- Engaging multiple stakeholders
- Developing community capacities

AUDMP Process

- Risk Assessment & Scenario Building
- Risk Reduction Planning
- Implementing selected interventions
- Replicating

Policy, Legal & Institutional Arrangements

- Bangladesh: Activating Municipal Disaster Management Committees
- Sri Lanka: Integrating natural disaster mitigation in National Physical Planning Policy and National Land Use Policy
- Thailand: Strengthening capacity of NEW Department of Disaster Prevention and Preparedness

Risk Assessment

Mapping at city and community levels -
Simple techniques
Participatory approach

Capacity Building

Mix of informal hands-on
and formal training courses

Mitigation Measures

Community-based initiatives in Cambodia

Safer Construction in
Indonesia, Nepal, Sri Lanka, Vietnam

Improving infrastructure in
Bangladesh and Cambodia

Land-Use Planning in Sri Lanka

Safer Construction

Bengkulu, Indonesia

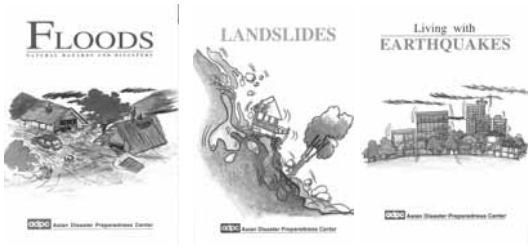
Notice boards and
demonstrations

Re-construction of Bhuwaneshwori School, Nepal with seismic reinforcements

Public Awareness

Brochures, Drills,
Exhibitions, Role
Plays, Posters, Radio
Talk shows, Rallies,
Soap Operas, Songs,
Television
T-shirts

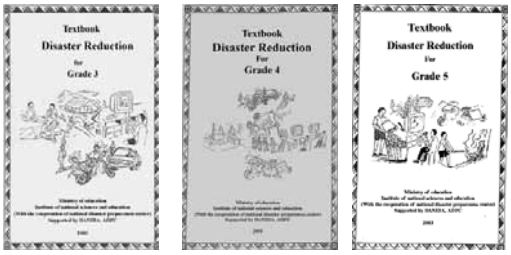
Public Awareness



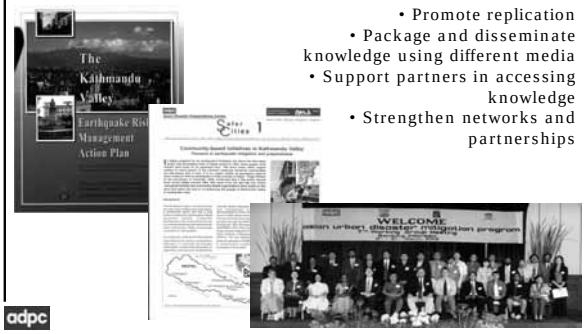
Brochures

Disaster Risk Education

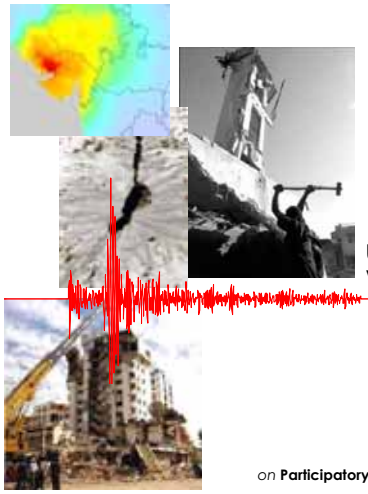
Integrated Disaster Risk Management and Public Safety in the Elementary Curriculum in Lao PDR.



Knowledge Networking



- Promote replication
- Package and disseminate knowledge using different media
- Support partners in accessing knowledge
- Strengthen networks and partnerships

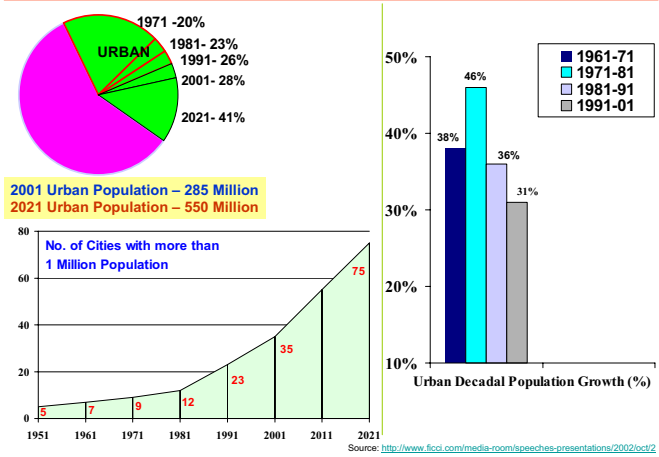


Urban **E**arthquake **V**ulnerability **R**eduction **P**roject **(UEVRP)**

G Padmanabhan
Emergency Analyst, UNDP India

Video Conference
on **Participatory Urban Risk Management**, 24th July 2006

INDIA:URBANISATION SCENARIO



Source: http://www.ficci.com/media-room/speeches-presentations/2002/oct/2

Higher losses of life and property in a given hazard intensity are due to:

- increasing urbanization, expansion of habitat into unsuitable vulnerable areas
- higher population densities
- vulnerable construction, non-engineered unsafe construction
- ageing buildings/infrastructure

VULNERABILITY of Housing Stock in the country
50% of our existing housing units consist of clay, adobe or stone walls and 35% have burnt brick walls – highly vulnerable to sustain damage of seismic intensities namely VII, VIII and IX

Urban Earthquake Vulnerability Reduction Project

Zone III – Ahmedabad, Vadodara, Rajkot, Bhavnagar, Surat, Mumbai, Bhiwandi, Nashik, Pune, Bhubaneswar, Cuttack, Asansol, Kolkata, Agra, Varanasi, Bareilly, Lucknow, Kanpur, Indore, Jabalpur, Vijayawada, Dhanbad, Chennai, Coimbatore, Mangalore, Kochi, Kozhikode, and Trivandrum.

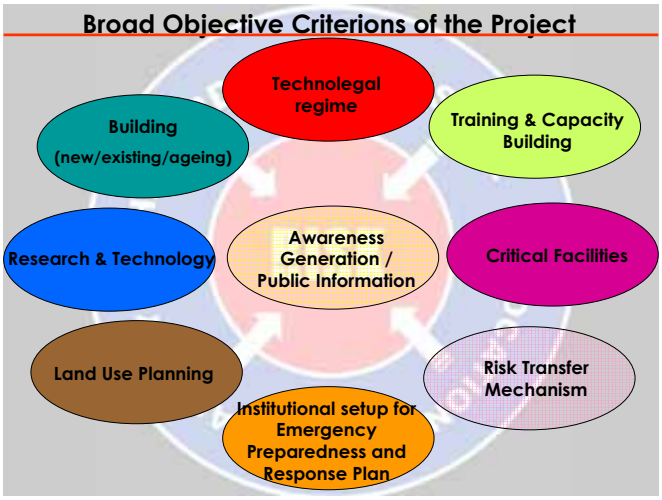
Zone IV – Dehradun, New Delhi, Jamnagar, Patna, Meerut, Jammu, Amritsar and Jalandhar.

Zone V – Guwahati and Srinagar.

The broad objectives of the project are as follows:

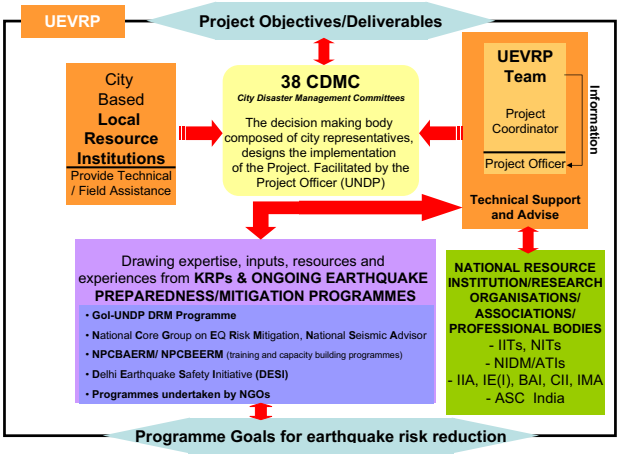
- Awareness generation
- Development of Preparedness and Response plans at the community and administrative levels
- Development of Techno-legal regime for the states.
- Training and Capacity building at all levels.
- Knowledge networking.

Broad Objective Criterions of the Project

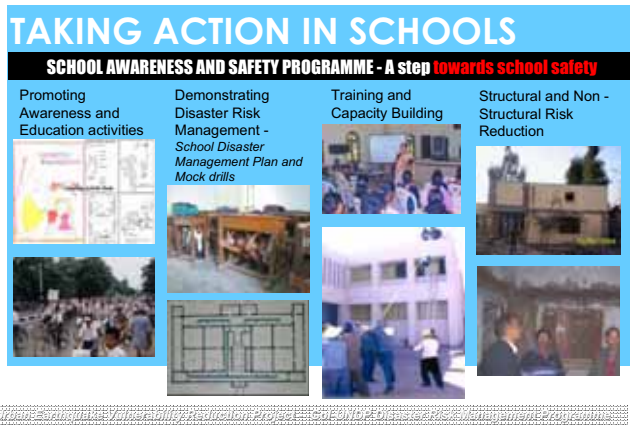


STAKEHOLDERS

Broad *IMPLEMENTATION MECHANISM / NETWORKING INTERFACE*

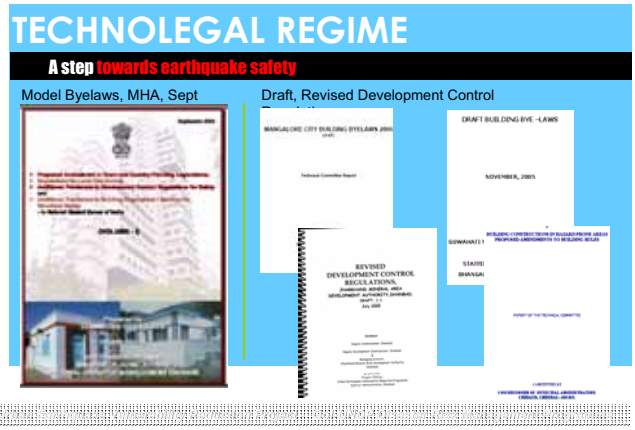


Key Achievements



Key Achievements

Key Achievements



Thank You

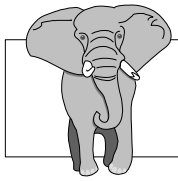
For more information, please visit www.undp.org.in/dmweb, www.ndmindia.nic.in

Urban Environmental Management

Hari Srinivas

Chief, Urban Environment Management Unit
United Nations Environment Programme
International Environmental Technology Centre

UNEP

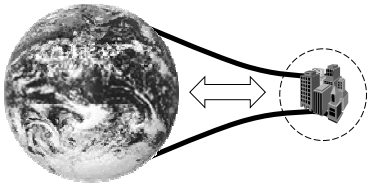


The Six Blind Men and the Urban Elephant

Urban environments are complex – there are so many interlinking issues, and different people understand it from different perspectives.

UNEP

Rethinking Urban Areas

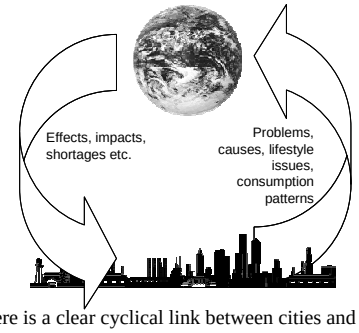


Causes and pressures of many global environmental problems can easily be traced back, directly or indirectly, to urban areas.

'urban activity' have far-reaching and long-term effects not only on its immediate boundaries, but also on the entire region in which it is positioned.

UNEP

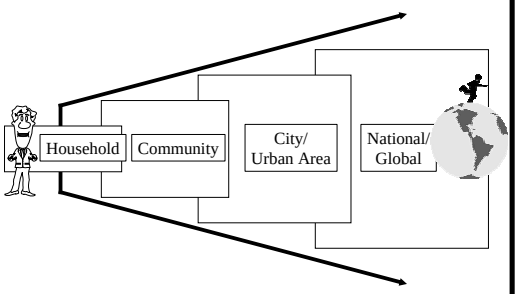
Cause and Effect Cycles



There is a clear cyclical link between cities and urban areas on one hand, and global environmental problems on the other …

UNEP

Understanding the Scale of Environmental Problems



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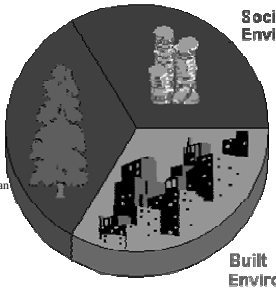
Need for a New Approach

How can we (re)define Cities?

There is a clear need for a new, comprehensive and holistic approach

UNEP

Environmental Dimensions of Urban Areas



Socio-economic Environment
Resources, processes and effects related to buildings, housing, roads, railways, electricity, water supply, gas etc.

Natural Environment
Resources, processes and effects related to flora and fauna, human beings, minerals, water, land, air, etc

Resources, processes and effects related to human activities, education, health, arts and culture, economic and business activities, heritage - urban lifestyles in general.

Built Environment

UNEP

Expanding Paradigms

The old paradigm of **'community participation'** has now expanded to include many new ones …

UNEP

E- Tools available to Local Governments

- World charter on local governments – *for increased capacity building and public administration changes*
- LCA and Eco-Labeling – *waste reduction and resource savings*
- EMS and ISO 14001 – *consumption and production changes*
- Urban planning rules and building codes – *energy savings, material conservation*
- Kyoto Protocol – *emissions reduction, air pollution*

UNEP

The need of the day …

Urban *Capacity Building*	**Urban *Governance***
Urban capacity building is a process that involves value added instruction, the training of trainers, activities with multiplier effects, and networking. It involves both institutional capacity-building, as well as human capacity-building.	Urban governance refers to the complex set of values, norms, processes, and institutions by which society manages its development and resolves conflict, formally and informally. It involves the state, but also the civil society.

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This is where

Environmental Management Systems (EMS)

comes in …

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Inspiration from ISO 14001

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The GET Matrix

	Governance	Education	Technology
Solid Waste			
Water			
Energy			
Transportation			
Housing			
…			

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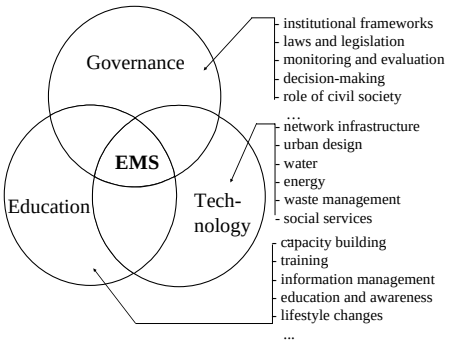
The "G.E.T. Urban" Formula



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Developing an EMS for Cities

Promotion of Eco-Office

Step 1
↓
Step 2
↓
Step 3

- Reduction of energy use
- Reduction of water use
- reduction of solid wastes
- Promotion of recycling
- green procurement
- conserving water and clean air
- appropriate control of chemicals

UNEP

Developing an EMS for Cities

Promotion of Eco-Projects

Step 1
↓
Step 2
↓
Step 3

- using e-friendly materials
- using e-friendly equipment
- accelerate use of recycled materials
- green public engineering works
- develop green technology
- promote greening

UNEP

Developing an EMS for Cities

Green City Planning

Step 1
↓
Step 2
↓
Step 3

- set 'green' guidelines for public works
- set 'green' guidelines for housing
- enhance public transportation
- capacity building
- apply EMS to the whole city

UNEP

The Environmental Challenge for Local Governments

- Use global trends to develop the local environment
- Partnerships need to be developed among all local actors
- Proactive knowledge transfer to local stakeholders
- In-depth and intensive scientific research for policy and project development

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Further information on UNEP-IETC and its activities/projects is available at:

http://www.unep.or.jp/

or

email: **ietc@unep.or.jp**

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Workshop modules

Module 1: *Risk Assessment* by Mr. Fumio Kaneko, OYO International

Module 2: *Action Planning* by Ms. Lorna Victoria, CDP

Module 3: *Decision Making* by Mr. Hidetomi Oi, JICA

Module 4: *Implementation Management* by Dr. Hari Srinivas, UNEP-IETC

Module 5: *Education for Sustainable Development* by Dr. Rajib Shaw, Kyoto University

Module 6: *Information Management* by Mr. Manu Gupta, SEEDS

Participatory Urban Risk Management
Action Workshop on Education for Sustainable Development

Module 1
- RISK ASSESSMENT

25 th July, 2006
(Morning of Day 3)

by
Fumio Kaneko, OYO International Corp.

1

Contents of Risk Assessment

- 1. Introduction
  - Objectives of this Programme, and Keywords
  - Fundamental Process of Disaster Management
  - 6 Modules of this Programme
- 2. Terminology relating to Risk Assessment
  - Hazard (Disaster), Risk (Loss),
  - Element at Risk (Exposure), Vulnerability, etc.
- 3. Tools for Risk Assessment
  - GESI, RADIUS, HAZUS
  - Trial of RADIUS Tool
  - Process of tools and principles behind
- 4. To be continued to Action Planning

2

Objectives of the Programme

1. To provide opportunities for participants coming from different fields and countries to share their experiences and knowledge on **SUSTAINABLE URBAN RISK MANAGEMENT** issues.
2. To develop information dissemination methodologies on **ASSESSMENT OF URBAN RISK**, proactive risk education, decision making for sustainable management, and urban eco communities,
3. To develop learning material and **DECISION-MAKING TOOLS** for sustainable urban management to be used by **LOCAL** government officials, development practitioners including NGOs, **LOCAL** decision-makers, and **LOCAL** community leaders

3

KEYWORDS from Programme's documents for Risk Assessment

- Main disaster is hydro-meteorological, that causes 97 percents of total people affected, and 60 per cents of the total economic losses.>**Natural Hazards**
- Developing action-oriented educational material and decision-making tool sets to be used locally by various stakeholders, especially in urban areas>

  > **Tools for supporting local urban**
- To promote the importance of appropriate risk management
  - Focusing on issues of urban risk management,
  - need for community participation, and a socio-economic issues,
  - emphasizing the importance of an environment friendly urban area
  - that will lead to a safe and secure society

Natural hazards (disasters)

- Avalanches
- Drought
- Earthquake
  - seismic ground motion
  - faults rupture
  - Ground settlements
- Snow/Rain Fall
- Flood
- Landslide
- Liquefaction
  - slope failure
  - mud flow
- Tsunami/Seiches
- Typhoon
  - Cyclone
  - Hurricane
- Volcano eruption
- Wind Storm
- Wild Fire
- Etc.

5

RISK ASSESSMENT for urban risk management

Purpose of this MODULE

To share a risk assessment example and to consider how to cope against natural hazard and social risk

- The assessment process are complex to understand as they involve multi-sectoral parameters.
- Many of the issues to be discussed are of technical nature, but this session requires focus on the principles behind the assessment process and not the technical details.
- Need to look at participatory assessment tools.

A proverb for Risk Management Process

RISK ASSESSMENT is
to know the ENEMY including local situation

"To know enemy
and to know your own,
consequently,
every fight should be won."

(after Sun, the famous Chinese ancient strategist)

7

Fundamental Process of Risk Management

To know risks for local urban **(ENEMY)**
To know capacity of coping against urban risks **(OWN)**
To consider measures /improvement of local Society **(STRATEGY)**
To act measures **(ACTION)**
To evaluate consequences **(CHECK)**
To improve and to circulate the process of measures **(DEVELOP: IMPROVE, SUSTAIN)**

8

Process of this programme and flow of disaster management

Modules	
(a) Risk Assessment	**to know weak points for urban risk** **to know hazards & risk at urban are** **to know your own strength & weakness (capacity)**
(b) Action Planning	to consider what & how to measure and cope against risks to consider measures and act against future risks to formulate plans how to cope against future risks
(c) Decision Making	to select plans and actions to decide what & how to act
(d) Implementation Managemen	to consider how to implement measures smoothly, effectively with less costs etc. to consider how to continue participation of composers of society
(e) Education for Sustainable Development	to consider how to continue actions with improvements to consider how to develop measures and how to continue
(f) Information & Communication Management	to consider how to communicate among the community/society and with outside to study how to storage archive useful information and how to disseminate them when necessary to necessary people

What is Risk Assessment

(a) Risk Assessment

to know hazards & risk at urban are

to know weak points for urban risk

to know your own capacity (strength & weakness)

10

What is risk?

- Hazard has not always affected societies
- But Risk (= consequences of hazard) and society itself have affected societies worse if society has less preparedness
- Risk = Hazards * (Elements * Vulnerability)
- Elements (at Risk) is exposure of assets
- Vulnerability is fragility (weakness) against Hazards

11

Examples of probability of an individual dying in any one year

Smoking 10 cigarettes a day	One in 200
All natural causes, age 40	One in 850
Any kind of violence of poisoning	One in 3,300
Influenza	One in 5,000
Accident on the road (driving in Europe)	One in 8,000
Leukemia	One in 12,500
Earthquake, living in Iran	**One in 23,000**
Playing field sports	One in 25,000
Accident at home	One in 26,000
Accident at Work	One in 43,500
Floods, living in Bangladesh	**One in 50,000**
Radiation working in radiation industry	One in 57,000
Homicide living in Europe	One in 100,000
Floods, living in Northern China	**One in 100,000**
Accident on railway (traveling in Europe)	One in 500,000
Earthquake, living in Japan	**One in 1,000,000**
Earthquake, living in California	**One in 2,000,000**
Hit by lightning	**One in 10,000,000**
Windstorm, Northern Europe	**One in 10,000,00**

12

Definition of Risk

- **Risk = Hazard** x **Element at Risk** x **Vulnerability**
- **Hazard:** A potentially damaging physical event, phenomenon and/or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.
- **Element at Risk:** the population, buildings and civil engineering works, economic activities, public services and infrastructure, etc. at risk in a given area.
- **Vulnerability:** the degree of loss to a given element at risk, or set of such elements, resulting from the occurrence of a natural phenomenon of a given magnitude and expressed on a scale from 0 (=no damage) to 1 (=total loss).
- **Risk:** the expected number of lives lost, persons injured, damage to property and disruption of economic activity due to a particular natural phenomenon, and consequently the product of specific risk and elements at risk. (after UNDRO)

13

Terms for Risk Assessment

- Hazard
- Natural Hazard
- Man-made Hazard
- Disaster
- Risk
- Loss
- Element at Risk
- Exposure
- Vulnerability
- Fragility
- Susceptibility
- Tool

- Hazard/Risk Assessment
- Hazard/Risk Analysis
- Hazard/Risk Management

There are various terminologies, due to purposes.

14

Risk Terminology 1

- **Risk**
  The probability of **harmful consequences**, or **expected losses** (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions. Conventionally risk is expressed by the relation Risk = Hazards x Vulnerability.
- Beyond expressing a possibility of physical harm, it is crucial to recognize that risks are inherent or can be created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes.
- **Risk assessment/analysis**
  A process to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.
- The process of conducting a risk assessment is based on a review of both the technical features of hazards such as their location, intensity, frequency and probability; and also the analysis of the physical, social, economic and environmental dimensions of vulnerability, while taking particular account of the coping capabilities pertinent to the risk scenarios.

Risk Terminology 2

- **Risk:**
  the objective (mathematical) or subjective (inductive) probability that the hazard will become an event. Factors (risk factors) can be identified that modify this probability. Such risk factors are constituted by personal behaviors, life-styles, cultures, environmental factors, and inherited characteristics that are known to be associated with health-related questions.
- *__Risk:__
  the probability of loss to the elements at risk as the result of the occurrence, physical and societal consequences of a natural or technological hazard, and the mitigation and preparedness measures in place in the community.
- •__Risk__
  the expected number of lives lost, persons injured, damage to property and disruption of economic activity due to a particular natural phenomenon, and consequently the product of specific risk and elements at risk. - UNDRO.
  Compare to or see elements at risk, hazard, natural hazard, vulnerability.

16

How to determine Risks?

Three essential components to be quantified separately in the determination of Risk.

a) Hazard occurrence probability: the **likelihood** of experiencing any natural hazard at a **location** or in a region with its **magnitude**

b) Elements at Risk: identifying and making an inventory of **people or buildings** or other elements which would be affected by occurrence of a hazard and estimating their **economic value**

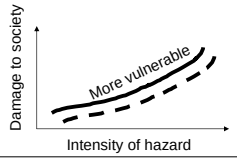
c) Vulnerability of elements at risk: how damaged the buildings or people or other elements would be if they experienced some **level of hazard**

17

How to Assess Risk?

- It is well said that we cannot reduce Hazard (example: occurrence of earthquakes)
- First to check history (experience) and specify hazard
- Locally hazards are specific usually
- But we can reduce Risks through improvement of Elements and Vulnerability.
- Elements * Vulnerability is the key to improve Exposure
- Sometimes, more convenient is more vulnerable

• Example of vulnerability



Hazard Evaluation (which factors to be examined)

To perform risk assessment, need to know the **probability of occurrence of a hazard** of a certain level of severity, within a specific period of time, in a given area. Severity: magnitude of hazard, effect site

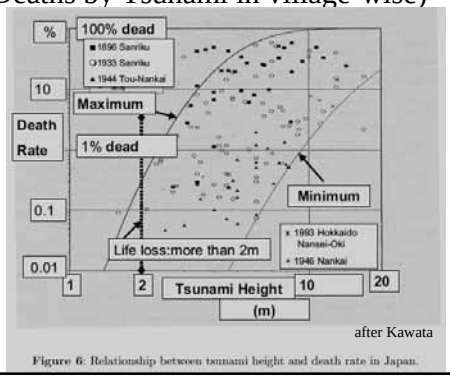
Natural Hazards	Event parameters	Site parameters
Drought	Affected Area(km²)	Rainfall Access to water
Earthquake	Magnitude	Seismic intensity, PGA (gal) Soft soils
Flood	Flooded Area(km²) Volume of water(m³)	Depth of flood water (m) Altitudes of land
Landslide	Volume of dislocated material(m³)	Potential for ground failure Location of houses, roads
Strong Winds	Wind velocity (km/h) , affected area(km²)	Wind Velocity (km/h) Strength of roofs
Tsunami	Tsunami Height (m),	Depth of inundation (m) Height of land & structures
Volcano	Eruption size and duration	Potential of ash coverage (m), lava, dust fallout, debris flow

Principal Elements Vulnerable to Specific Hazards

Natural Hazards	Principal vulnerable elements	
	tangible	intangible
Drought	Crops & livestock, agricultural livelihoods, people's health	Disruption of population, destruction of the environment, culture losses
Earthquake	Weak buildings & their contents, occupants, Machinery/equipments, infrastructure, livestock,	Social cohesion, community structures, cohesion, cultural artifacts
Flood/Tsunami	Crops, livestock, machinery/equipment, infrastructure, weak buildings (in flood plains, coastal area)	Social cohesion, community structures, cohesion, cultural artifacts
Land Instability	Roads, infrastructure, buildings (on /at base of slopes/cliffs)	Social cohesion, community structures, cohesion, cultural artifacts
Strong Winds	Lightweight buildings & roofs, fences, trees, signs, boats, fishing and coastal industries	Social cohesion, community structures, cohesion, cultural artifacts
Volcano Eruption	Crops, livestock, people, roofs, water supply, (Close to volcano)	Social cohesion, community structures, cohesion, cultural artifacts

after Coburn 20

Example of Vulnerability (Deaths by Tsunami in village-wise)



after Kawata

Figure 6: Relationship between tsunami height and death rate in Japan.

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Loss (Risk) Parameters for Risk Assessment

Consequences	Scale Factors	Losses	
		tangible	intangible
Physical Damage	Inventory of damaged elements, by number and damaged level	Replacement and repair cost	Cultural losses
Deaths	Number of people	Loss of economically active individuals	Social and psychological effects on remaining community
Injuries	Number and injury severity	Medical treatment: needs, temporary loss of economic activity by productive individuals	social and psychological pain and recovery
Emergency operations	Volume of manpower, man-days, employed, equipment, and resources spent for relief	Mobilization costs. Investment in preparedness capability	Stress and overwork in relief participants
Disruption to economy	Number of working days lost, volume of production lost	Value of production loss	Opportunities competitiveness reputation
Social disruption	Number of displaced people, homeless	Temporary housing relief economic production	Psychological, social contracts, cohesion, community morale
Environmental impact	Scale and severity	Clean-up costs, repair cost	Consequences of poorer environment, health risks, risk of future disaster

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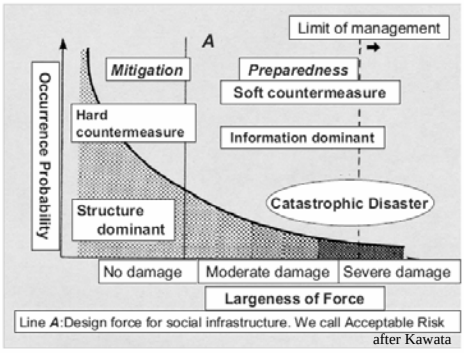
Risk Management Concept for Disaster countermeasure in Japan



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Risk Assessment Earthquake as an example

ENEMY=**Hazard** =Earthquake:
Source: Magnitude, location (distance), probability of occurrence
Hazard is severity of seismic ground motion (PGA, MMI)
Vulnerability: soil softness, thickness
Element at Risk: number (distribution) of buildings, population etc.
Risk: Direct: damage to building, lifeline facilities, casualties,
Indirect: functional suspension, psychological impact
Economical loss for damage, recovery, suspension of industrial, commercial activities

Social Risk source: some measures can be considered, but natural one especially earthquake etc. cannot be eliminated,
only some forecasting from historical events and observations

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Collateral Hazards following earthquakes

- Effects caused by earthquakes: collateral hazards
- Liquefaction, landslide, uplift & subsidence of the ground following earthquakes
- Tsunami: tidal waves which cause wave height, inundation & run-up

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Seismic Risk Analysis (Assessment)

- Macro Seismic Hazard Analysis
  - Deterministic DSHA
  - Probabilistic PSHA
- Micro Seismic Hazard (Site effects) Analysis
  - Soft ground effects analysis
  - Liquefaction analysis
- Vulnerability and Risk (loss) Analysis
  - Building vulnerability by vulnerability curves
  - GESI, RADIUS, HAZUS approaches
  - Case Studies

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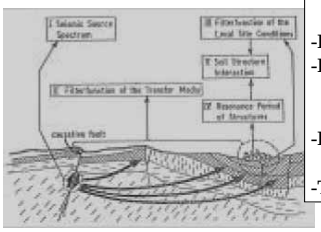
Site Effects

Site Effects
-Soft ground effects
-Liquefaction
-Topographical effects



The amount of amplification depends on
-Soil thickness
-Soil characteristics (stiffness/softness)
-Earthquake types
-Largest amplification occurs when soil resonant to seismic motion
-Liquefaction is a kind of soil failure
-Topographic character

after Coburn

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Methods for earthquake risk (loss) estimation

- Freely available software:
- **GESI:** Global Earthquake Safety Initiative (by GHI)
- **RADIUS:** Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters (by IDNDR)
- **HAZUS** method in United States:
  - Federal Emergency Management Agency (FEMA)
  - National Institute for Building Science (NIBR)
- Other methods exist
  - For example, insurance companies

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GESI: Global Earthquake Safety Initiative

Simplest evaluation method for loss estimation for a total city

- Express urban earthquake risk in lay terms
- Measure trends in the urban earthquake risk of the **world's major cities**
- Evaluate the effectiveness of various means of reducing earthquake casualties
- Highlight the increasing earthquake **risk of schools** of developing countries and the potential for reducing that risk

Analyze risk management potential for the city and schools

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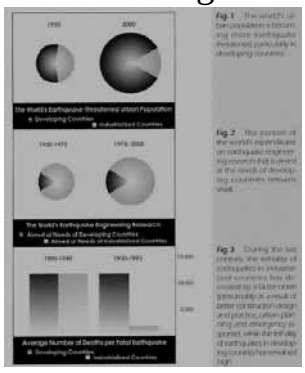
Background of GESI



Population increases, especially urban population

Engineering research mainly focuses on industrial countries

Lethality in industrial countries decrease , but remains in developing countries

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GESI method (2001)

developed from EDRI (Earthquake Disaster Risk Index by R. Davidson, 1997)

Project	Earthquake Disaster Risk Index (EDRI)	UN- Understanding Urban Seismic Risk Around the World (UNURAW)	GHI Method	Global Earthquake Safety Initiative (GESI)
Method	Earthquake Disaster Risk Index (EDRI)		GHI Method	
Objectives	Research and Development	Test	Research and Development	Test
Time Frame	1994- 1997	1998- 1999	1999- 2000	2000- 2001
Definition of Risk	Earthquake 'Disaster'		Earthquake Lethality	
Basis of Method	Composite Index		Loss Estimation	
Mode of Data Collection	Library	Email Questionnaire	Library	Interviews in Cities
Number of Cities Participating	10 Cities	20 Cities	10 Cities	21 Cities

Development and Implementation of the EDRI and GHI Method

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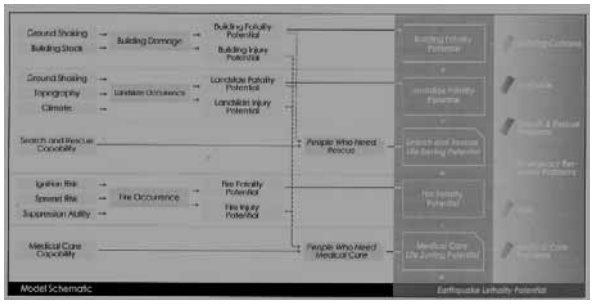
Process of GESI



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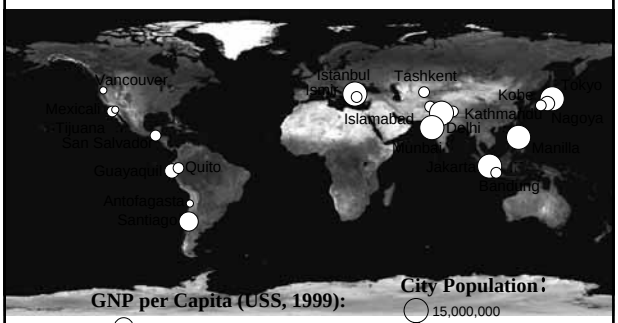
The GESI Cities



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Schedule of GESI

It takes time, and needs experts judgments, originally. Now simple software exists using average parameters.

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GESI STEPS (1)

Step No.	Theme
1	Measure ground shaking
2	Measure the amount of soft soil in the city
3	Measure building attributes
4	Convert building information into damage states
5	Convert building damage into the number of casualties caused by building collapse
6	Measure other natural feature relevant to landslide and fire
7	Measure other anthropogenic factors relevant to landslide and fire
8	Convert landslide data into landslide affected area
9	Convert landslide-affected area into deaths and injuries due to landslides
10	Measure search and rescue capacity
11	Convert search and rescue data into search and rescue life-saving potential
12	Convert fire data into severity of fire threat
13	Measure fire suppression capability

GESI STEPS (2)

Step No.	Theme
14	Convert fire data into deaths and injuries due to fire
15	Measure emergency medical capacity
16	Convert medical capability into effect of medical care
17	Combine results
18	Calculate the Emergency Response contribution to city risk
19	Calculate the Medical Care contribution to city risk
20	Calculate the Search and Rescue contribution to city risk
21	Calculate the Building Collapse contribution to city risk
22	Calculate the Landslide contribution to city risk
23	Calculate the Fire contribution to city risk
24	Combine all the source of Risk
25	Repeat analysis for schools
26	Analyze risk management potential

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Things Not Included for GESI

Infrastructure (Non-Building) Deaths
Earthquakes can cause deaths not only when buildings collapse but also when non-building infrastructure such as freeway bridges collapse. In recent California earthquakes, total fatalities have been light, and infrastructure deaths have made up a significant percentage of total deaths. However, such non-building deaths seem to become insignificant as casualty totals mount.

Liquefaction
Liquefaction, a phenomenon in which saturated ground loses strength or stiffness when shaken, has caused immense economic loss in many earthquakes. Buildings located on liquefiable soils can settle or tip when exposed to shaking. Underground infrastructure may "float" to the surface. While expensive, such consequences have not caused many deaths in past earthquakes (Durkin and Thiel, p. 295). Therefore, liquefaction is not included in our method.

Tsunami
Not all coastal communities with earthquake risk have a significant risk of experiencing locally generated tsunamis. Estimating the expected casualties from tsunamis is difficult because casualties depend on the size of the tsunami, the local topography, the orientation of the coast relative to distant seismogenic areas of the world, the population density, the warning time, etc.

Hazardous Materials Release
In theory, hazardous materials released during an earthquake could cause many deaths, especially if the material released were poisonous or flammable. To date there have been no major hazardous materials releases associated with earthquakes. This concept is currently excluded from the GHI model because of the difficulty of collecting information.

Dam Collapse
Some important cities are located downstream from vulnerable dams. The failure of such a dam could cause many deaths. However, including this concept would require collecting reliable information about a single structure, which does not seem possible to us at this time.

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Earthquake Lethality to Expected Life Loss to Cities by GESI

Qualitative judgment

Table: Earthquake Lethality to Expected Life Loss

Very Low	There is a 1 in 10 chance that **fewer than one hundred casualties** will occur in the city due to earthquakes during the next 50 years.
Low	There is a 1 in 10 chance that **hundreds of casualties** will occur in the city due to earthquakes during the next 50 years.
Moderate	There is a 1 in 10 chance that **hundreds to low thousands of casualties** will occur in the city due to earthquakes during the next 50 years.
High	There is a 1 in 10 chance that **thousands of casualties** will occur in the city due to earthquakes during the next 50 years.
Very High	There is a 1 in 10 chance that **thousands to tens of thousands of casualties** will occur in the city due to earthquakes during the next 50 years.
Extremely High	There is a 1 in 10 chance that **tens of thousands or more casualties** will occur in the city due to earthquakes during the next 50 years.

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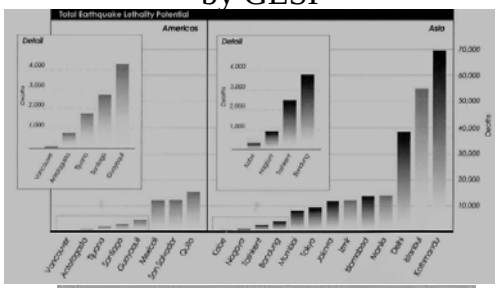
Total Earthquake Lethality Potential by GESI



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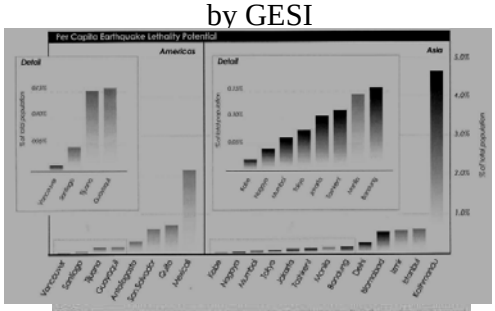
Per Capita Earthquake Lethality Potential by GESI



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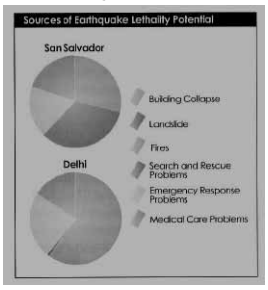
Sources of Earthquake Lethality Potential by GESI



Effectiveness of Mitigation Options By GESI

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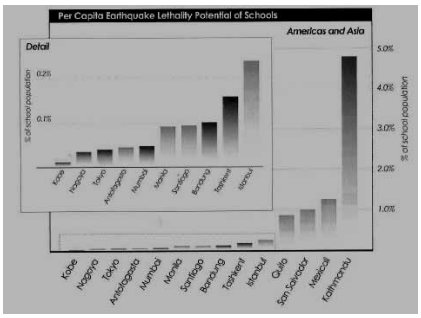
Per Capta earthquake Lethality Potential of Schools by GESI



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HAZUS Methodology

Most comprehensive loss estimation method which is publicly available
Runs on ArcGIS
Requires large amount of data
Made specifically for United States, but can apply another area such as Dehradun

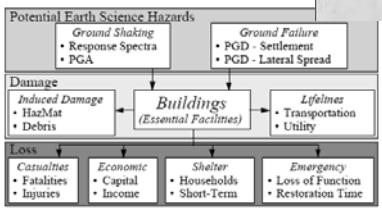
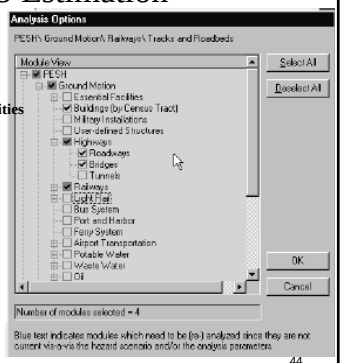


Figure 2.1. Building-Related Modules of the FEMA/NIBS Methodology

HAZUS Estimation

Ground Motion
Ground Failure
Direct Physical Damage
General Building Stock
Essential & High potential loss facilities
Lifelines & Transportation systems
Lifeline utility systems
Induced Physical Damage
Direct Economical/Social Losses
Inundation
Fire
HazMat (hazardous materials)
Debris
Casualties
Shelter
Economic
Indirect economic losses



Comparison HAZUS & RADIUS

HAZUS	**RADIUS**
-Detailed approach	-First approach
-Response spectra	-Works with PGA
-Frequency related acceleration values	-No Frequency related acceleration values
-Detailed building characterization	-Very simple building characterization
-Requires very detailed data	-Requires limited data
-Implemented for ArcView & Mapinfo GIS	-Simple Excel program or GIS
-Only for United States	-Applicable world wide

RADIUS Tool Direction

Quantitative approach

- It is a **simple-to-use** earthquake damage estimation tool for use by city administrators, who want to have an idea of the property damage and human life loss to a city, if a big earthquake, like the 1995 Kobe earthquake, were to strike a city.
- The tool takes into account that **city administrators** are likely to have only a vague idea of the seismic susceptibility of a city.
- In view of this limitation, the user is expected to enter generic information on demographics, relative density of buildings, soil type, and inventory information related to buildings and lifeline facilities.
- The tool aims to be practical, mainly for promoting awareness of earthquake damage and risk assessment.
- It is not to be used for accurate engineering analysis.

Tutorial tool

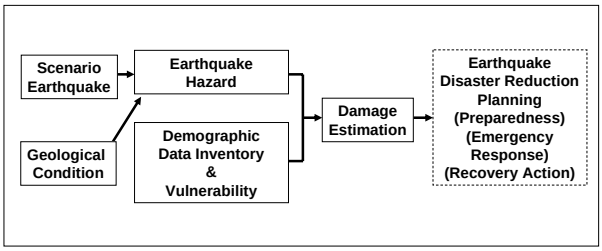
RADIUS Tool Objectives

- to facilitate preliminary estimation of earthquake damage
- in developing countries
- by city administrators and the general public,
- but not by professionals,
- and to raise awareness of earthquake risks in cities all over the world.

RADIUS Tool Characteristics

- designed to run on Excel 97 (no interests from Microsoft)
- After entry of basic data, the user can obtain preliminary results
- that help to understand what is an earthquake disaster and how vulnerable a city is.
- Applicable to all over the world,
- and even virtual area

RADIUS Tool
General flow of
earthquake damage estimation



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RADIUS Methodology

- **Step 1: Defining scenario earthquake**
- **Step 2: Calculate the attenuation**
- **Step 3: Calculate soil amplification**
- **Step 4: Convert PGA to MMI**
- **Step 5: Apply vulnerability function for building types**
- **Step 6: Apply vulnerability function for Infrastructure types**
- **Step 7: Apply Vulnerability function for Casualties**
- ---
- Step 8: Apply cost information to the buildings and combine with vulnerability to calculate losses for different return periods
- Step 9: Combine loss information for different return periods and calculate the risk by adding up the losses from these periods
- Step 10: Combine information and make summary

after Coburn

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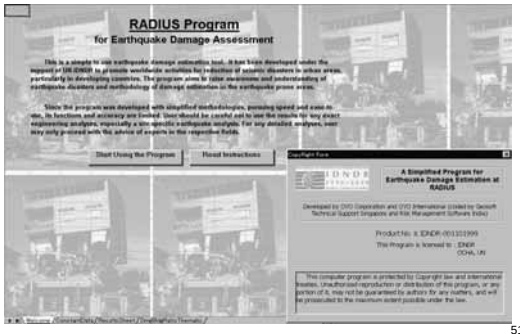
RADIUS Tool
Opening/welcome screen



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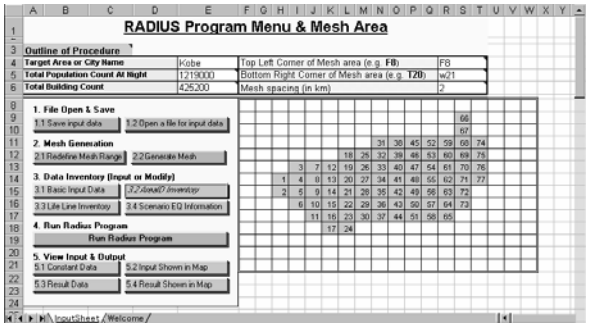
RADIUS Tool
Main menu screen



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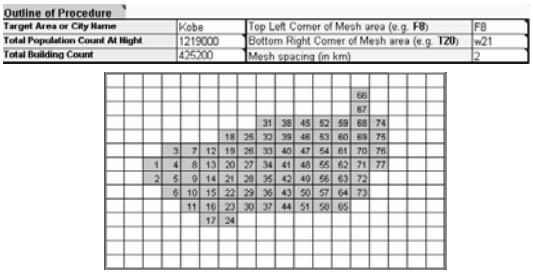
RADIUS Tool
Target region definition screen
& Meshed area screen



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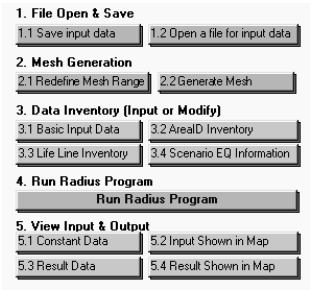
RADIUS Tool
Functions menu screen



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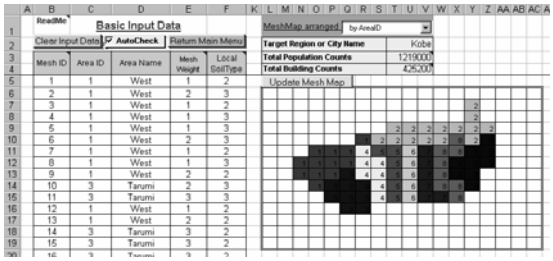
RADIUS Tool
Basic data input screen



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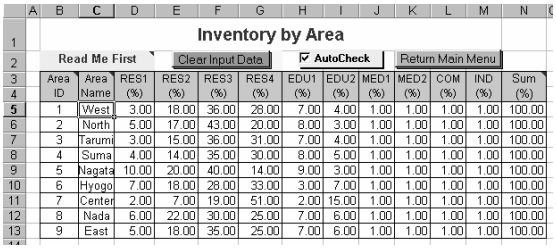
RADIUS Tool
Area ID inventory screen



Area ID	Area Name	RES1 (%)	RES2 (%)	RES3 (%)	RES4 (%)	EDU1 (%)	EDU2 (%)	MED1 (%)	MED2 (%)	COM (%)	IND (%)	Sum (%)
1	West	3.00	18.00	36.00	28.00	7.00	4.00	1.00	1.00	1.00	1.00	100.00
2	North	5.00	17.00	43.00	20.00	8.00	3.00	1.00	1.00	1.00	1.00	100.00
3	Tarumi	3.00	15.00	36.00	31.00	7.00	4.00	1.00	1.00	1.00	1.00	100.00
4	Suma	4.00	14.00	35.00	30.00	8.00	5.00	1.00	1.00	1.00	1.00	100.00
5	Nagata	10.00	20.00	40.00	14.00	9.00	3.00	1.00	1.00	1.00	1.00	100.00
6	Hyogo	7.00	18.00	28.00	33.00	3.00	7.00	1.00	1.00	1.00	1.00	100.00
7	Center	2.00	7.00	19.00	51.00	2.00	15.00	1.00	1.00	1.00	1.00	100.00
8	Nada	6.00	22.00	30.00	25.00	7.00	6.00	1.00	1.00	1.00	1.00	100.00
9	East	5.00	18.00	35.00	25.00	7.00	6.00	1.00	1.00	1.00	1.00	100.00

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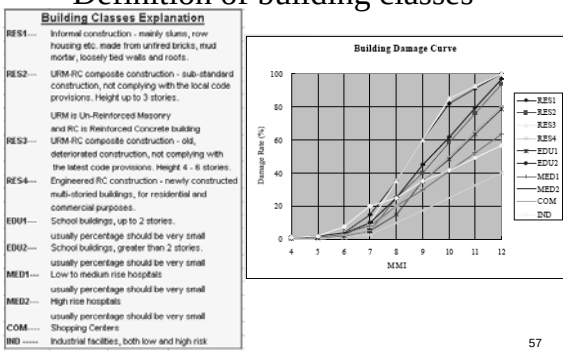
RADIUS Tool
Definition of building classes



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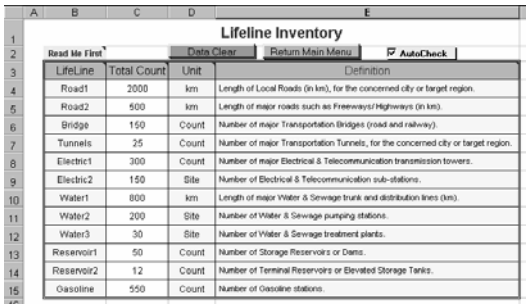
RADIUS Tool
Lifeline inventory screen



LifeLine	Total Count	Unit	Definition
Road1	2000	km	Length of Local Roads (in km), for the concerned city or target region.
Road2	500	km	Length of major roads such as Freeways/ Highways (in km).
Bridge	150	Count	Number of major Transportation Bridges (road and railway).
Tunnels	25	Count	Number of major Transportation Tunnels, for the concerned city or target region.
Electric1	300	Count	Number of major Electrical & Telecommunication transmission towers.
Electric2	150	Site	Number of Electrical & Telecommunication sub-stations.
Water1	800	km	Length of major Water & Sewage trunk and distribution lines (km).
Water2	200	Site	Number of Water & Sewage pumping stations.
Water3	30	Site	Number of Water & Sewage treatment plants.
Reservoir1	50	Count	Number of Storage Reservoirs or Dams.
Reservoir2	12	Count	Number of Terminal Reservoirs or Elevated Storage Tanks.
Gasoline	550	Count	Number of Gasoline stations.

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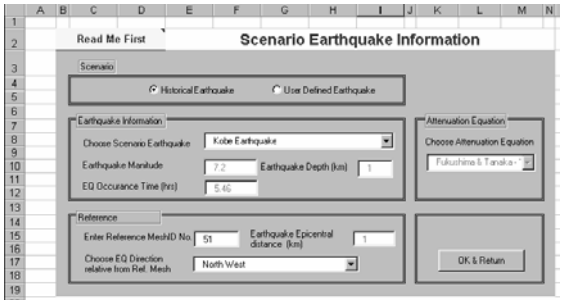
RADIUS Tool
Scenario earthquake inventory screen



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RADIUS Tool
Historical earthquake parameters

Table 1 --- Historical EQ Parameters

ID	Earthquake Name	Country	Year	Magnitude	City	Epicentral distance(km	Depth (km)	Time	Attenuation Function	Hypocentral distance (km)
1	Tangshan Earthquake	China	1976	8.2	Tangshan	0	0	3.14	Joyner & Boore - 1981	0
2	El Asnam Earthquake	Argeria	1980	7.1	El Asnam	7	0	12.25	Joyner & Boore - 1981	7
3	Spitak earthquake	Armenia	1988	6.8	Spitak	0	0	11.41	Joyner & Boore - 1981	0
4	Luzon Earthquake	Philippine	1990	7.8	Baguio	40	0	16.26	Campbell - 1981	40
5	Manjil Earthquake	Iran	1990	7.6	Manjil	5	0	1.30	Joyner & Boore - 1981	5
6	Northridge Earthquake	USA	1994	6.7	Los Angeles	10	5	4.23	Joyner & Boore - 1981	11
7	Kobe Earthquake	Japan	1995	7.2	Kobe	1	1	5.46	Fukushima & Tanaka - 19	1
8	Kocaeli Earthquake	Turkey	1999	7.4	Golcuk	0	0	3.62	Joyner & Boore - 1981	0
9	ChiChi Earthquake	China/Taiwan	1999	7.7	Nantou	2	1	1.47	Joyner & Boore - 1981	2

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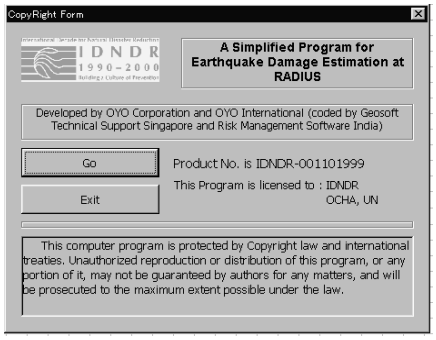
RADIUS Tool
"Run" screen



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RADIUS Tool
Constant data screen (1) & (2)

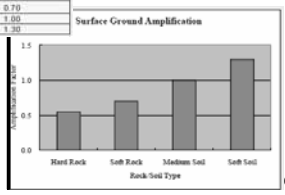
(1): Mesh weight and soil type

Table 1 --- Mesh Weight

Code	Description	Rate
0	NONE	0.0
1	LOW	0.5
2	AVERAGE	1.0
3	HIGH	1.5
4	VERY HIGH	3.0

Table 2 --- Soil Type

Code	Description	Amplification Factor
0	Unknown	1.00
1	Hard Rock	0.55
2	Soft Rock	0.70
3	Medium Soil	1.00
4	Soft Soil	1.30



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RADIUS Tool
Constant data screen (2) & (3)

(2): Attenuation and MMI-PGA conversion

Table 3 --- Attenuation Equations

AttnID	Source	Attenuation Equation
1	Joyner & Boore - 1981	PGA=10^(0.249*M-Log(D)-0.00255*D-1.02, D=(E^2+7.3^2)^0.5
2	Campbell - 1981	PGA=0.0195*EXP(1.26*M)*D^(-1.75), D=E+0.147*EXP(0.732*M)
3	Fukushima & Tanaka - 1990	PGA=(10^(0.41*M - LOG10 (R + 0.032 * 10^(0.41*M)) - 0.0034*R + 1.30))/980

Note: E---Epicentral distance R---Hypocentral distance

The MMI will be calculated by the formula:
log(PGA*980)=0.30*MMI+0.014
or MMI=1/0.3*(log10(PGA*980)-0.014)
by Trifunac & Brady (1975). PGA unit is G.

(3): Vulnerabilities of lifeline facilities

Table 12 --- LifeLine Damage Curve Data (%)

MMI	Road1	Road2	Bridge	Tunnels	Electric1	Electric2	Water1	Water2	Water3	Reservoir1	Reservoir2	Gasoline
4	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00
5	0.01	0.01	0.03	0.01	0.01	0.20	0.01	0.30	0.15	0.10	0.00	0.01
6	0.25	0.03	0.49	0.02	0.03	4.93	0.03	2.95	1.09	1.10	0.04	0.60
7	1.95	1.29	4.35	0.04	1.39	10.10	0.69	5.85	3.33	4.10	1.52	8.00
8	5.39	3.00	9.37	1.76	2.62	20.37	2.00	11.73	6.67	6.45	4.50	20.00
9	13.65	6.00	27.23	3.81	4.71	33.75	5.21	20.74	13.38	10.63	9.00	32.00
10	22.12	11.05	50.60	6.43	9.07	44.22	9.13	30.77	20.59	24.11	20.65	40.00
11	28.00	13.60	60.00	8.00	11.00	53.00	12.00	37.00	24.00	32.00	27.00	47.00
12	30.00	15.00	70.00	9.00	12.00	60.00	15.00	40.00	28.00	35.00	30.00	50.00

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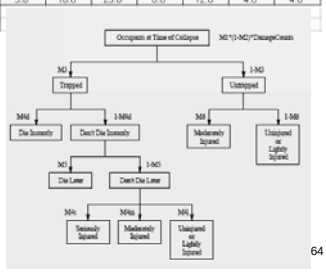
RADIUS Tool
Constant data screen (4)

(4): Night/Day ratio & occurrence time band

Table 13 --- Habitant Parameter for Day/Night difference (Night of RES1 & 2 are 1.0)

	RES1	RES2	RES3	RES4	EDU1	EDU2	MED1	MED2	COM	IND
Night	1.0	1.0	4.0	10.0	0.2	0.2	2.0	4.0	0.2	0.2
Day	0.5	0.5	2.0	5.0	10.0	25.0	6.0	12.0	4.0	4.0
Night Time Definition (hrs)			18.00	6.00						
Day Time Definition (hrs)			6.00	18.00						



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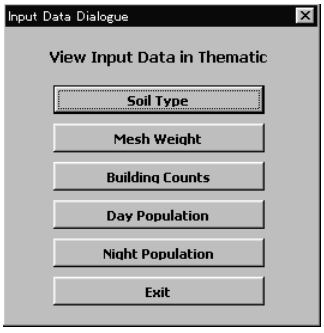
RADIUS Tool
View input data



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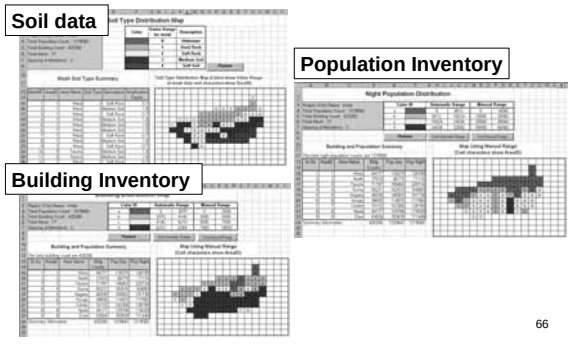
RADIUS Tool
Input Data Distribution Map Screen



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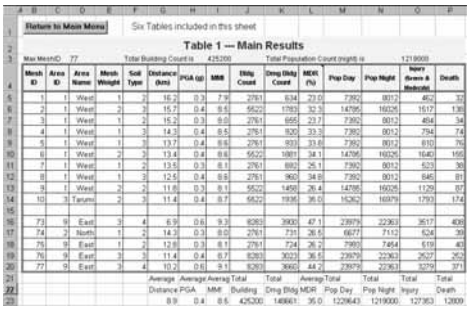
RADIUS Tool
Main Result Sheet screen



Return to Main Menu | Six Tables included in this sheet

Table 1 --- Main Results

Max MeshID: 77 | Total Building Count is: 425200 | Total Population Count (night) is: 1219000

Mesh ID	Area ID	Area Name	Mesh Weight	Soil Type	Distance (km)	PGA (g)	MMI	Bldg Count	Dmg Bldg Count	MDR (%)	Pop Day	Pop Night	Injury (Severe & Medical)	Death
1	1	West	1	3	16.2	0.3	7.9	2761	634	23.0	7392	8012	462	32
2	1	West	2	3	15.7	0.4	8.5	5522	1783	32.3	14795	16026	1517	138
3	1	West	1	2	15.2	0.3	8.0	2761	655	23.7	7392	8012	464	34
4	1	West	1	3	14.3	0.4	8.5	2761	920	33.3	7392	8012	794	74
5	1	West	1	3	13.7	0.4	8.6	2761	933	33.8	7392	8012	810	76
6	1	West	2	3	13.4	0.4	8.6	5522	1881	34.1	14795	16026	1640	155
7	1	West	1	2	13.5	0.3	8.1	2761	692	25.1	7392	8012	523	38
8	1	West	1	3	12.5	0.4	8.6	2761	960	34.8	7392	8012	846	81
9	1	West	2	2	11.8	0.3	8.1	5522	1458	26.4	14795	16026	1129	87
10	3	Tarumi	2	3	11.4	0.4	8.7	5522	1936	35.0	15262	16979	1793	174
73	9	East	3	4	6.9	0.6	9.3	8283	3900	47.1	23979	22363	3517	409
74	2	North	1	2	14.2	0.3	8.0	2761	731	26.5	6677	7112	624	39
75	9	East	1	2	12.8	0.3	8.1	2761	724	26.2	7993	7454	619	40
76	9	East	3	3	11.4	0.4	8.7	8283	3023	36.5	23979	22363	2627	252
77	9	East	3	4	10.2	0.6	9.1	8283	3660	44.2	23979	22363	3279	371
					Average Distance	Average PGA	Average MMI	Total Building	Total Dmg Bldg	Average MDR	Total Pop Day	Total Pop Night	Total Injury	Total Death
					8.9	0.4	8.6	425200	149661	35.0	1229643	1219000	127353	12809

RADIUS Tool
Life Line Result Screen

Table 2 --- LifeLine Inventory and Damage

Earthquake Time is 5.46

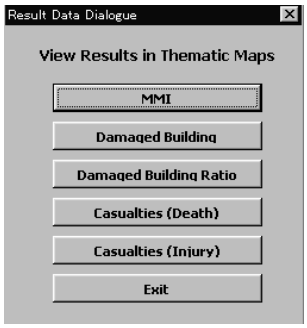
LifeLine	Note	Total Count	Damage Number	Unit	Damage Ratio (%)
Road1	Length of Local Roads (in km)	2000	189.8	km	9.5
Road2	Length of major roads such as Freeways/ Highways (in km)	500	22.7	km	4.5
Bridge	Number of major Transportation Bridges (road and railway)	150	28.1	Count	18.7
Tunnels	Number of major Transportation Tunnels	25	0.7	Count	2.8
Electric1	Number of major Electrical & Telecommunication transmission t	300	11.4	Count	3.8
Electric2	Number of Electrical & Telecommunication sub-stations	150	40.1	Site	26.7
Water1	Length of major Water & Sewage trunk and distribution lines (km	900	29.2	km	3.6
Water2	Number of Water & Sewage pumping stations	200	32.5	Site	16.2
Water3	Number of Water & Sewage treatment plants	30	3.0	Site	10.0
Reservoir	Number of Storage Reservoirs or Dams	50	4.5	Count	9.1
Reservoir	Number of Terminal Reservoirs or Elevated Storage Tanks	12	0.9	Count	7.2
Gasoline	Number of Gasoline stations	550	140.5	Count	25.5

EQ Name is Kobe Earthquake

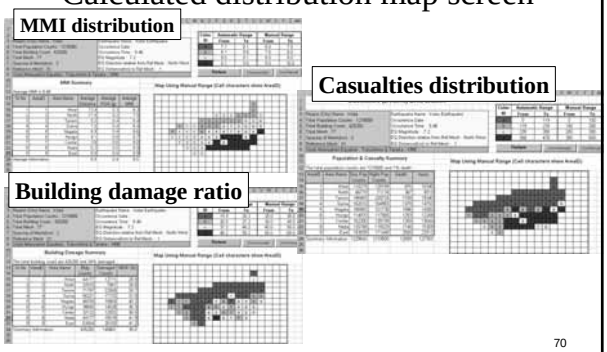
EQ Magnitude is 7.2

Earthquake Time is 5.46

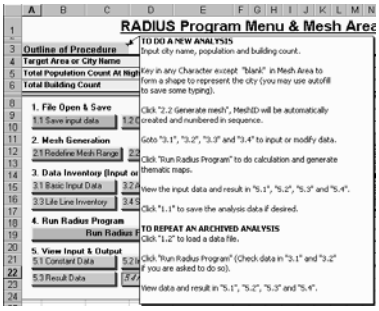
RADIUS Tool
Result data dialogue



RADIUS Tool
Calculated distribution map screen



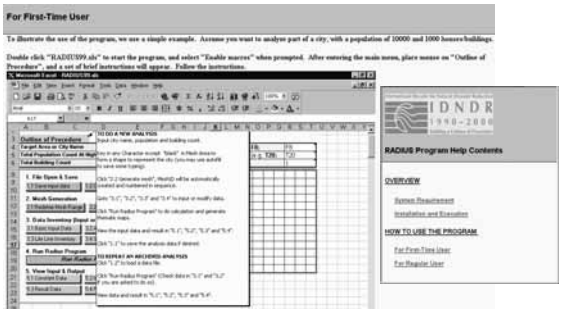
RADIUS Tool
An example of "Online help"



RADIUS Tool
Contents of "Online Help"

- General
- Definition of the target city and mesh generation
- Basic input data
- Building inventory data
- Lifeline data
- Scenario earthquake selection
- Run RADIUS and view results

RADIUS Tool
Instruction for first-time user



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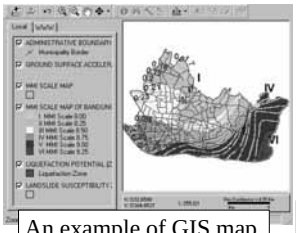
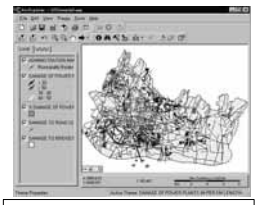
RADIUS Tool
GIS Example using "Arc Explorer"



An example of GIS map for MMI distribution with PGA contours (Bandung Municipality)



An example of GIS map for lifeline damage distribution map (Bandung Municipality)

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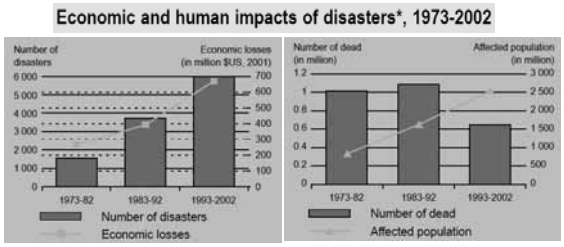
Economic Loss & Human Impacts



Source: EM-DAT: The OFDA/CRED International Disaster Database – WWW.em-dat.net – Universite Catholique de Louvain – Brusseles – Belgium, 2004

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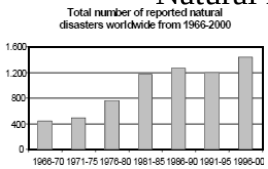
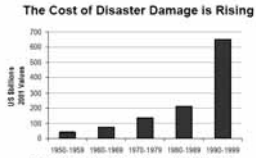
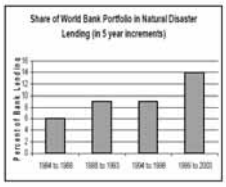
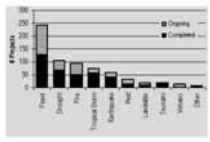
Various Efforts to Improve Society to Natural Disasters









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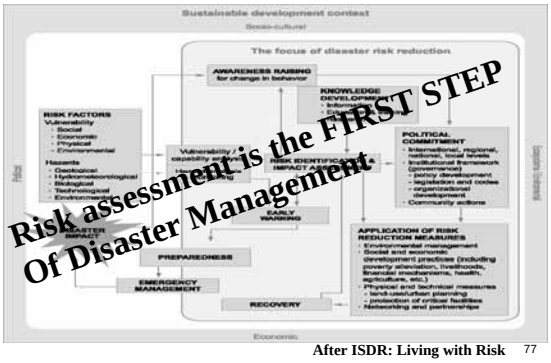
Sustainable Development Context



After ISDR: Living with Risk

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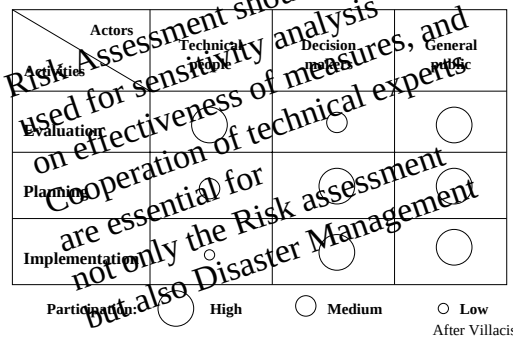
Effective Risk Management



Risk Assessment should be used for sensitivity analysis on effectiveness of measures, and Cooperation of technical experts are essential for not only the Risk assessment but also Disaster Management

After Villacis

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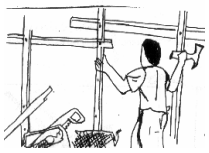
DISASTER RISK MANAGEMENT ACTION PLANNING

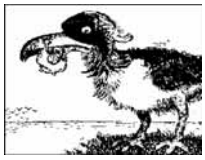
PARTICIPATORY URBAN RISK MANAGEMENT:
Action Workshop on Education for Sustainable Development

by Lorna P. Victoria, Center for Disaster Preparedness

Why Plan?

Participatory Risk Assessment unites in understanding of disaster risk (hazards vulnerabilities & capacities)





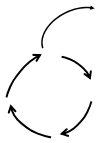
Participatory DRM Planning unites in commitment & actions to reduce disaster risk, to reduce vulnerabilities and increase capacities

Why Plan?

•Road map, guide to transform at risk locality to be disaster resilient

•Charts the course of community's progression towards safety, disaster resilience and sustainable development

Why Action Planning?



•Participatory, short-term, visible, output-oriented process that enables community to plan risk reduction actions or development in their community & lead the implementation of such action plans

•Risk reduction as a process of progressive improvements to be approached incrementally but surely

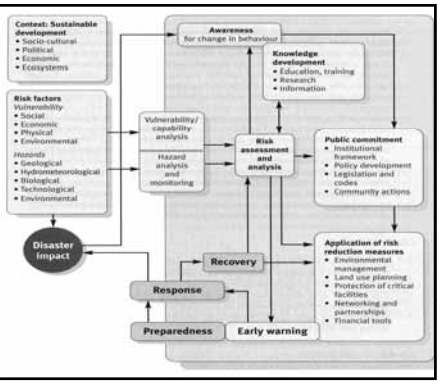
•Series of actions; acting to induce others to act

What to Plan?

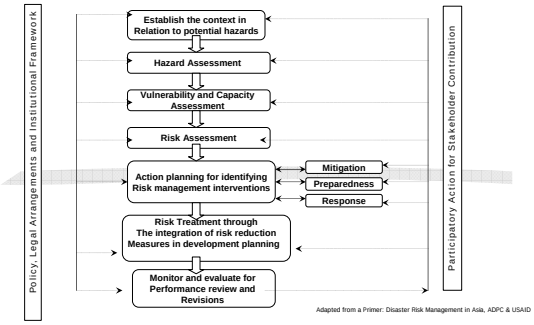
Framework for Risk Reduction
UNISDR

Minimize vulnerabilities and disaster risk throughout society to avoid (prevention) or limit (mitigation and preparedness) the adverse impacts of hazards within the broad context of sustainable development

→Strengthen capacities!



What to Plan?

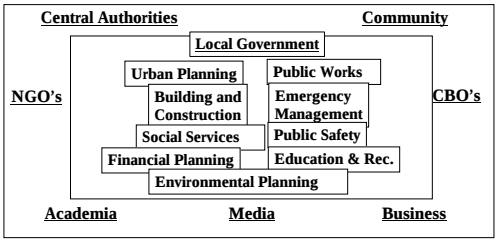


Mainstreaming disaster risk management through the integration of disaster risk management in other sectors

What to Plan?

CROSS-ORGANIZATIONAL INTEGRATION

Integration of disaster risk management within local government functions, in ***coordination*** with the central authorities and in ***partnership*** with various stakeholders/actors



Adapted from F. Bendimerad in WBI Comprehensive DRM Framework Course On-line

What to Plan?

Release of 'Pressures' to Reduce Disaster Risk: Progression of Safety

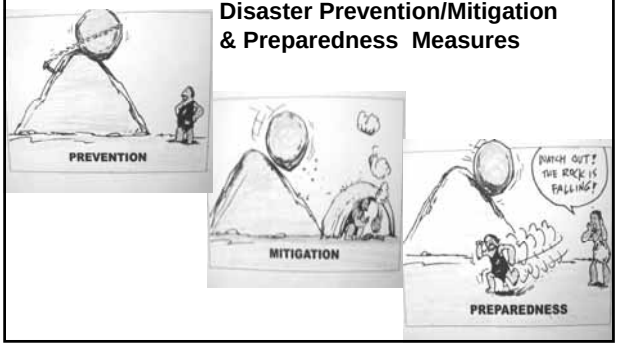
(Modified and adapted from Balikie et al, 1994, At Risk, Natural Hazards, People's Vulnerabilities and Disasters, Routledge, London)

Progression of safety

Reduce hazard	Reduce disaster risk	Achieve safe conditions	Reduce pressures	Address root causes
Measures that reduce intensity of hazard: Dikes / dams Wind breaks Mangrove Etc.	Aim: Resilient community - Limited damage - Sustained livelihood - Aware of hazard risks - Counter disaster plan - Functional community organization - Able to address root causes of disasters - etc.	- Safe place to go - Warning system - Diversify sources of livelihood - Raise public awareness - Community organizing - Literacy - Skilled Health Workers - Community spirit	- Protected environment - Land use plan - Participation in political decision-making - Capacity to negotiate resources from GO / NGOs - Access / control to means of production - Advocacy on local level	- Increase access / control of vulnerable groups to power structures and resources - Through advocacy challenge any ideology, political or economic system that causes or increase vulnerability

What to Plan?

Disaster Prevention/Mitigation & Preparedness Measures



What to Plan?

Prevention & Mitigation Measures

1. **Structural/Hard**

2. **Non-Structural/Soft**

- **Preventive Health**
- **Legislation**
- **Sustainable Livelihood**
- **Safety Measures**

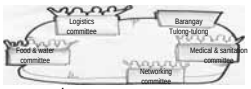
- **Research & Advocacy**

What to Plan?

Preparedness Measures

- **Training and education and drills**

- **Early warning and Public Awareness**



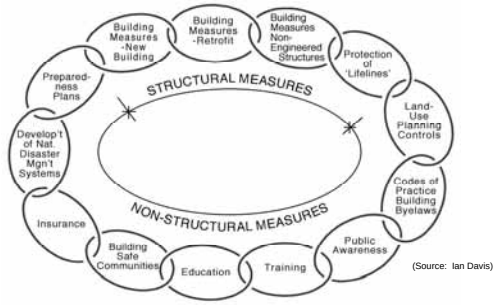
- **Strengthening organization and inter-agency arrangements**

- **Logistics support and stockpile**

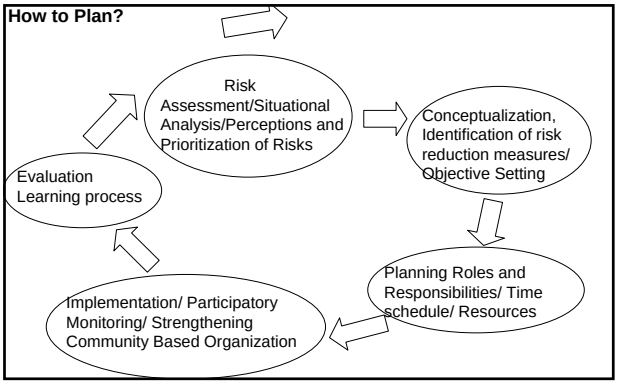
The Chain of Disaster Risk Reduction

(Source: Ian Davis)

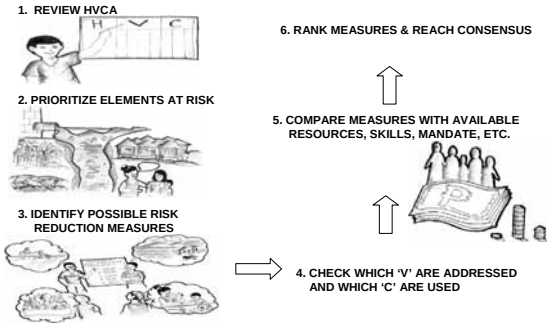
Sample: The Safety Chain for Earthquakes



How to Plan?



How to Plan? Use the Results of the Participatory Risk Assessment



How to Plan?

Steps in Formulating the DRM Plan

a. **Hazard Vulnerability Capacity Assessment (Risk Assessment)**
b. **Identify the objectives and targets of the Disaster Risk Management Plan**
c. **Identify the Disaster Risk Measures**
d. **Determine the Resources Needed**
e. **Determines Schedules and deadlines**
f. **Assign responsibilities for activities**
g. **Identify and address critical elements and barriers to plan implementation**
h. **Lay down operational procedures and policies**
i. **Discuss with Community members and Other Stakeholders**
j. **Implementation, periodic review and plan improvement**
k. **Continued progress in ensuring safety, building resilience and attaining sustainable development**

How to Plan?

DISASTER RISK MANAGEMENT PLAN FORMAT

a. Brief Description of the Community
b. Disaster Situation (Summary of Disaster History and Risk Assessment)
c. Objectives and targets of the DRMP
d. Strategies and Activities for Risk Reduction
e. Roles, Responsibilities
f. Schedules and Timetables
g. Budget and Resources for Plan Implementation
h. Annexes

Disaster Management Action Plan
(July - December 2006; 2007)

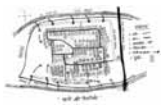
ACTIVITIES	WHEN	RESPONSIBLE			RESOURCES NEEDED		SUPPORT AGENCY
		Agency	Committee	Person	Existing	To look for	

How to Plan? Useful Participatory Tools

For Setting Objectives and Priorities

Gathering Support and Spreading Responsibility in Plan Implementation

Resource Analysis

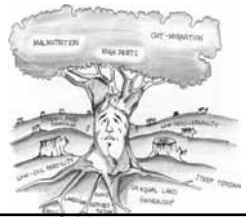


Getting Consensus and Reality Check

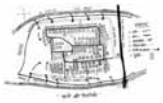
For Setting Objectives and Priorities

Visioning

Problem Tree to Solution Tree



Resource Analysis



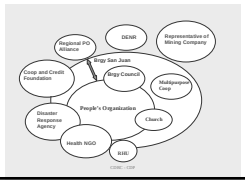
Resources Analysis Matrix

Resources needed to implement the risk reduction measures and activities	Resources existing in the community and its location (ownership) & -- accessible for use)	Resources existing in the community and its location (ownership) – not accessible for use; why not accessible?	Actions or interventions needed to make existing resources accessible. How long will it take to make these available?	Actions or interventions needed to generate the resource gap. How long will it take to make these available?

Gathering Support and Spreading Responsibility in Plan Implementation

Social and Organizational Analysis Matrix

Stakeholders who can support the CBDRMP	Stakeholders who are expected to oppose the CBDRMP	Current status of relationship with the community	Interest and expectations of each stakeholder	Power & influence wielded	Role in the implementation of the CBDRMP	Necessary actions



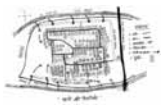
Venn Diagram

How to Plan? Useful Participatory Tools

For Setting Objectives and Priorities

Gathering Support and Spreading Responsibility in Plan Implementation

Resource Analysis



Getting Consensus and Reality Check

Getting Consensus and Reality Check

Ranking and Scoring

FORCE FIELD ANALYSIS

Driving Forces
Opportunities

Hindering Forces
Constraints

Reducing vulnerabilities by building on and increasing capacities

How to Plan? Some Techniques for Participatory Planning for Urban Areas

Future Search – Review the past, explore the future, create ideal futures, identify common ground, make action plans

How to Plan? Some Techniques for Participatory Planning for Urban Areas

Town Watching – After field survey and mapping good and bad practices, possible countermeasures to address vulnerabilities, priorities, degree of difficulty and responsibility for implementation

Disaster Imagination Game – The estimation of possible damage of the hazard to the locality is put on maps and become the basis for the action plan

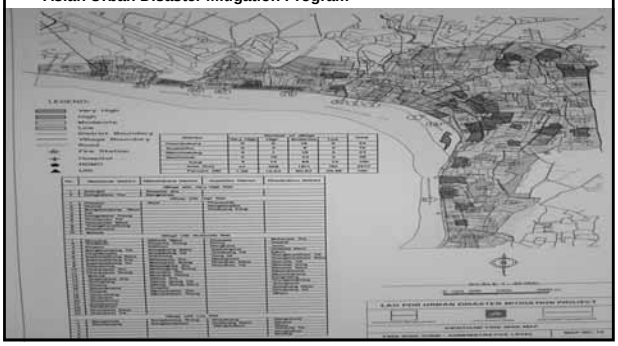
Facilitating Participatory Planning at the Community Level

HELP PREVENT FIRE

Organized by URI, NDMO, Fire prevention and protection Department,

Vientiane Municipality, ADPC and USAID

Laos Urban Disaster Mitigation Program-
Asian Urban Disaster Mitigation Program



Lao Urban Disaster Mitigation Program in Ban Hatsady, Ventiane

Ban Hatsady Community Fire Reduction Workshops

Oct. 24 - Opening Ceremonies

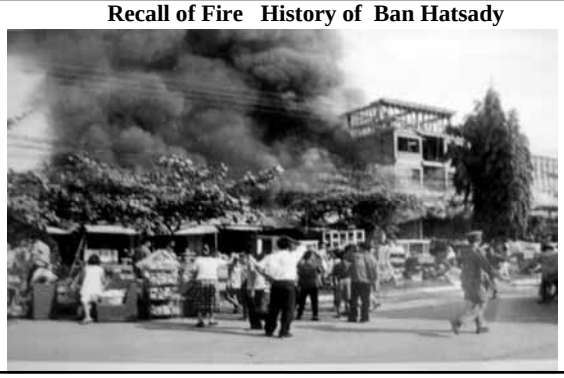
Oct. 25 - Process of Fire Risk Assessment & Mapping

Oct. 26 - Community Survey and Mapping & Oct. 27

Oct. 28 - Initial Identification of Community Fire Prevention Measures

Nov. 10 – Risk Reduction Action Planning Workshop

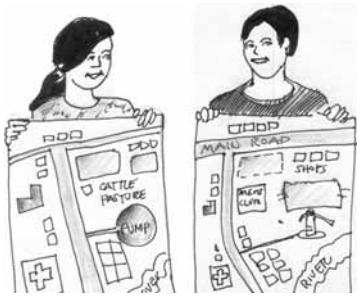
Recall of Fire History of Ban Hatsady



When? Where? Damages?

What were Causes?

What Do We Map? How Do We Map?

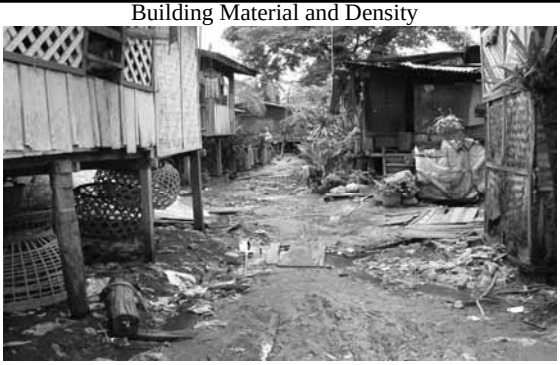


Ban Hatsady Fire History

Fire Sources in Ban Hatsady – Risk Factors

Related to Livelihood

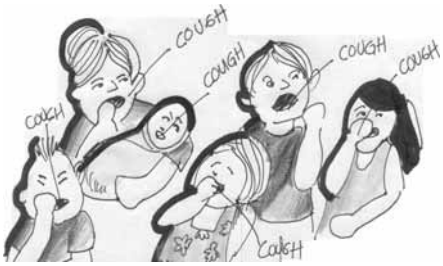
Building Material and Density



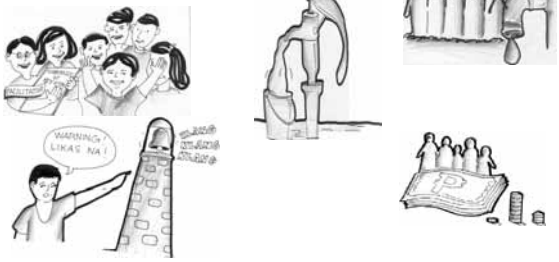
Quality of Electrical Wiring System

Access – narrow road, dead end, obstruction

Houses and Facilities where there are many children and elderly; day care

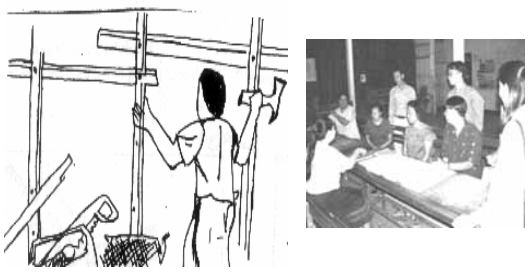


Resources - fire hydrant, water sources, participants, Ban officials, health professionals, teachers ...



Community Fire Risk & Resources Assessment Mapping

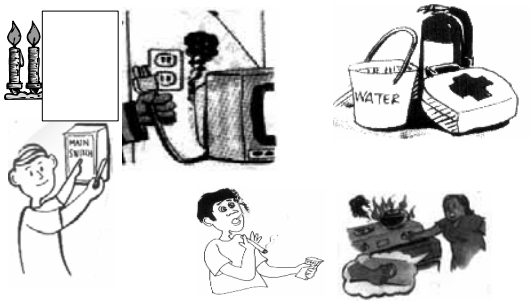
Why Plan? What to Plan? How to Plan?



Strategies -- Raising Community Awareness

Strategies -- Community Training & Drills

Strategies -- Individual, Family and Community Safety Measures



Strategies -- Organizing & Strengthening of Community Fire Brigade

--Networking and Resource Generation

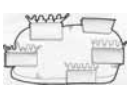
Public awareness Committee

Networking Committee

Night Watch Committee

Strategies

Networking and Resource Generation



Why Plan? What to Plan? How to Plan?

What to Plan? How to Plan?

Risk Reduction Plan Format:

I. Brief Description of Ban Hatsady

II. High Fire Risk of Ban Hatsady

High and Moderate Fire Risk Attributes
Damages to Life, Property, Livelihood, Development If Fire Occurs
Attachments: Risk Assessment Maps

III. Objectives of the Risk Reduction Plan

III. Key Fire Risk Reduction Strategies

IV. Ban Hatsady Risk Reduction Action Plan,
November 2002 – December 2003

What to Plan? How to Plan?

Ban Hatsady Risk Reduction Action Plan
(November 2002, December 2003)

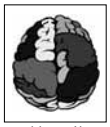
ACTIVITIES	WHEN	RESPONSIBLE			RESOURCES NEEDED		SUPPORT AGENCY
		Unit	Committee	Person	Existing	To look for	

Urban Risk Assessment

Decision-Making

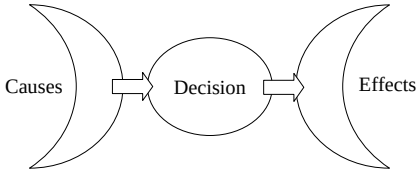
Hari Srinivas
United Nations Environment Programme

1



Decision-making

Decisions are being taken everyday – by everyone, that affects many aspects of their daily life.



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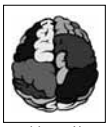
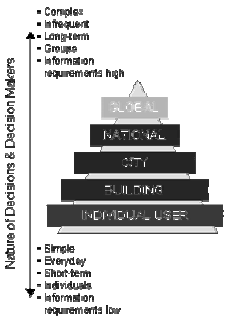


Decision-making Pyramid



Decisions that we take – for whatever reason – are interlinked. These are taken at the individual level, all the way to the global level.

This can be illustrated with the Decision-making Pyramid.

3

Decision-making Pyramid

Pyramid Bottom: simple decisions taken everyday
Pyramid Top: complex decisions taken more infrequently.

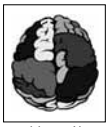
Activities at the local/micro level influences the global level;
Activities at the global level influences the local/micro level.

From bottom to the top:

1. individual decisions are replaced by decisions taken by groups, the largest (i.e. everyone) at the topmost
2. decisions become more complex covering a broader range of different aspects
3. quality and quantity information required for decision-making increases
4. short-term decisions are replaced by longer-term decisions.

Decision-Making Pyramid

4

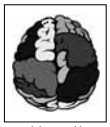


Decision-making Pyramid

- Link between top and the bottom of the pyramid is cyclical: everyday choices and preferences at the bottom influences policies developed at the global level.
- Decisions and agreements made at the global level influences action at the bottom of the pyramid.
- Example: the Montreal Protocol on ozone depletion at the global level influences product choices (say a refreigerator) at the local level.
- Outputs generated at the top of the pyramid - the global level - are policy oriented and have indirect impacts on everyday life,
- Outputs generated at the bottom of the pyramid - the individual level - are action-oriented and have direct impacts on everyday life.

Decision-Making Pyramid

5



Decision-making Pyramid

Global decision:

Kyoto Protocol

"WE HAVE TO REDUCE OUR CO2 EMISSIONS"

⇩

What kinds of local decisions will have to be taken??

6

Decision-Making

Decision-making Pyramid

The key message of the decision pyramid is clear:

(1) We need to ensure that global goals and objectives are translated to viable local actions that cumulatively help achieve the objectives.

(2) Appropriate stakeholders should be involved at the right level, and partner with each other for the purpose of taking the right action at that level;

(3) Proper communication among stakeholders - between levels and within a particular level is very important.

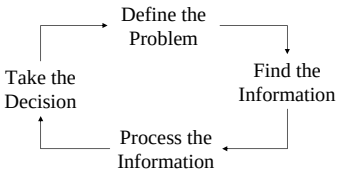
7

Decision-Making

Information for Decision-making

IMPORTANT:
Ensure that the right *information* is available at the right *level* at the right *time* to the right *person* – so that the right *decision* can be taken!

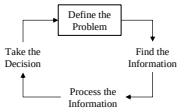
Information for Decision-Making



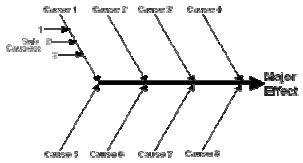
8

Decision-Making

Information for Decision-making



1. Define the problem:
Take time to properly define the problem. What is the issue to be covered? What is the problem? What decisions need to be taken?

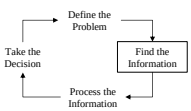


Remember that sometimes, the real cause can lie hidden behind the 'visible' causes.

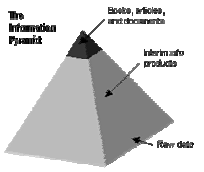
9

Decision-Making

Information for Decision-making



2. Find the information:
Determine the sources from where information needed for decision-making can be obtained. What information needs to be taken? Who has that information? Which component of the problem at hand will it help?

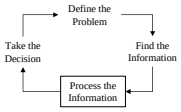


Remember that information can also lie in experiences and insights that are not 'recorded.' Also look at the information pyramid to see if all levels are covered ...

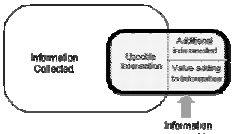
10

Decision-Making

Information for Decision-making



3. Process the information:
This where the information gathered is matched with the problem in hand. Which parts of the information collected can be used? What additional info is needed? How can information be best presented to take decisions?

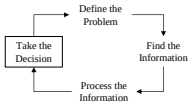


Remember that it is critical to package the information to fit the audience using the right media …

11

Decision-Making

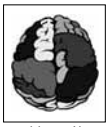
Information for Decision-making



4. Take the decision:
In an interactive and inclusive process, form an opinion from the information collected and use it to take the decision. Has the decision taken help in solving the problem at hand? Was the decision satisfactory and took into account all the views of concerned parties?

Remember that implementing the decision (actors and actions), as well as monitoring and evaluating the actions taken, are integral parts of the decision!

12



Decision-Making

Principles of Decision-making … *1*

- **Purpose-Driven**. People need a reason to participate in the process.
- **Inclusive, Not Exclusive.** All parties with a significant interest in the issues should be involved in the collaborative process.
- **Educational.** The process relies on mutual education of all participants.
- **Voluntary.** The parties who are affected or interested participate voluntarily.

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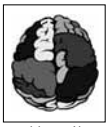
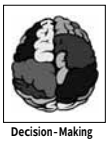


Decision-Making

Principles of Decision-making … *2*

- **Self-Designed**. All parties have an equal opportunity to participate in designing the collaborative process. The process must be explainable and designed to meet the circumstances and needs of the situation.
- **Flexible**. Flexibility should be designed into the process to accommodate changing issues, data needs, political environment, and programmatic constraints such as time and meeting arrangements.
- **Egalitarian**. All parties have equal access to relevant information and the opportunity to participate effectively throughout the process.

14

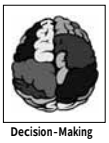


Decision-Making

Principles of Decision-making … *3*

- **Respectful**. Acceptance of the diverse values, interests, and knowledge of the parties involved in the collaborative process is essential.
- **Accountable**. The participants are accountable both to their constituencies and to the processthat they have agreed to establish.
- **Time Limited.** Realistic deadlines are necessary throughout the process.
- **Achievable**. Commitments made to achieve the agreement(s) and effective monitoring are essential.

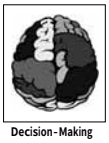
15



Decision-Making

Steps in Risk Management

16



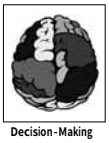
Decision-Making

Criteria for Decision-making to reduce Environmental Risk

1. Compliance

- Compliance with Local Environmental Laws
- Compliance with National Environmental Laws
- Compliance with Multilateral Environmental Agreements (MEAs)
- Meeting the objectives (e.g. 3R, Remediation, Rehabilitation, etc.)

17



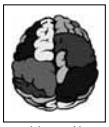
Decision-Making

Criteria for Decision-making to reduce Environmental Risk

2. Technical Suitability

- Compatibility with local Natural Conditions(Geographical, Climate)
- Extent of local materials usage
- Availability of local expertise
- Track record on performance
- Compatibility with existing situation (technology, management systems)
- Adaptability to future situations
- Process Stability
- Level of Automation / Sophistication

18

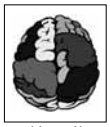


Criteria for Decision-making to reduce Environmental Risk

3. Environment: Resources and Emissions

- Resource Usage
- Space Requirement
- Energy Consumption per unit
- Extent of use of renewable energy
- Extent of use of waste materials as input
- Water Consumption
- Raw Material Consumption
- Resource Augmentation Capabilities
- Emissions and odour
- Extent of use of Hazardous Materials

19



Criteria for Decision-making to reduce Environmental Risk

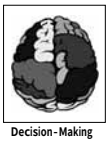
4. Economic / Financial Aspects

- Capital Investment
- Operation and Maintenance Costs
- Benefits (Energy, fertilizer, reclaimed land, enhanced biodiversity)

5. Social/Cultural Aspects

- Acceptability
- Extent of necessary resettlement and rehabilitation of people
- Income Generation Potential

20



Criteria for Decision-making to reduce Environmental Risk

6 Economic / Financial Aspects

- Capital Costs
- Operation and maintenance costs
- Benefits of the decision/action
- Economic Viability
- Livelihood recovery

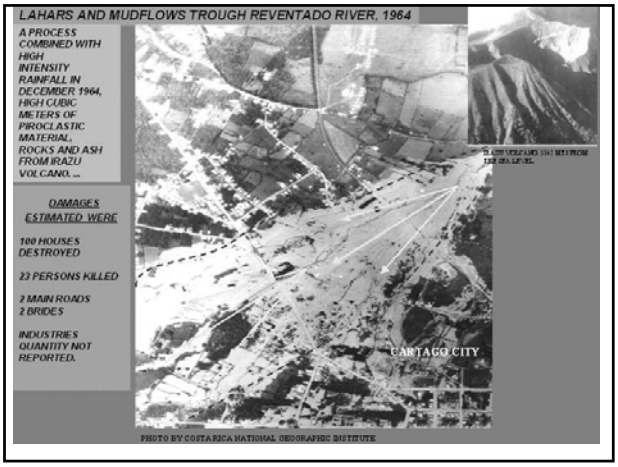
21

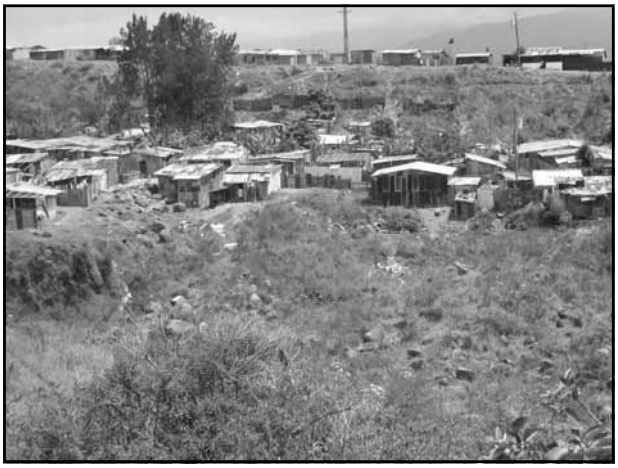
Action Workshop on Education for Sustainable Development at Kyoto University on 23-30 July 2006

Participatory Urban Risk Management

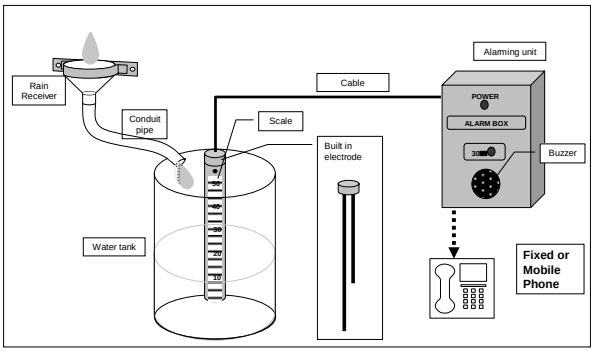
-Implementation Management-

Hidetomi Oi, JICA



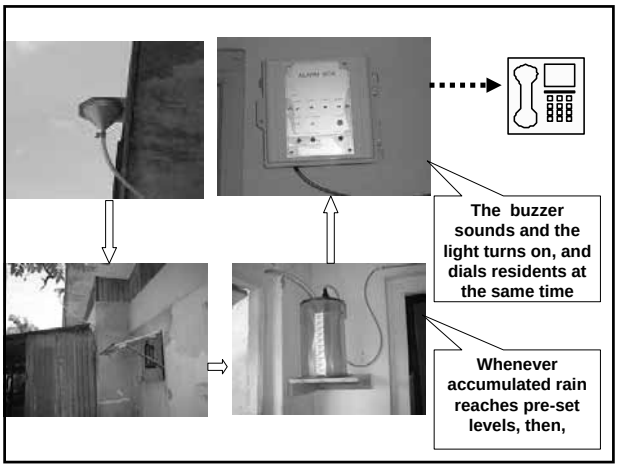


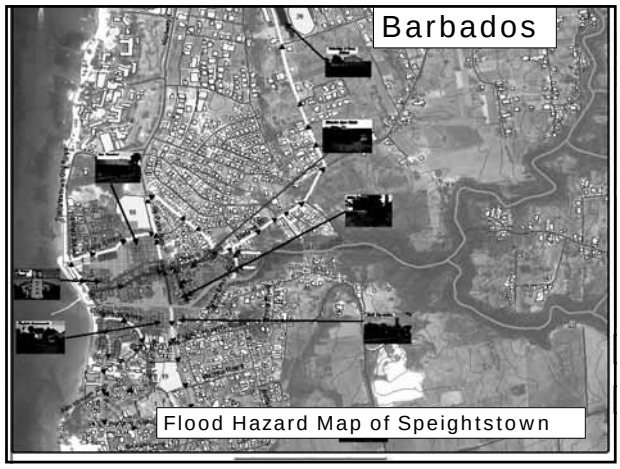
Rainfall equipment with the alarm unit for community operated flood warning



Stuff gauge for community flood warning

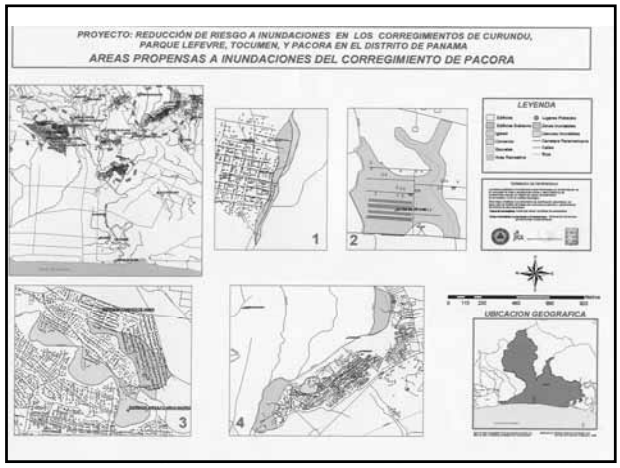
Problem: Difficult to go to the sites under heavy rainfall and strong wind

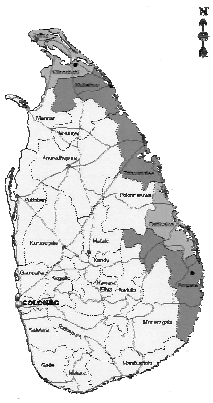




Community Meeting

Presentation of Hazard Maps





Vocational training

Shanty along the Dehiwala Canal
(Before the project implementation)

Improved Dehiwala Canal

Lessons Learned

Module 5

Education for Sustainable Development:

For Pro-active Risk Reduction Initiative

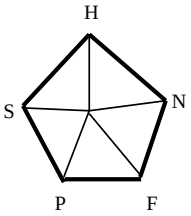
Rajib Shaw

Think Globally, Act Locally

Field of Sustainable Development

What is to be sustained?		What is to be developed?
Life support systems (Resources, environment, ecosystem)	***In what relation?***	**Economies** (Production, Consumption, Wealth, Distribution)
Natural Environment (Species, biodiversity, ecosystem, earth)	***For How long?***	**Societies** (Capacity building, organization, institutions)
Communities (Traditions, values, ethnic group, culture, places)	***At what scale?***	**People** (life expectancy, education, capabilities, choices)

Different types of capital



H: Human capital
S: Social Capital
P: Physical Capital
F: Financial Capital
N: Natural Capital

WSSD 2002: Education

Achieving sustainable development requires:	*Education provides the skills for:*
Recognition of the challenge	*Learning to know*
Collective responsibility and constructive partnership	*Learning to live together*
Acting with determination	*Learning to do*
The indivisibility of human dignity	*Learning to be*

Education for Sustainability

Education for Sustainability is a ***lifelong learning process*** that leads to an informed and involved citizenry having the creative problem solving skills, scientific and social literacy, and commitment to engage in responsible ***individual and co-operative actions***.

These actions will help ensure an environmentally sound and economically prosperous future.

Education for Sustainability has the potential to serve as a tool for building stronger ***bridges between the classroom and business, and between schools and communities***.

Decade of ESD (DESD)

- International Decade of Education for Sustainable Development (ESD): 2005-2014
- UNESCO as the key organization of the decade
- Governments around the world are invited to use the Decade to integrate education for sustainable development into their national educational strategies and action plans at all appropriate levels.
- *Our biggest challenge in this new century is to take an idea that sounds abstract – sustainable development – and turn it into reality for all the world's people*. Kofi Annan
- Learning to know: Recognizing the challenge
- Learning to do: Acting with determination
- Learning to be: Invisibility of human dignity

DESD Domains

- Basic Education
- Reorienting existing education at al levels to address sustainable development
- Developing public understanding and awareness of sustainability
- Training

DESD Focus: Advocacy, Communication, Networking to include sustainable development concerns and goals in their own prorgams

Education for Sustainable Development

Education for sustainable development in not restricted to the transmission of knowledge and skills. It should be about learning how to obtain and synthesize the knowledge that equips us, individually and collectively, to forge a sustainable coexistence with our social and ecological environments.

Education: the Key Lessons

- It is essential, valued, welcomed and it works!
- However many governments give it a low profile
- Education and Training are costly, but yield rich dividends
- There is a lack of knowledge concerning the effectiveness of education and training

Genuine Learning:

" Tell me, and I'll forget
Show me, and I may remember
Involve me, and I will
understand"

Anon

Source: Ian Davis

Disaster Education Survey

- **It was difficult to implement rescue activities smoothly and amply.**
- **In area which had ties, many people were rescued by neighbor.**
- **Cooperation is necessary in livelihood in evacuation center.**
- **In area which had ties, community and local government made cooperative relationship and implemented a rehabilitation plan which served community needs.**

Enhancing community (or individual) awareness for disaster is important.
How to sustain the efforts in community and individual level before the event

Culture of Disaster Preparedness

Goal, purpose, objective of survey

Goal

- To revisit the direction of disaster education which can enhance awareness of disasters (earthquakes).

Purpose

- To comprehend how earthquake experiences and disaster education affect awareness.

Objectives

- To comprehend what type of damages student experienced.
- To comprehend what education process student have undergone.
- To comprehend differences between students have experienced earthquakes and students have not.
- To comprehend differences between students have learned disaster education and students have not.

Target and the survey process

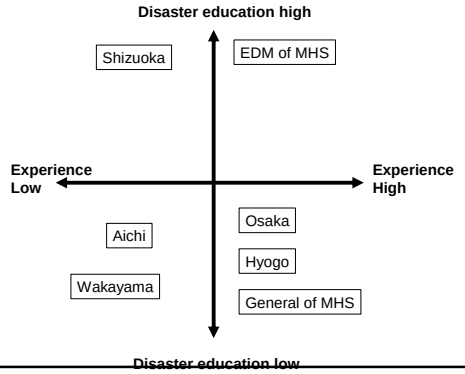
Prefecture
Shizuoka, Aichi, Osaka,
Hyogo (including Maiko High School),
and Wakayama

Target Group
1st grade high school students
(Age group: 15-16 years)

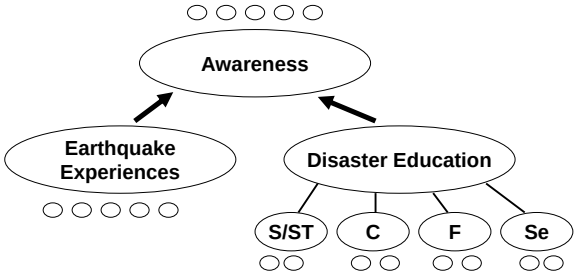
Way of survey
- The board of education of each prefecture chose schools
- Initial testing of questionnaires in Maiko High School
- UNCRD sent questionnaires to each schools.
- Teachers in each school supervised students and implemented survey.

Prefecture	school×class	Student
Shizuoka	3×3	337
Aichi	2×2	156
Osaka	2×2	149
Hyogo	2×2	158
	1×2(Maiko gen.)	70
	1×1(Maiko e.d.m.)	40
Wakayama	2×2	155
total	12 schools X 28 classes	1065

Target Groups

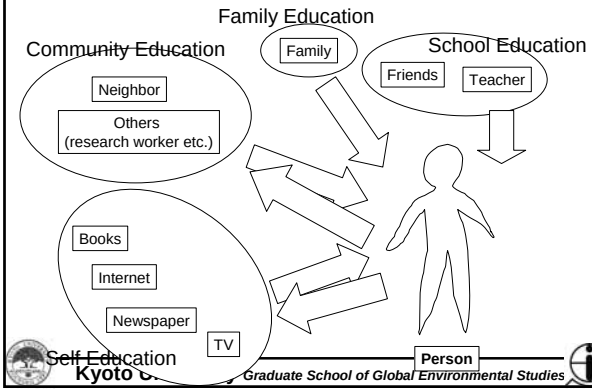


Sources of Knowledge

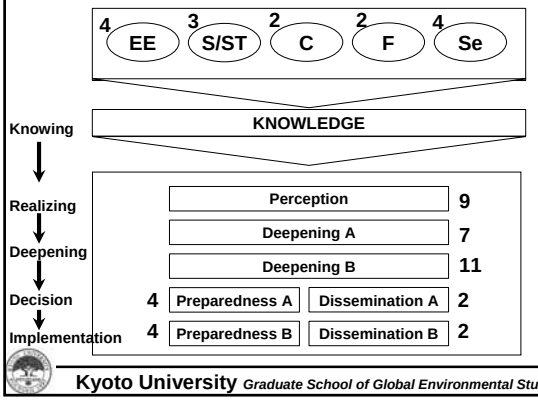


S: School Education, **ST**: School education with active involvement of student
C: Community Education, **F**: Family Education **Se**: Self Education

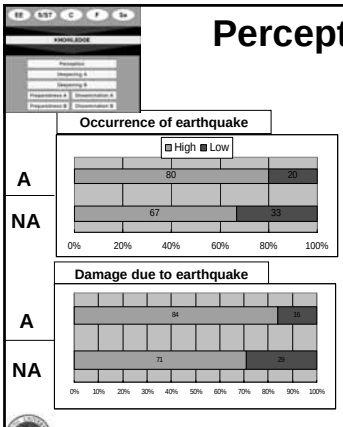
Tools of Education



Integrated model

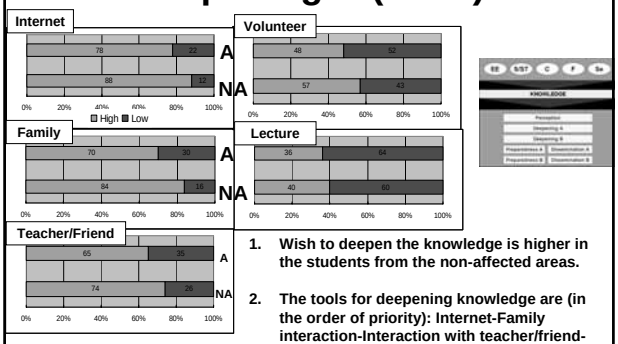


Perception



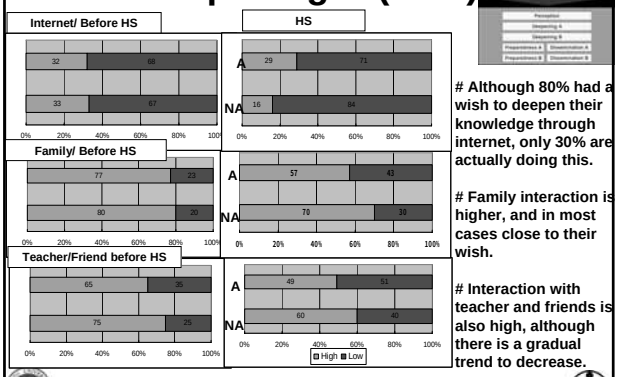
1. **Two types of questions were asked: possibility of occurrence of earthquake, and possibility of damages.**
2. **Students from affected areas have higher perception on both these questions.**
3. **This has been exemplified for different questions on occurrence and damage of the earthquake.**

Deepening A (Wish)



1. Wish to deepen the knowledge is higher in the students from the non-affected areas.
2. The tools for deepening knowledge are (in the order of priority): Internet-Family interaction-Interaction with teacher/friend-Volunteer activities-Listening to lectures.

Deepening B (Fact)

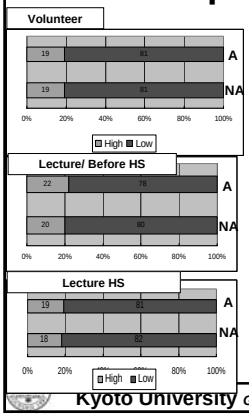


 # Although 80% had a wish to deepen their knowledge through internet, only 30% are actually doing this.

 # Family interaction is higher, and in most cases close to their wish.

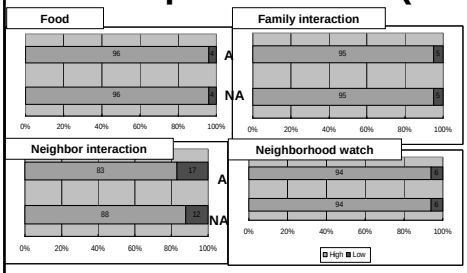
 # Interaction with teacher and friends is also high, although there is a gradual trend to decrease.

Deepening B (Fact)



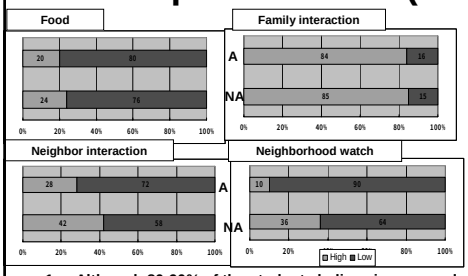
1. Although 50% expressed their wish to deepen their knowledge through volunteer activities, 20% actually doing this.
2. Also, 20% is attending lectures to deepen their knowledge.

Preparedness A (Wish)



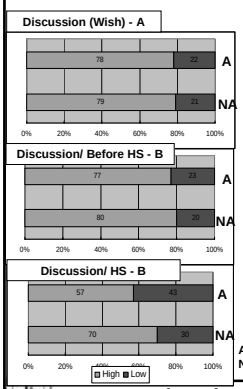
1. 80-90% of the students believe in preparedness.
2. Emergency food, family interaction and neighborhood watch system have higher priority, while neighbor interaction has relatively lower priority.

Preparedness B (Fact)



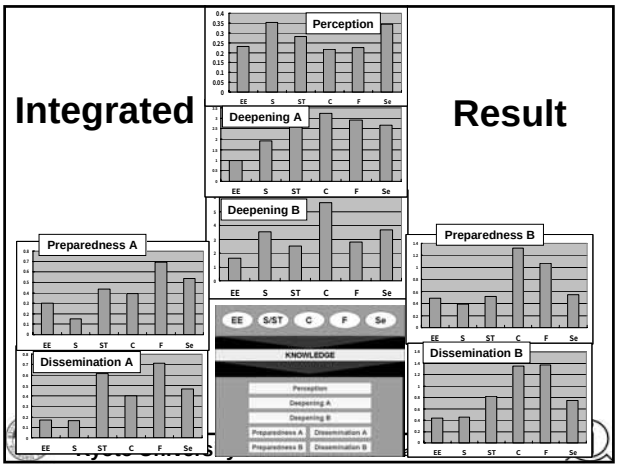
1. Although 80-90% of the students believe in preparedness, only 20% is doing it for emergency food, 30-40% doing it for neighbor interaction, and 10 to 40% are doing it for neighborhood watch. However, almost 85% are doing it for family interaction.
2. It is observed that the non-affected area students are better prepared than affected area.

Dissemination A and B



1. 80% expressed their wish to share knowledge through discussion.
2. Around 80% were doing this through discussion before HS, however there is a decrease for the students from affected

A: Affected area by the GHA Earthquake: Number of Students: **417**
NA: Not affected by the GHA Earthquake: Number of Students: **648**



◆ Earthquake experience is ***not*** the major contributing factor for awareness.

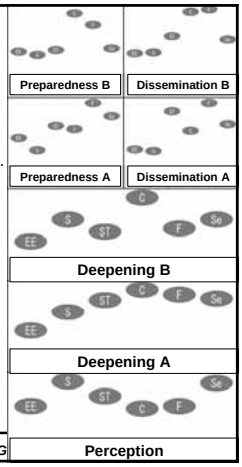
◆ School education is important in enhancing ***perception*** of earthquake disaster.

◆ Earthquake experience is more effective than school education to take appropriate actions for ***preparedness*** and ***dissemination***.

◆ Family education is the most vital for action in ***preparedness*** and ***dissemination***.

◆ Self education has higher contribution for ***perception*** and ***deepening*** of earthquake awareness, while for preparedness and dissemination, it depends more on family education.

◆ Community education is essential for actions in ***dissemination*** and ***preparedness***, and contributes significantly in ***deepening*** of awareness.



Enhancing Action

	Listen				Watch				Do									Talk	
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
Perception					○														○	
Deepening A								○								○			○	○
Deepening B								○								○	○	○		○
Preparedness A																			○	○
Preparedness B																			○	○
Dissemination A																			○	○
Dissemination B																○	○	○	○	○

From realization to action, TALK has more impact.
Effectiveness: [Talk]>[Do]>[Watch]>[Listen].

Disaster Education: Future

For students ' ' '
'S': passive
'F' : active

→ Active learning is important to enhancing awareness level and making action.

- ✓ **Watching TV or videos should be adopted as the part of education process.**
- ✓ **Disaster simulation exercise is useful as a learning tool.**
- ✓ **Conversation on disaster related topics with friends, families and teachers is an effective way of disaster education.**

Ideal school disaster education:

- makes students learn disaster management actively.
- makes disaster management a part of life of students.
- builds awareness that makes students try community activities, family talking, and self learning,
- leading to the **Culture of Disaster Preparedness.**

Environmental Education

-Environmental education is a process in which individuals gain awareness of their environment and acquire **knowledge, skills, values, experiences**, and also the **determination**, which will enable them to act - individually and collectively

-Environmental education has always been there

-People have always lived symbiotically with nature, and built stories, religions and cultures around nature and the local environment

Attitudes and Values of EE

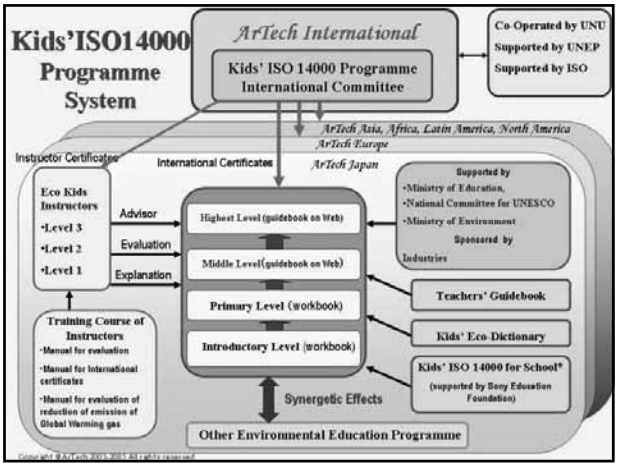
- Care for the community.
- Respect for the beliefs and opinions of others.
- Respect for evidence and rational argument.
- Tolerance and open-mindedness.

KIDS ISO: Proactive Learning

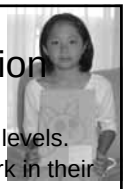
- **Kids' EMS Programme**
- ArTech and UNU, UNEP and UNESCO and international organization as ISO.
- **1. To stimulate environmental awareness of children**

  2. To teach and make practice of methodology of environmental management to children

  3. To make experience of working together through group, networks locally and globally.

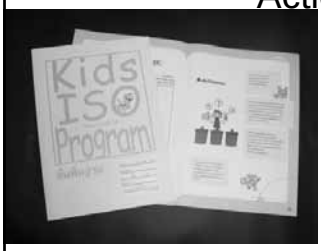


Different levels of education



- For children, the programme consists of 4 levels.
- **Introductory Level** is just for 2 weeks work in their home by use of Workbook
- **Primary Level** is 8 weeks work in their home by use of Workbook
- **Middle Level** is about 0.5 - 1 year work as a group on environmental issues in the region where they live.
- **Highest Level** is 1-2 years to work same as the Middle Level, by collaborating with foreign partners of children.

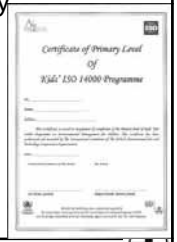
Action



- Workbook, Checklist
- Introductory lessons
- Enhance actual action
- Evaluation

Certification

- To learn and to make practice of simplified methodology of management "**PDCA cycle**" methods on environmental subjects in their household with their family members



- Primary Level Certificate
- CO2 certificate

Different Models of Education

- Model 1: School promoted education: Maiko High School, Kobe
- Model 2: NGO promoted education: Nishinomiya
- Model 3: NGO promoted education: KIDS-ISO
- Model 4: Local government promoted education: Saijo
- Model 5: Spontaneous community education: Shirakaa-go

Model 1: School promoted education

- Promoted by Maiko High School
- Curriculum developed over real life experiences over time
- Student's active education
- Supported by local governments

Old Japanese Houses

Buildings

Railroad and Hanshin Express Way

City on Fire

Fundamental concept 1

The education of disaster mitigation is based on the lessons of the Great Hanshin-Awaji Disaster. The course makes the students think of the importance of life, cultivates the students' power to cope with disasters, and brings up the human beings who can contribute to our society.

Fundamental concept 2

The students are expected to understand deeply about the various environments (the natural environment and the social environment) by learning the mechanism of the natural phenomenon and the relationship between disasters and human society.

Fundamental concept 3

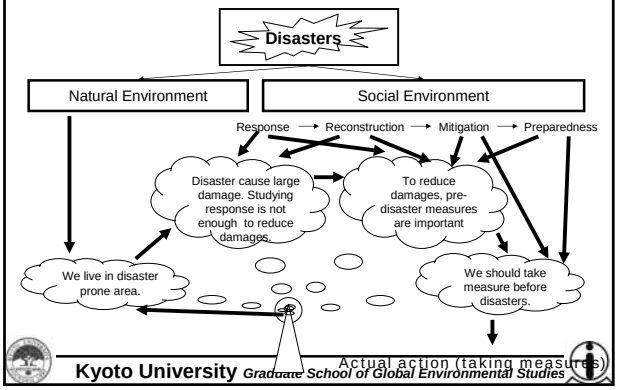
Maiko HS cooperate with universities, research institutes and coherent organizations. Students' understanding of the environment and disaster mitigation is deepened through the experience learning. To raise the students' attitude to "Think Globally, Act Locally" is one of the main goals to attain. Maiko HS aims to bring up the individuals who can take actions independently.

Characteristic Activities

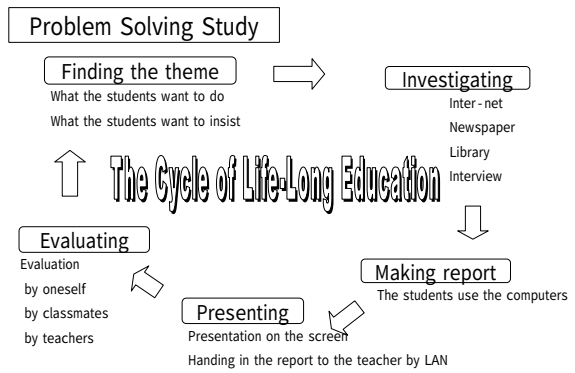
- Teachers from ... of the school
- Studies ...
- Co...
- Study ...
- Eva... itigation
- Pre... e of school
- International exchange
- Problem solving study

Active & Practical

Contents of DE in Maiko



Problem Solving Study



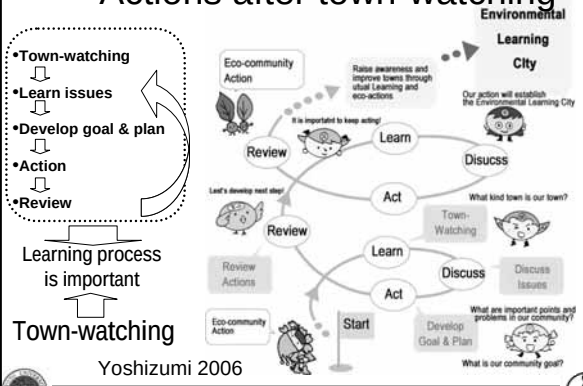
Model 2: NGO promoted education

- Promoted by LEAF in Nishinomiya
- Started with student education, gradually spread over different over different sectors
- Strongly supported by local government and corporate sector

Activities on Environmental Learning

- 1989: Citizens' Nature Survey
- 1990: Citizens' Nature Survey
- 1992: Earth Watching Club Nishinomiya
  ←Model of the Eco-club
- 1998: Established a NPO, "LEAF"
- 2002: Established the Environmental Learning City
  Steering Committee of Nishinomiya City
- 2003: Environmental Learning City Declaration
- 2005: Published the New Environmental Plan
- 2005: Enacted city ordinances about environment
- 2005: Eco-community project launched
  Eco-community Workshops were held in 8 areas

Actions after town-watching



Yoshizumi 2006

Model 3: NGO promoted

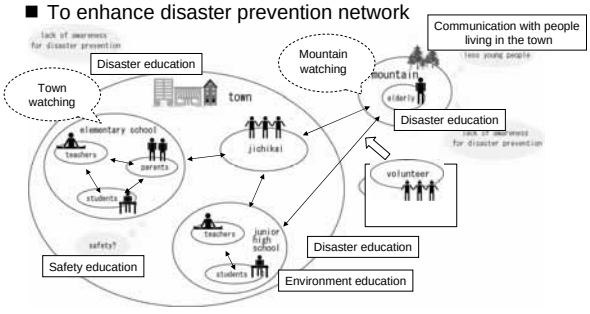
- Promoted by NGO, supported by national governments, UN agencies, ISO
- KIDS ISO program: EMS
- Working closely with local schools
- Development of a monitoring system of environmental education in daily life.

Model 4: Local government promoted

- Promoted by local government
- Close cooperation of school, PTA, resident's association
- Supported by academic institutions
- Link the mountain and plain areas, rural and urban areas

Disaster education program: Saijo

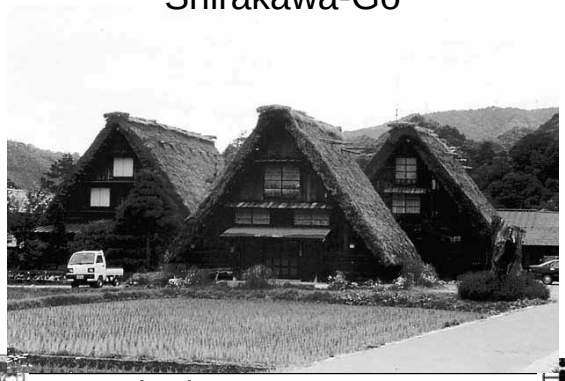
- To enhance disaster prevention network

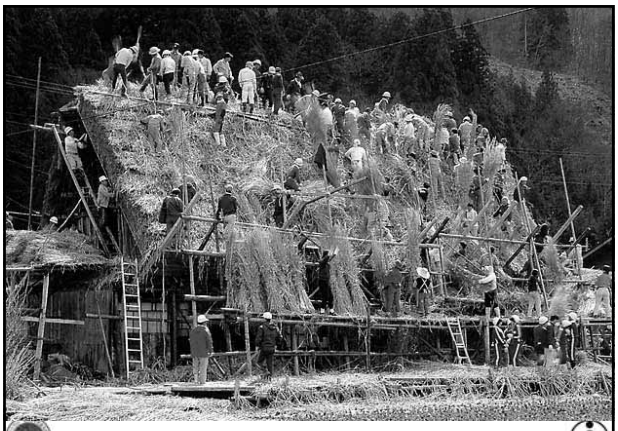


Model 5: Spontaneous Community Education

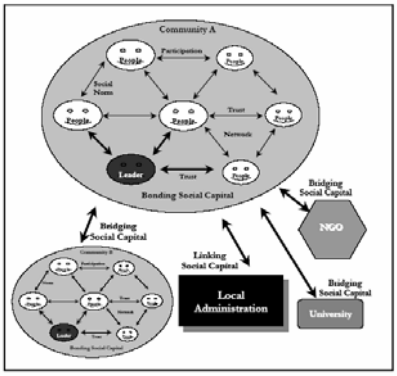
- Spontaneously existing in community over years
- Self-promoted by community itself
- Based on the trust, norm, leadership of community: enhancing social capital

Shirakawa-Go





Social Capital: Re-visited Issues



Nakagawa and Shaw (2004)

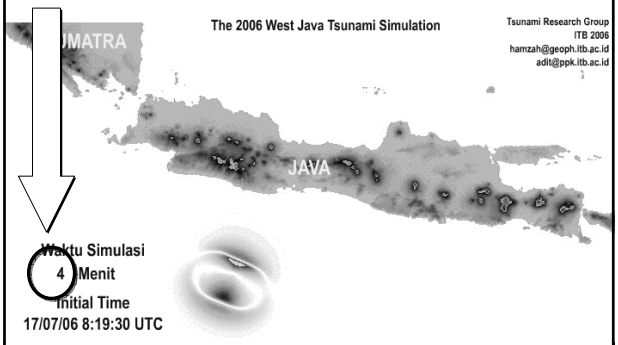
Way Ahead

- Holistic approach
- Process oriented
- Partnership based
- Expanded urban management

Information & Communication Management

Manu Gupta
SEEDS

What happened last week…..



Understanding the concept

Part :

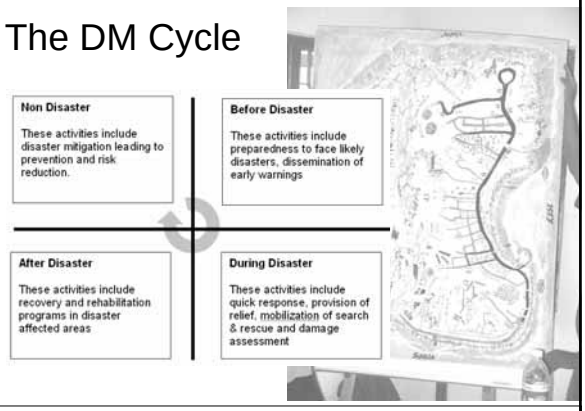
1

Understanding the issue

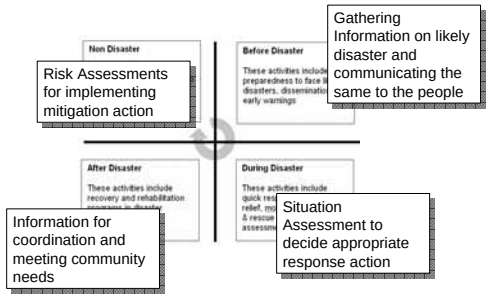
Disaster Risk Management is about taking right decisions, by the right people at the right time.

To make this happen we need to base it on a sound information and communication management system

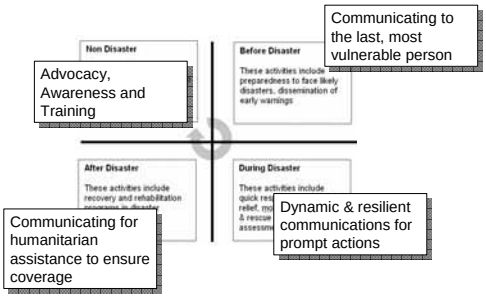
The DM Cycle



Information & Communication Management in the DM cycle



Information & Communication Management in the DM cycle



Peculiarities of Urban Areas

- Cities have several historical layers
- Cities have complex ethnic, religious, cultural and economic structures.
- Cities are often governed by multiple agencies
- Cities have high population densities, "floating population"
- Cities' physical structures makes them at highest risk to natural disasters.
- Cities have the most advanced emergency management systems, knowledge, technology and the people to respond to emergencies.

Simulations & Experiences

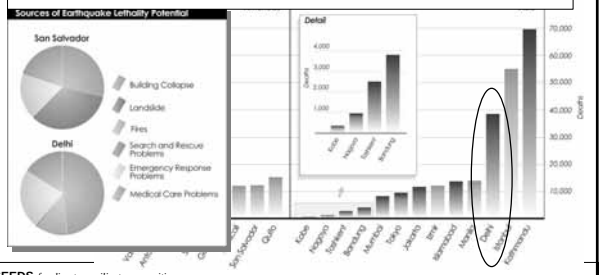
Part :

2

The Case of Delhi

Due to its immense size, 14 million people, and extremely vulnerable building stock, New Delhi, India has one of the highest total lethality potentials at over 35,000 potential lethalities.

GESI Study, 2001



New Delhi

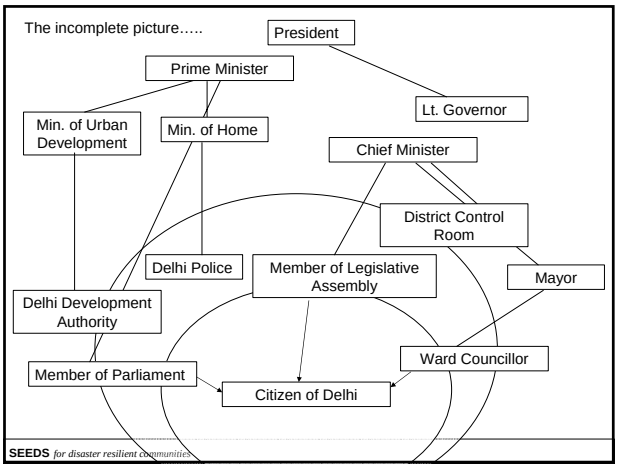
- Comprises 7 cities
- Multiple Agencies : Delhi Development Authority, Municipal Corporation of Delhi, NCR Planning Board, Delhi Government, New Delhi Municipal Committee
- 14 Million Population
- 9294 persons per sqkm
- Only 33% population in planned colonies

Communities and Communications

- Original Inhabitants : Communication is internalized, mostly informal
- Immigrants : Still relate to their places of origin, very little communication with others
- Floating Communities : No sense of belonging, no communications

Government & Communications

- Central Government
- State Government
- District Government
- Elected Representatives
- Armed Forces
- Humanitarian Organizations



Examples

- Cyclone 1999 : Relief piled up without distribution in a stadium in the capital city

- Waiting to happen : Shimla City, Seismic Zone V

- Mumbai Bomb Blasts 7/11: Mobile Networks jammed !

Tonga Failure;May 06 tsunami

A Tsunami warning was raised from Hawaii to New Zealand, but never reached Tonga…

A massive magnitude 7.8 earthquake rocked the South Pacific island of Tonga, on the May 4 2006, but a malfunction prevented international tsunami warnings from reaching the country.

New Orleans, Sept. 05

- The report to the Federal Communications Commission says, "With respect to emergency communications, Hurricane Katrina significantly hampered the functionality of these typically resilient systems. The areas in and around New Orleans were seriously impacted, due to heavier storm impact and the levee flooding. As a result, more than 2,000 police, fire and emergency medical service personnel were forced to communicate in single channel mode, radio-to-radio, utilizing only three mutual aid frequencies. This level of destruction did not extend to inland areas, which generally did not lose their communications capabilities and were soon operating at pre-Katrina capabilities. In the hardest hit areas, however, the disruption of public safety communications operability, as well as a lack of interoperability, frustrated the response effort and caused tremendous confusion among official personnel and the general public."

Where does the problem lie ?

- Knowledge Exists….is not communicated!
- Emergency Systems, Legal Systems, Rules are set……..yet citizens remain dis-empowered.
- We wait for crisis to happen
- Too many cooks…..

The way to go ?

- Establishing a participatory information system for intelligence as well as dissemination.
- Layering citizens' information with scientific information
- Applying a communications structure (Incorporating chaos management).
  - Recognizing role of Government, CSOs and citizens
- Simulation Exercises

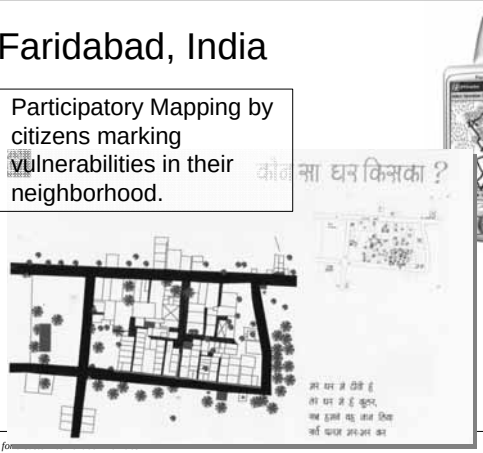
Good Practices

Part :

3

Faridabad, India

- Participatory Mapping by citizens marking vulnerabilities in their neighborhood.



Town Watching

- Citizens walk around the town observing vulnerabilities, followed by preparation of a disaster management plan

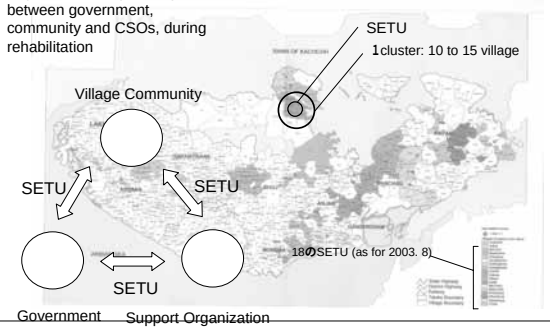
(Town Watching)

NGO Coordination Centres

- Set up after the 2004 Tsunami at District Level
- Brought Humanitarian Agencies, Government and citizens together
- Were set up in relief headquarters at district
- Operated by volunteers

SETU or "Bridge"

Gujarat : Forming a bridge between government, community and CSOs, during rehabilitation



Hazard Hunting

Pre-determined information gathering formats, both for Disaster Management Planning and for response

- Hazard Hunt Checklists
- Rapid Visual Screening Forms
- Field Relief Team Checklist

Emergency Operation Centres

- Emergency operations
- Communications and warning
- Requesting additional resources during the disaster phase from areas neighboring the affected area
- Coordinating overseas support and aid
- Issuing emergency information and instructions specific to central

Community Preparedness Drill,Gujarat

To provide Comprehensive Disaster Management Knowledge and Skills

&

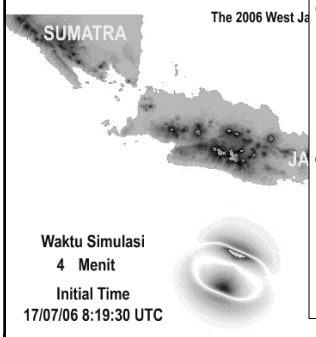
To enhance capabilities of communities to communicate during emergencies

Lessons for good information and communication management systems

Part :

4

Unto the last, and all



Gandhi's concept of

Sarvodaya

"For everyone"

&

Antodaya

"unto the last person"

Participatory

- Use of appropriate tools for involving communities at risk.
- Dynamic and resilient linkages both bottom-up and top-down
- Should be open and transparent
- Based on mutual respect
- Perceived risks vs Real risks

Effective

Have pre-determined communication protocols for emergency situations both within & outside organisations

….focus on accurate, complete and prompt communications

Organized

Based on pre-determined protocols, information must be filtered, verified, priortized and communicated to the right people

Conclusions

- Understanding FORMAL and INFORMAL communication channels among citizens.
- Past events should provide information for planning for risk management
- Multi-layered information system that is humane,….and that incorporates the chaos of a multi-polar democratic society
- Information and communication should be shared as per acceptable principles and norms in given cultural context.
- Technology is good but still unreliable

The individual citizen and his neighbor are the best disaster managers.

A sound Information and Communication Management System should be able to reinforce this strength

Thank you

www.seedsindia.org

Case study presentation

Case study of *Toyooka* by Mr. Masanori Sugimoto, City of Toyooka

Case study of *Nepal* by Mr. Jishnu Subedi, Nepal Engineering College

Case study of *Kita-Kyushu* by Mr. Hiroshi Mizoguchi, City of Kita-Kyushu

Case study of *Bangladesh* by Mr. MD.Golam Rabbani, Bangladesh Centre for Advanced Studies

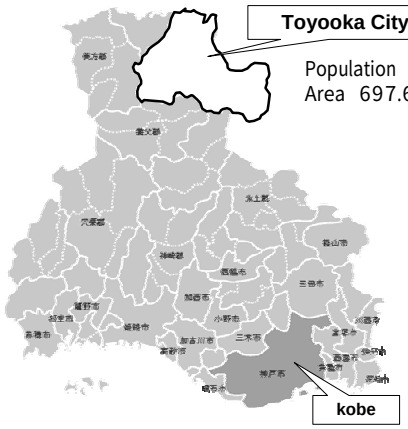
Case study of *Saijo* by Mr. Koji Ishikawa, City of Saijo

Case study of *Thailand* by Ms. Ampai Harakunarak, Thailand Environment Institute

25.7. 2006

Information and transmission at the time of 2004 Flood

Toyooka city Masanori,Sugimoto



Toyooka Basin

Beautiful and calm river

The Maruyama River

The whole area sank in the muddy water

Houses near the dike were severely damaged or destroyed

Damaged of landslides

Trees uprooted carried into the homes

Means of information and transmission to the citizens

Emergency Radio (Former one city and three town)

Cable broadcasting (Former two town)

※Receivers are installed at each house

Former Toyooka city

Receivers at each house:85% settled

Outdoor public address system:20systems

Inspection of natural disaster measures in former Toyooka City

13：00 Establishment of Toyooka Natural Disaster Caution Main Office

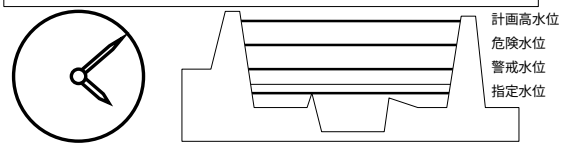
15：07 Emergency Radio (the 1st announcement)

「 Later on the water level might rise up.」

15：55 Emergency Radio (the 2nd announcement)

「Open evacuation places and transportation is suspended.」

16：10 Establishment of Toyooka Natural Disaster Main Office



16：35 Emergency Radio (the 3rd)

「Traffic Suspended」

17：15 Emergency Radio (the 4th)

「Condition of the water level of the river」

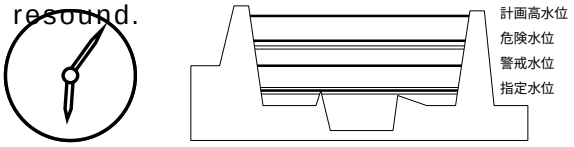
18：05 Emergency Radio (the 5th) Evacuation Notice

※Order：Calm Announcement !

The reasons：It might cause panic.

Do not miss important information.

Outdoor public address system might resound.



18：20 Emergency Radio (the 6th)

「Announcement of more evacuation places.」

18：30 Emergency Radio (the 7th)

「Re-announcement of the Evacuation Notice」

18：48 Emergency Radio (the 8th)

(Areas given the Evacuation Notice were getting wider.)

19：13 Emergency Radio (the 9th) Evacuation Order

19：24 Emergency Radio (the 10th)

(Areas given the Evacuation Order were getting wider.)

19：45 Emergency Radio (the 11th)

(Areas given the Evacuation Order were getting wider.)

23：15 The dike of the Maruyama River was broken down

23：45 Emergency Radio (the 18th)

「The dike was broken down. Escape to the upper places.」

On the 21th 3：45

Emergency Radio (the 21st) Mayor of Toyooka City Announcement

「We will do our best. Please do your best as well !」

6：50 Emergency Radio (the 24th) Mayor of Toyooka City Announcement

「We will save you.」

The Principal Problem

- Lack of supplies and machine parts
- Electric blackout
- Support for people who need back up

●To hold information with Nation and Hyogo Pref.

●Collect certain information

◎Information and transmission to the citizens

Citizens' opinion and point outs for the announcement

■Details of the announcement

○It is difficult to understand the ward

・Evacuation Notice or Evacuation order？

・Hatei?(the dike broken down)

・Which is the right side of the river?

・Dangerous water level?

Citizens' opinion and point outs for the announcement

■ Details of the announcement

○IT difficult to understand the conditions.

・It impossible to image the river conditions.

・NO concreteness

・It impossible to picture how bad the situation is.

Citizens' opinion and point outs for the announcement

■How to announce

○There is no sense of oppression. It does not spread the dangerous condition.

・Too slow

・Too calm

・It is difficult to understand it was so terrible conditions.

By all means Natural Menace will come which is over human's power or effort.

⇩

Escape !

○Prejudice of Normalization

Consciousness when the citizens heard the evacuation notice.

[NTT Docomo/Mobile Society Research Institute]

Evacuated Immediately because of danger. 20.5%

Later evacuated because of it might be danger 14.0%

Look at the condition 38.0%

It might not be danger 27.5%

Risk measures of Toyooka City (about evacuation)

○To make a hazard map

○Cable broadcasting → Emergency Radio

○Emails and fax to the citizens

◎Improvement of the way information and transmission is done

Details of information and to the citizens with Emergency Radio (result of examination)

1.Weather information

2.Flood control order and Preparation of the city

3.Establishment of Toyooka Natural Disaster Caution Main Office and Toyooka Natural Disaster Main Office

4.The operation situation of drainage pumps

Details of information and to the citizens with Emergency Radio (result of examination)

5.Traffic suspension and service cancellation

6.Rainfall and water level of the main river (the whole city)

To inform water comparing the latest level.

Add words 00m to the dike.

7.Explanation for the special words and the place where the information come from.

8.Flooding condition of the public facilities.

How to announce with Emergency Radio (result of examination)

1.Announcement as Toyooka Natural Disaster Main Office

2.Notice of emergency announcement

・In the beginning, need to say "Emergency announcement ! " and so on

3.In the beginning result or the notice of most important points

4.(important matter) decrease in selection and the reason

How to announce with Emergency Radio (result of examination)

5.Exclusion of special words

6.Use at the same time : Modulated Voice and Calm Voice

7.Positive use of emergency systems all at once

Thought on natural disaster

Local government also has its limitation

(Vision of the natural disaster plan)

Protect lives and living with everybody's power.

Town making of Toyooka City

⇩

Co-existence with nature

Reintroduction of the White Stork in Hyogo Pref.
Shows sign a rich natural land resource.

What we have learned from the natural disaster

⇩

(Expression of Mayor of Toyooka City)

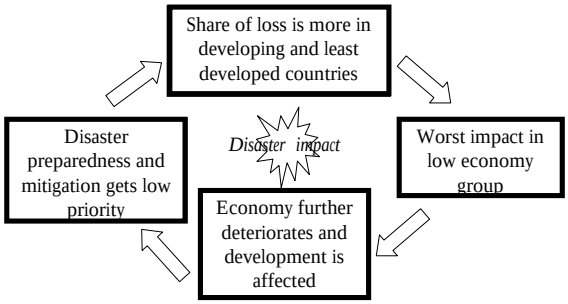
People's ties with people will save their lives.

Thank you very much

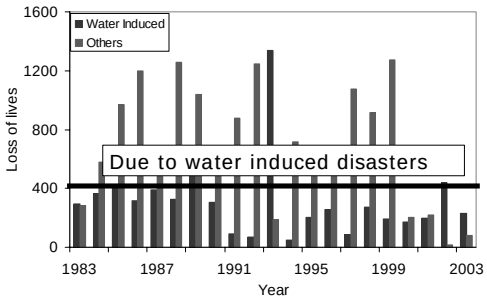
Urban Risk Management
A case Study of Kathmandu

Jishnu Subedi
Nepal Engineering College

Poverty and Disaster: Vicious Circle



Natural disasters in Nepal



Natural disasters in Nepal

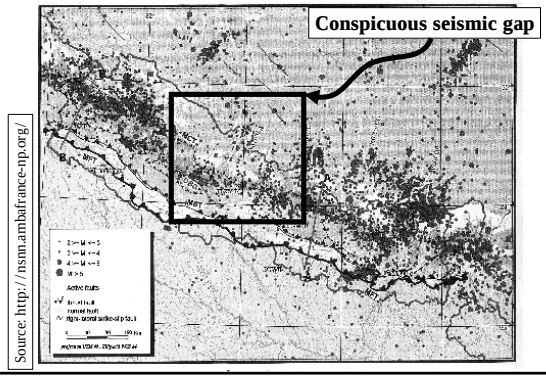
Numbers of people killed		
Disaster	**Date**	**Killed**
Earthquake	15-Jan-34	9,040
Epidemic	15-Jun-91	1,334
Flood	23-Aug-93	1,048
Epidemic	Nov-63	1,000
Flood	12-Jul-96	768
Earthquake	20-Aug-88	709
Flood	29-Sep-81	650
Epidemic	Apr-92	640
Slides	15-Jul-02	472
Flood	15-Aug-70	350

Earthquake	9040
Epidemic	1334
Flood	1043
Epidemic	1000

City Background: Kathmandu

- Valley: Kathmandu, Lalitpur, Bhaktapur
- 1.5 Million plus population
- Previous earthquakes
  - 1255 AD: One third of the population was killed
  - 1810 AD
  - 1833 AD
  - 1866 AD
  - 1934 AD: 10,000 plus death

Seismic gap

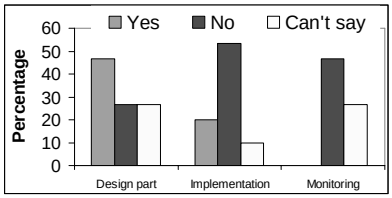


Earthquake risk: Kathmandu valley

Projection	Deaths	Injury	Building damages
1934-Eq projection	22,000	25,000	60 percent
ERMAP, 1998	40,000	95,000	60 percent
JICA, 2002	18,000	53,000	21 percent

Mitigation measures

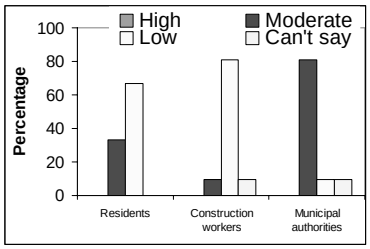
- Survey I: Among 30 engineers, architects and planners



Are you satisfied with current Design, Implementation and Monitoring practices for NBC 2004 ?

Awareness: different stakeholders

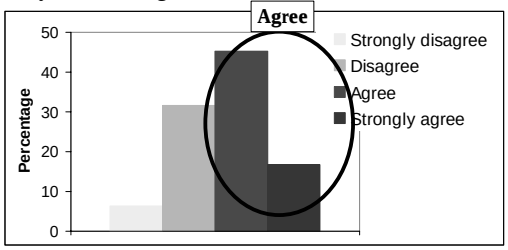
- Survey I: Among 30 engineers, architects and planners



Your evaluation of level of awareness

Awareness level of residents

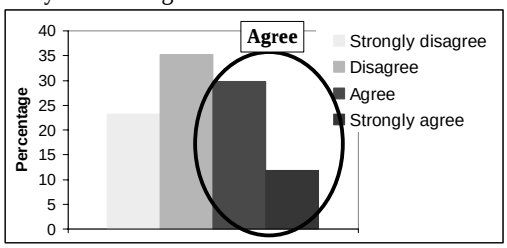
- Survey II: Among 1180 residents



I feel that large-scale natural disasters will certainly occur in next 10 years

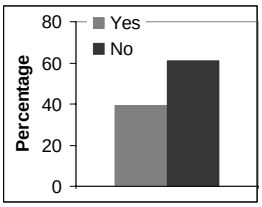
Awareness level of residents

- Survey II: Among 1180 residents

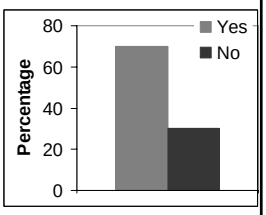


To come across a natural disaster and remain alive depends upon fate or karma

Awareness and preparedness

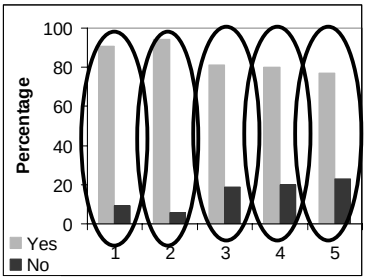


My house is well designed to withstand earthquake forces



I am aware of a safer place in case of an earthquake

Residents' survey



Do you feel insecure about

Building Collapse

Disruption of life line

Food shortage

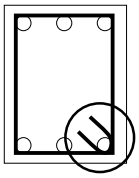
Secondary disaster

Life in shelter

NBC: Implementation part

Seismic safety gets low priority in city core and in the outskirts

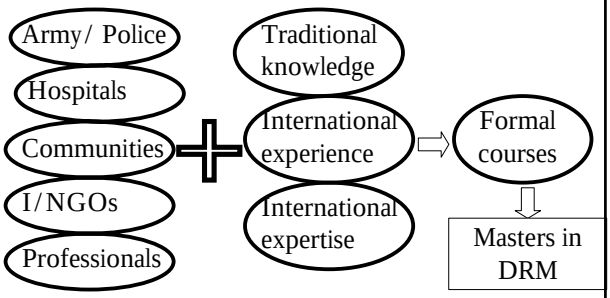
NBC: Monitoring part



Initiatives

- I/NGOs: National Society for Earthquake Technology, UNDP, Red Cross
- Institutes: Nepal Engineering College, Institute of Engineering
- Communities at risk
- Government and Municipalities
  - NBC (2004)
- Police/ Army/ Hospitals

Experience into knowledge: Formal course in DRM



Issues

- Participation of community
  - Awareness
  - Sensitization
  - Migration issues
- Integrated disaster risk management approach
- Capacity building: Engineers to Workers
- Risk/ vulnerability assessment
- Legal issues

Future strategies

- Developing culture of safety
  - Participation of communities at risk
  - 4-p (Professionals, Press, Public, Politicians)
- Training
- Institutionalizing experience: Formal courses, Research
- Replication of good practices
- Strong legal provision

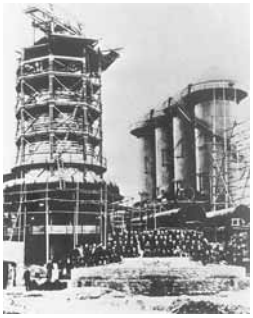
THANK YOU

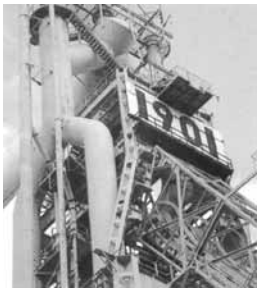
Towards "The World Capital of Sustainable Development" with a Miracle of Kitakyushu's Experience

MIZOGUCHI, Hiroshi
Director of the Office for
International Environmental Cooperation
City of Kitakyushu, Japan

1

1901

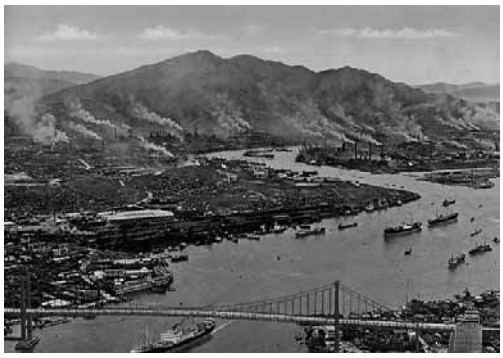




Steel Mill Began Operation

3

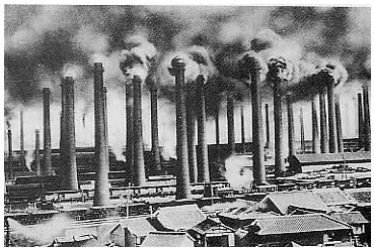
Industrial Plants Situated around Dokai Bay



4

Smoke Emitted from Chimneys

Air Pollution during 1950s-60s in Tobata, Kitakyushu



6

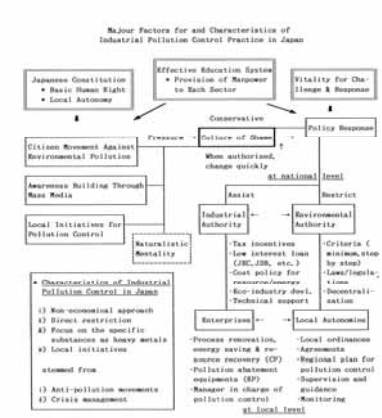
Wastewater Discharged into the Dokai Bay

A Screw Dissolved in the Bay

7

Slums along Murasaki River

8



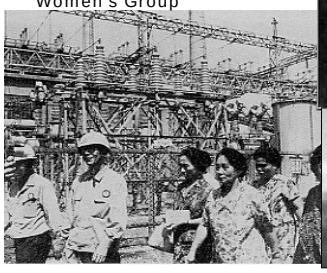
9

Major Factors and Characteristics of Industrial Pollution Control in Japan

Citizen Movements toward Environmental Pollution

Instruction by Scholars

Inspection by Women's Group



10

Produced Movies

Civic movement against environmental pollution

City of Kitakyushu

Transfer of Smog Alarming Authority

- Authority of "smog alert issuance" by Air Pollution Control Law
- In case the atmospheric condition reached at certain degree,
  - Prefectural governor may order smoke emitters to: 1) reduce quantity of the smoke; 2) limit the use of smoke generating facilities; and 3) implement required measures
- The authority was transferred from prefectural governor to the Mayor of Kitakyushu City in February 1970
- From after－the-fact countermeasures to preventive measures
  - **Special weather information system** was set up in January 1971
  - Decrease, disappear of the smog alarming

	1969	'70	'71	'72	'73	'74
Alert	12	26	1	0	0	0
Spe. Info.	-	-	34	37	23	1

Air quality monitoring center

City of Kitakyushu

Category of Local Governments

- Anglophone Type (UK, USA, etc.)
  - Small government, weak legal/financial basis
  - Strong residence autonomy, active participation of NGOs
- Francophone Type (France, Spain, etc.)
  - Centralized national government
  - A number of petty local governments
- Nordic/German Type (Germany, Sweden, etc.)
  - Bigger government and regal/financial base
  - Organization consisting of local governments is popular
  - Japanese local governments belong to this category (but, weak residence autonomy)

(by Hokkaido Local Autonomy Study Group)

13

Characteristics of Japanese Local Governments

- Triangle of citizen-councilor-administrator
- Bottom-up decision making
  - Implementation ability is quite high
  - Decision making process is slow, specifically important case is sometimes delayed
- Local feature with no individuality was made up
  - Precedential treatment, line-up tendency
  - Adjustment-style coordination
- Dependence on governments was formed
  - "Let people dependent, but not let them know" since Meiji-Era
  - Anglophone-type democracy introduced just formally since post-war era
  - Poor perception of "self-respect and independence"
  - A society not necessarily require "residence autonomy"

14

Multi-stakeholder Engagement

■"Liaison Council on Comprehensive Preliminary Industrial Pollution Study" for Hibikinada Development Plan

■"Kitakyushu Air Pollution Prevention Liaison Council"

➢Established in February 1970

➢Consists of the City, MITI, Fukuoka Prefecture, 30 companies

➢Played a major role in pollution prevention measures such as:

1) enactment of pollution control ordinance

2) establishment of alert broadcasting device

3) conclusion of pollution control agreements, etc.

■ Kyushu Regional Industrial Pollution Countermeasures Council

■Dokai Bay Seawater Pollution Prevention Measures Council, etc.

Pollution control agreements were concluded

City of Kitakyushu

Risk Management Policy

■350,000 cubic meters out of 4.8 million cubic meters of bottom sediment of Dokai Bay, containing more than 30 ppm of Hg

■Dredging work started from February 1974 until July 1975

■Total expenses: 1.8 billion JPY (71% by companies, 29% by public)

■Policy: not on cost/benefit analysis, but risk management

■A result: fish taken in the cleaned up water of Dokai Bay can now be eaten with peace of mind

Sludge dredging work at Dokai Bay

City of Kitakyushu

Expenses spent for measures against environmental pollution in Kitakyushu

(1972-1991)

City of Kitakyushu

Cleaner Production (CP)

Change: from end of pipe technology (EP) to environmentally sound production technology with low emission (CP)

(Case-1) SOx reduction in a steel works in Kitakyushu

	SOx emission	Measures	
1970	27, 575 ton/y	fuel conversion	42%
	⇩	energy/material saving	32%
1990	607 ton/y	EP equipments	25%

18

Achievements in Greening Production Process

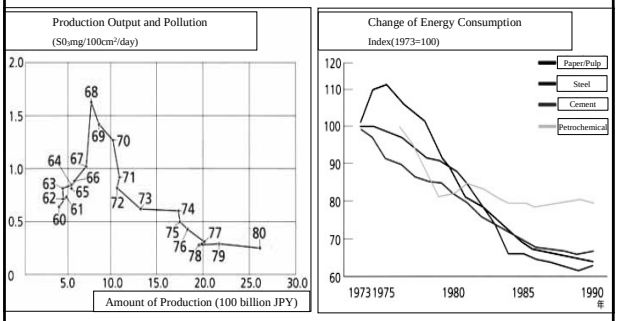
■Emission ratio per electric power generation (1980)

	Japan	Ave. of 5 advanced countries	
SOx	1.0	8.0	g/Kwh
NOx	0.69	3.5	g/Kwh

■Energy consumption per unit GDP

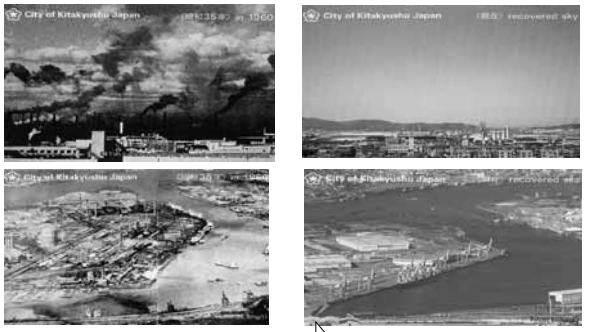
	Japan	USA	Germany	China	
1980	105	380	197	2,558	TOE/million US$
2001	92	253	130	827	TOE/million US$

Building Infrastructure for a Resource Circulating Society and Economy



Win-win Approach of Economic Activity and Environmental Conservation → **Cleaner Production**

Kitakyushu's Experience in Getting Pollution under Control - A Miracle in the World History -



1960s → *Today*

Major Factors in Getting Pollution under Control in Kitakyushu

Governmental Intervention

Multi-stakeholder Engagement

Corporate Social Responsibility

↓

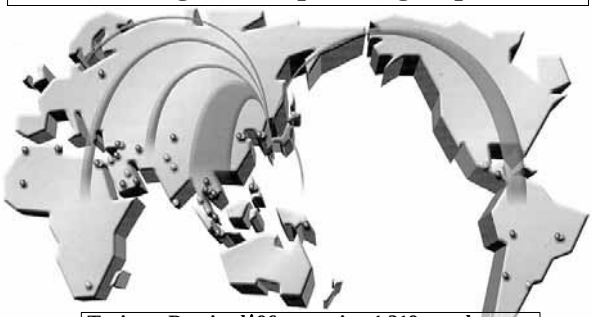
Solid Foundation for a Sustainable Society

Human Resource Development

Accumulated Know-how and Human Resources through the Experience in Getting Pollution under Control

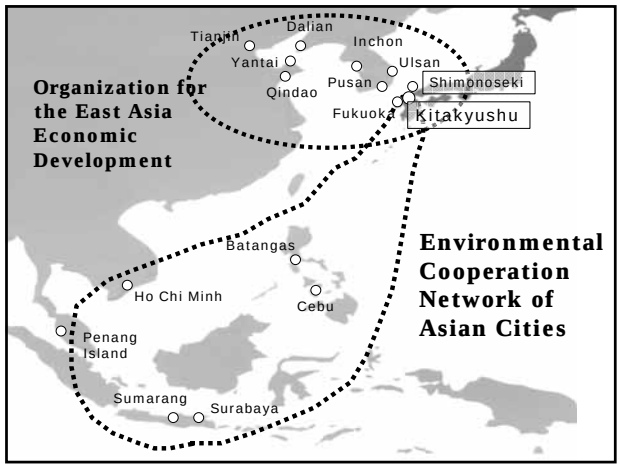
International Environmental Cooperation

Training and Dispatching Experts



Trainees Received：96 countries 1,319 people
Experts Dispatched：25 countries 98 people

25



Dalian Environmental Model District Project

A study and investigation conducted by the joint team consisted of JICA group and Kitakyushu group in order to make up with a environmental master plan for Dalian City, China.

- Duration 1996-2000
- Target To attain the environmental quality of Kitakyushu by 2010
- Contents Air pollution, water contamination, noise nuisance, waste management, environmental monitoring, city planning, etc.
- **Achievements Dalian was designated a as a city of "Japan-China Environmental Model City"**

Five loan agreements (US$ 1,150 million)

Dalian in 1994

Dalian in 2000

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Clean River Campaign in Cebu, Philippines

Media forum, attended by Kitakyushu' students

Clean river activity, participated by 400s

News paper at Cebu

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River Beautification Model Project in Semarang, Indonesia

A river in Semarang has been polluted by many Tofu industries. KITA Environmental Cooperation Center was asked to cooperate in recovering environmental quality in the river. The Project was conducted by many stake-holders, including universities, NGOs, private industries and public administration.

A river polluted by waste water from a Tofu industry

Technical instruction at a Tofu industry

Waste Problems in Surabaya, Indonesia

Waste dumping site

Surabaya

Waste analysis by Experts 32

Takakura-Method Composting in Surabaya, Indonesia

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Distance Learning Seminar on Composting

Distance lecture room in Kitakyushu

Kitakyushu～Surabaya～Bangkok 34

International Recognition

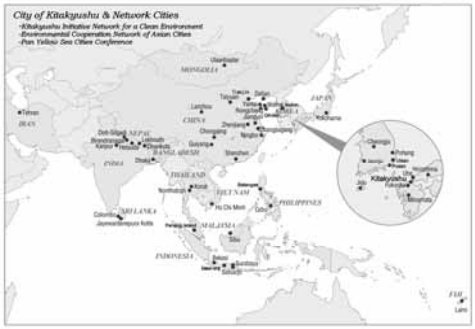
- **1990 "Global 500" Award by UNEP**
- **1992 UNCED Local Government Honours**
- **2002 Earth Summit 2002 Sustainable Development Award**

UNCED Local Government Honors
June 1992, Rio de Janeiro

UN/ESCAP's Ministerial Conference on Environment & Development

September 2000, Kitakyushu 36

Kitakyushu Initiative's Network
(62 Cities from 18 Countries)



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WSSD at Johannesburg

August 2002, Johannesburg

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Issues and Problems for Further Exploration Toward a Sustainable City

- Towards integrated improvement of the environment, economy and society
- Insufficient sharing of common ethics on the environment
  * from "dominance and monoculture" to "symbiosis and diversity"
- Urgent needs for changing consumption patterns
  * from mass-recycling to further strengthening of re-use and waste avoidance
- Enhancing social responsibility of all stakeholders for a sustainable society
  * CSRs: by not only "**c**orporate" but also "**c**ity" and "**c**itizen"

"Kitakyushu, the World Capital of Sustainable Development"

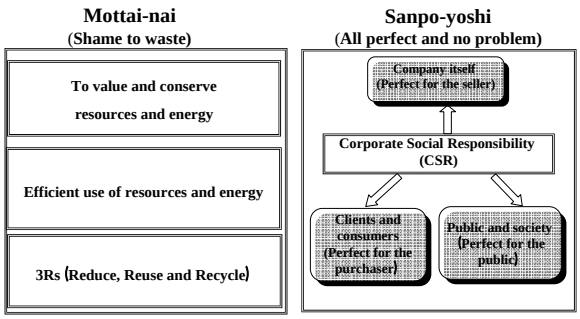
《Planning Process》 Many citizens gathered from various fields and exchanged their views and ideas enthusiastically to create a challenging environment plan, called "Kitakyushu, the World Capital of Sustainable Development."

《Basic Philosophy》 "Creation of a city with true wealth and prosperity, inherited by future generations"

What's the Environment?

- Conventional Way of Thinking
  - Environment is space and receptacle
  - Human race has a right to use every resources there free, and create prosperity
- A New Way of Thinking
  - Environment is "relation" between subject and object
  - Subject be created by object, and if subject doesn't exist, object doesn't, neither
  - Conception of "Kyosei", or Symbiosis

Revaluation and Practice of "Asian Value System"



What's the Environment Problem?

- Environment problem viewed from evolution and eco-system
  - Biological evolution and change of eco-system progress parallel
    - Assimilatory creature rose up the oxygen concentration
    - Disappearance of shallow gave birth of freshwater/terrestrial creatures
  - Inauguration of the cultural evolution
    - Birth of mankind and progress of agriculture
    - Deforestation by steel production and sailing boat building
    - Climate change by fossil fuel consumption
    - Occurrence of environmental pollution by concentrated population and urbanization
- Speed of cultural evolution>Changing speed of eco-system
  - Minor feedback appears, derived from balance-broken ecosystem-I before reaching at the new equilibrium (ecosystem-II)
  - Here shows the essence of the environment problem

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Targets set towards The World Capital of Sustainable Development

- Sharing conception of "symbiosis" among all stakeholders (social aspect)
- Exploring "green growth" (economic aspect)
  - economy and the environment favorably influence each other, and are performed together in win-win situation.
- Enhancing sustainability of the city

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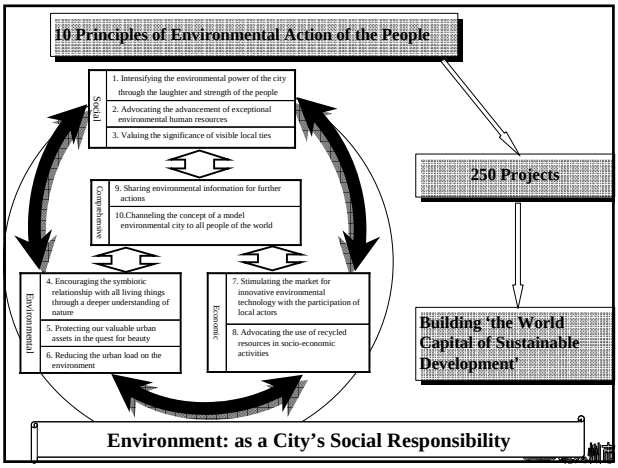

(Target-1) Sharing conception of "symbiosis" among all stakeholders

- Ten thousand citizens' forum for sustainable society
- Children's Eco-Club
- Regional currency project for eco-city development
- Eco-partner project
- Community involvement for local cleaning activities
- Promotion of community-based recycling system
- Green consumer project, etc.

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Kitakyushu Eco-Stage Projects

〜Eco-activities, citizens as main actors〜


[Opening]


[Cleaning activity]

FY	Duration	Theme	No. of projects	Participants	Challenge to the Guinness
2002	Oct. 23 〜 Nov. 4	Live in Green	30	100,000	29,917
2003	Oct. 5 〜 Oct. 28	Toward Environmental Capital	57	230,000	46,284
2004	Oct. 3 〜 Nov.14	Kitakyushu as the Env'tal capital	73	250,000	74,206
2005	Oct. 1 〜 Nov. 30	Let's start the Env'tal Capital	54	300,000	87,670※

※Number of NPO:160

Applied to the Guinness Book of Records

(Target-2) Exploring "green growth"

- Further development of Eco-Town project
- Industry-academia collaboration for joint research
  - * bio-sensing, biological production, eco-design, etc.
- Promotion of eco-products and eco-tour
- R/D on fossil-fuel free energy development
- Promotion of eco-venture business
- Environmentally sound management of small/medium sized companies, etc.

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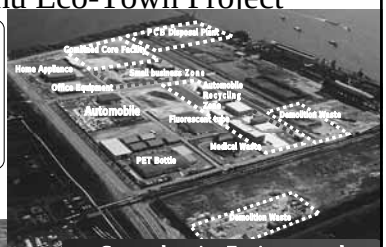
Kitakyushu Eco-Town Project

- Investment: 50Billion
  (Private:64%, Public: 36%)
- Employee: 1,200
- Visitor: 400,000



Practical Research Area

Comprehensive Environmental Industrial Complex

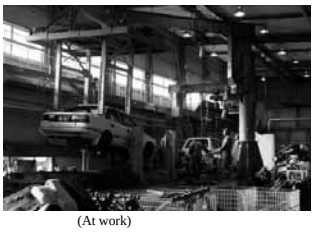
"Zero Emission Complex"
By Material & Thermal Recycling

Plastic PET bottle recycling plant

- According to the "Containers and Packaging Recycling Law", PET bottles separately collected by municipalities are recycled to produce recycled PET resin that is used as raw material for fiber
- Project leader: Nishinihon PET-Bottle Recycle Co., Ltd. (invested by Nippon Steel Corp., Mitsui & Co., Ltd., Nippon Steel Transportation Co., Ltd., Nippon Express Co., Ltd., Sankyu Co., Ltd. and the City of Kitakyushu)
- Operation commenced in July, 1998
- Processing capacity of approx. 18,000 tons/year
- Project with eco town subsidies of the Ministry of International Trade and Industry

Used automobile recycling plant

(Plant)



(At work)

- Used cars are recycled with an improvement in the recycling rate and the promotion of proper treatment of oils and CFCs, producing quality scrap by advanced technology of dismantling and separation.
- Project leader: West Japan Auto Recycle Co., Ltd. (invested by Yoshikawa Kogyo Co., Ltd., Mitsui & Co., Ltd., Nippon Steel Corp., Nippon Steel Transportation Co., Ltd., Kyushu Metal Industry Company)
- Operation commenced in February 2000
- Processing capacity of 18,000 cars/year
- Project with eco-town subsidies of the Ministry of International Trade and Industry

Home appliance recycling plant

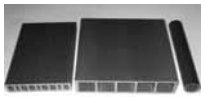
(Plant)

(At work)

- TV sets, refrigerators, washing machines, air-conditioners, and freezers are dismantled and separated to producing quality recycled raw materials.
- Operation commenced in April 2000
- Processing capacity of approx. 700,000 per year
- Project with the eco-town subsidies

Waste Wood & Plastic Recycling Plant

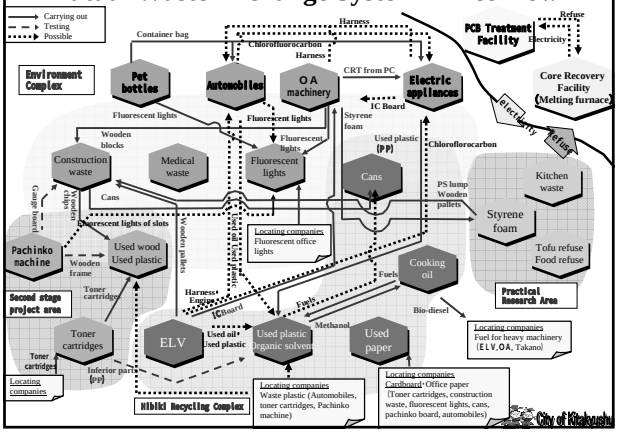
[plant]



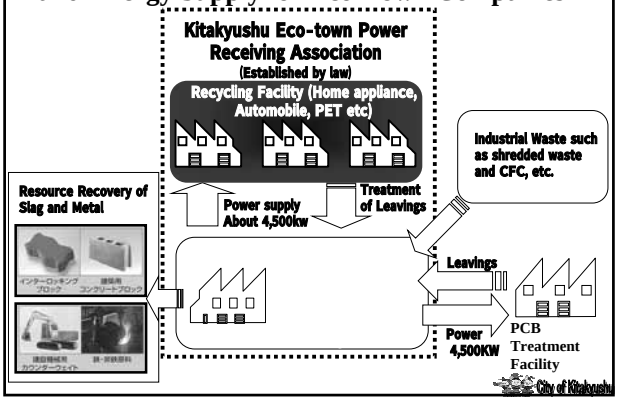
[products]

- Scrap wood and waste plastic are mixed, producing waterproof and weatherproof materials.
- Operation commenced in May 2003
- Processing capacity of 5,000 tons/year
- Project with eco town subsidies

Mutual Waste Exchange System in Eco-Town



Integrated Melting Furnace of Final Disposal and Energy Supply for Eco-Town Companies



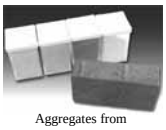
Major Factors Why Many Recycling Industries Constructed in Kitakyushu

①Existence of competent engineers and an accumulation of environmental industrial technology
②Existence of a vast industrial site
③Geographic location as a distribution base
④Achievement and succession of collaborative activities by multi-stakeholders
⑤Disclosure of information including risks and interactive communication with citizens
⑥Efficient governmental intervention through regulations, financial assistance and guidance

Kitakyushu Eco-Products


Recycled fluorescent tube

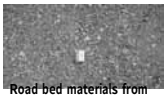

Toner cartridge for reuse


Aggregates from Styrene foam


Construction materials from Waste wood/plastic


Livestock litter from used paper


Recycled organic solvent


Road bed materials from Demolition wastes


Steel pellet from waste can


Diesel fuel recycled from waste cooking-oil

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(Target-3) Enhancing sustainability of the city

- Renewable energy development
- Urban energy shape-up project
- Treated sewage utilization
- Biotope network
- Regional consumption of agricultural produce
- Biomass composting
- Permeable pedestrian for rain water storage
- Greening of roof-top and walls
- Waste avoidance, and further promotion of reuse and recycling by at-source separation
- Green village project, recycling port project, etc.

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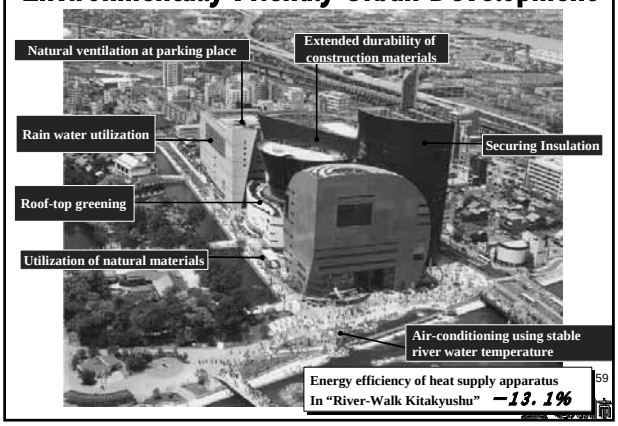
Environmentally Friendly Urban Development



Energy efficiency of heat supply apparatus In "River-Walk Kitakyushu" −13.1%

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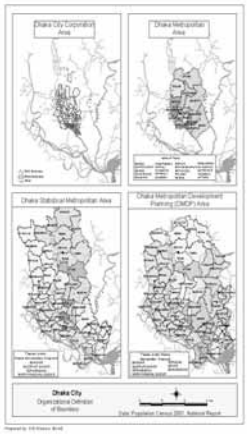
Urban Risk Management
Dhaka Case study

27 July 2006
Kyoto, Japan

MD. Golam Rabbani
Bangladesh Centre for Advanced Studies

Definition of Dhaka City: Based on Area

- Dhaka City Corporation (DCC): 276 km^2
- Dhaka Metropolitan Area (DMA) : 360 km^2
- Dhaka Statistical Metropolitan Area (DSMA): **1353** km^2
- Rajdhani Unnayan Kotripakkha (RAJUK): **1530** km^2



History of Dhaka Mega City Area and Population

Year	Area (Sq. Km)	Population	% Increase of population over the preceding year	Density (Per Sq. Km.)
1951	85.45	411,279		4813.09
1961	124.45	718,766	74.76	5775.54
1974	335.79	2,068,353	187.76	6159.66
1981	509.62	3,440,147	66.32	6750.41
1991	1352.82	6,844,131	98.95	5059.16
2001	1352.82	10,712,206	56.51	7918.43

Source: DCC, 2004

KEY ISSUES

- ❑ Air Pollution
- ❑ Surface Water Contamination
- ❑ Groundwater Declination
- ❑ Solid Waste Management
- ❑ Sewage Management
- ❑ Noise Hazards
- ❑ Land use violation
- ❑ Water Logging/Drainage Congestion
- ❑ Transport Congestion
- ❑ Slums and Squatters
- ❑ Natural Disaster (Flood)
- ❑ Others

(fires, disease outbreaks, building collapse, immoral demonstration of the political parties, terrorism, mugging/robbery etc)

Air Pollution

Concentration of criteria air pollutants in the ambient air of Dhaka city (from Jan 2003 to Dec 2003)

- SPM_{10}: minimum 32 and maximum 526 micrograms per cubic meter (BDS 150 micrograms per cubic meter)
- $SPM_{2.5}$: minimum 14 and maximum 405 micrograms per cubic meter (BDS 65 micrograms per cubic meter)

NO_x : minimum 4.7 and maximum 650 ppb (BDS 53 ppb)

O_3 : minimum 6 and maximum 299 ppb (BDS 120 ppb)

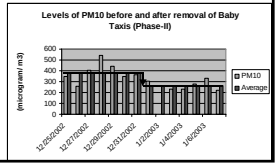
(Air Quality Management Project, DoE, 2004)

Location	Dilu Road Slum SPM (microgram / m^3)	Rayer Bazar Slum SPM (microgram / m^3)
Kitchen	5092	4445
Kitchen	4545	10910
Kitchen	5253	4440
Kitchen	4040	18586

WHO, 2002

Response to Air Pollution

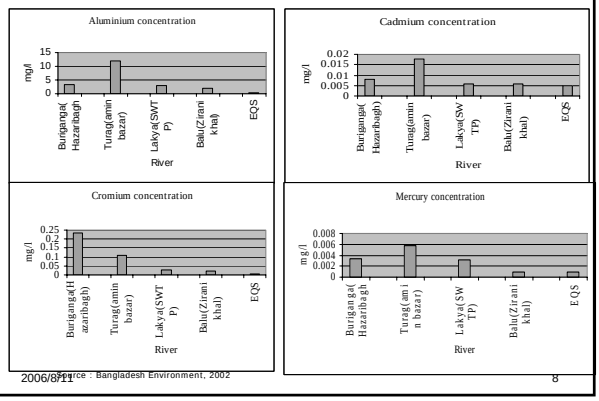
- *Introduction of Compressed Natural Gas (CNG) vehicle which has tremendously helped reduce the air pollution of Dhaka city*
- *Introduction of unleaded gasoline from 1st July of 1999*
- *Notification of lubricant standards on 1st January, 2001*
- *Banning of buses older than 20 years and trucks older than 25 years in Bangladesh from 2002*
- *Banning of two-stroke engined three wheeler vehicles from 1st January, 2003*
- *Banning of imported reconditioned cars older than 5 years*
- *Reduction of number of NMVs (Non-Motorized Vehicles) and by restriction of movement of such vehicles within certain areas of the city and during specific periods of the day.*
- *Banning of operation of commercial trucks in Dhaka city during day time (8 am to 10 pm)*
- *AQMP started in 2001*



Surface Water Contamination

- Disposal of untreated sewage
- Industrial solid and chemical waste
- Solid waste disposal
- Accidental dumping of petroleum products during load and unload

Surface Water Contamination



Source : Bangladesh Environment, 2002

Surface Water Contamination

The major water related policies and acts includes
- National Water Management Plan 2004,
- Bangladesh Water Development Board Act 2000,
- Urban Water Body Protection Law 2001,
- National Water Policy, 1999,
- Water Resources Planning Act 1992.

Recently, the government has decided to relocate the tannery industries, the major source of surrounding river pollution from Hazaribagh to Savar, 30 km away from the city.

WASA is trying to mobilize funds for improving sewage management of the city.

Groundwater Declination

- More than 80 % of the water consumption per day comes from groundwater sources
- About 1100 DTWs (public and private) regularly extract groundwater
- Surface development, reduced open space, encroachment of land and water bodies etc may lead to low rate of recharge

Year	Depletion (Meter)
1996	26.6
1997	28.15
1998	30.45
1999	31.86
2000	34.18
2001	37.78
2002	41.87
2003	46.24

DoE, 2005

Solid Waste Management

Hazaribagh Temporary landfill site

Matuail Landfill site

Year	Solid Waste Generation (Tons/day)	Total capacity of Disposal (Tons/day)	Uncollected waste (Tons/day)
1998	3,944	1,576	2,368
2000	4,750	2,350	2,400
2002	4,900	2,400	2,500
2005	5,000	2,500	2,500

DCC, 2004; BCAS, 1998; JICA, 2004; Waste Concern, 2004;

Solid Waste Management

Year	Solid Waste Generation (Tons/day)	Total capacity of Disposal (Tons/day)	Uncollected waste (Tons/day)
1998	3,944	1,576	2,368
2000	4,750	2,350	2,400
2002	4,900	2,400	2,500
2005	5,000	2,500	2,500

Response to Solid Waste Management

- The DCC has recently established a Solid Waste Coordination Cell to improve the present management and system of collection.
- A pilot project was initiated in Rampura (Ward-22) to create awareness among the people regarding proper management of solid waste of Dhaka city through stakeholder participation.
- The government banned polythene bags in January 2002, which has reduced the solid waste generation in the city.
- The government realizing the solid waste related problems approved a number of CBOs, NGOs and private organization in waste collection, disposal and recycle.
- Waste Concern started waste recycling plants in four different wards in Dhaka. The capacity of these plants is 15 tons/day
- BCAS and Waste Concern is on the process to establish "waste to energy" plant

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Solid Waste Management

- JICA, BCAS, Waste Concern and some other organizations have conducted study on solid waste management of Dhaka city
- BCAS has initiated awareness programmes among medical professionals on medical waste management

Solid Waste Management Master Plan by JICA

JICA had prepared a Solid Waste Management Master Plan for Dhaka City Corporation in 2005. The Master Plan highlights the current status of solid waste management, solid waste associated problems, analysis of cost and benefits, institutional arrangement, and financial aspects etc. The Master Plan identified a number of programmes to improve the situation. Of them, four have been extracted to implement between April 2005 to March 2006. These are Participatory SWM Programme, Capacity Building of Collection/Transportation Programme, Final Disposal Site Improvement Programme, Solid Waste Administration and Management Improvement Program

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Sewage Management

- More than 1.3 million m^3 of sewage
- Only 0.10 million m^3 gets treated
- Only 30 % population have access to sewerage service

Year	Sewer line (km)	Sewer connection (Nos.)	Approx. Sewage generation (m^3)	Sewerage system coverage area (%)	Capacity of treatment (m^3)	Actual treatment (m^3)	Lack of proper treatment (m^3)
1998	640	44,000	0.90 million	15	0.12	0.10 million	0.8 million
2003/ June	779	48,777	1.20 million	30	0.12	0.05 million	1.15 million
2004/ June	786	49,707	1.30 million+	30+	0.12	0.05 million	1.25 million

Source: *WASA, 2003; WASA, 2004; The New Age, 16 April and personal communication*

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Sewage Management

- The government and the international organizations (for example World Bank, Asian Development Bank, Japan International Cooperation Agency) have taken several initiatives for improving the sanitation services in Dhaka city
- The World Bank completed a feasibility study on improved sanitation services in South Dhaka in 1996 as part of 4th Dhaka Water Supply Project
- JICA has completed a study on North Dhaka Sewerage System. JICA said this part need at least 3 sewage treatment plants with relevant capacity to treat the existing generated wastewater.

Noise Hazards

- Vehicular horns and movements
- Industrial Operation
- Construction and repairing activities
- Informal settlements (e.g. shouting, screaming etc)
- Use of loud speakers, microphones and mikes
- Poor road surface

Location	**1999** (dB)	**2002** (dB)	**Standard Limit for Bangladesh** (dB) **Day-Time**
Silent Area	64.8	64.9	50
Residential Area	70.5	64.9	55
Mix Area	84.3	81.6	60
Commercial Area	86.5	84.0	70
Industrial Area	85.6	83.0	75

(WHO, 2003)

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Response to Noise Hazards

- Recently the government has taken some action to control noise level in the city.
- Formulation of Noise Control Rules, 2004.
- Banning vehicular hydraulic horns.
- Monitoring mechanism at the main traffic points to determine whether the vehicles follow the orders or not.
- Removal of 4000 nos. of hydraulic horns by the DMP from the vehicles plying on the city street

(WHO, 2003)

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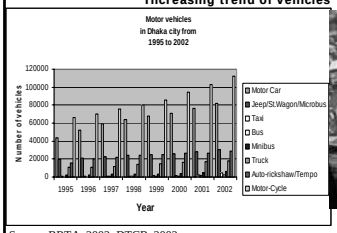
Land use violation

- 30% people of this city share 80% of the total residential area and the rest 70% of the people share only 20% of residential area (Islam, 1996)
- Nearly 3000 slums and squatter settlements occupied the city land
- Land encroachment by local musclemen

Water Logging/Drainage Congestion

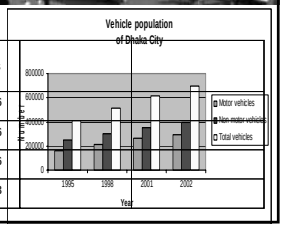
- Rainfall causes water logging in most of the areas of Dhaka city
- Inadequate storm water sewer infrastructure

Transport Congestion
Increasing trend of vehicles from 1995 to 2002



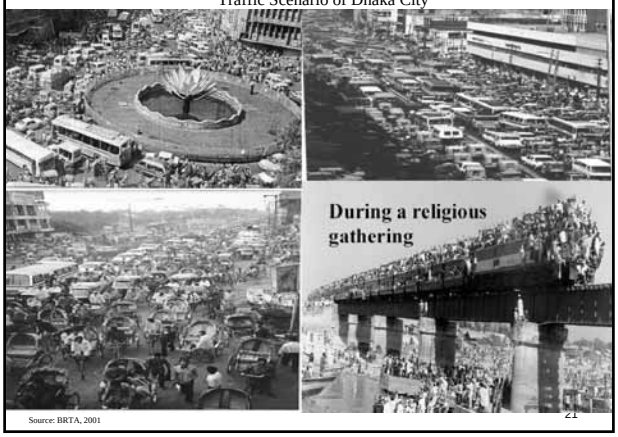
Source: BRTA, 2002; DTCB, 2002

Year	Motor vehicles	Non-motor vehicles	Total vehicles
1995	161,956	250,000	411,956
1998	214,536	300,000	514,536
2001	266,906	350,000	616,906
2002	293,873	400,000	693,873



Source: BRTA in DTCB, 2002; JICA, 2000; Banglapedia, 2003

Traffic Scenario of Dhaka City



Source: BRTA, 2001

Response to transport congestion

Banning of buses older than 20 years and trucks older than 25 years in Bangladesh from 2002

- Banning of two-stroke engined three wheeler vehicles from 1st January, 2003
- Banning of imported reconditioned cars older than 5 years
- Reduction of number of NMVs (Non-Motorized Vehicles) and by restriction of movement of such vehicles within certain areas of the city and during specific periods of the day.
- Banning of operation of commercial trucks in Dhaka city during day time (8 am to 10 pm)
- Dhaka Integrated Transport Study (DITS) conducted during 1991-1992 to determine the transport status of Dhaka
- Dhaka Tranport Transport Coordination Board (DTCB) established in 2001 to develop an inniovative transport policy and guidelines for the improvement of transport status of Dhaka city : sTP 2000-2020

slums and squatters

- Nearly 3000 Slums and squatters accommodate the low-income group of people
- Most of them work in garment industries
- only 9% of thie total population manages to get solid waste management services
- Inadequate access to safe drinking water.
- Biomass fuel burning
- some of them are involved with illegal activities

- DCC has installed 230 sanitary toilets, 42 tube wells, 9 water reserves and 8 biogas plant in different
- slums areas (DCC, 2004).
- Dustho Shastho Kendro (DSK) has constructed 75 water points to serve the slum dwellers in Dhaka city
- Water Aid is also providing water for slum dwellers in Dhaka city
- Plan International has installed 17 biogas plants in different slum areas of Dhaka city for better sanitation
- Proshika has provided community latrines in slums of Demra
- Concern has also provided community latrines for slum dwellers.

Natural Disaster(Flood)

- Overflow of surrounding river system
- Sewage runoff
- Inefficient solid waste management
- Shutdown industrial and business operation
- Communication hazard
- Supply water crisis
- Closing academic institutions
- Quality food crisis

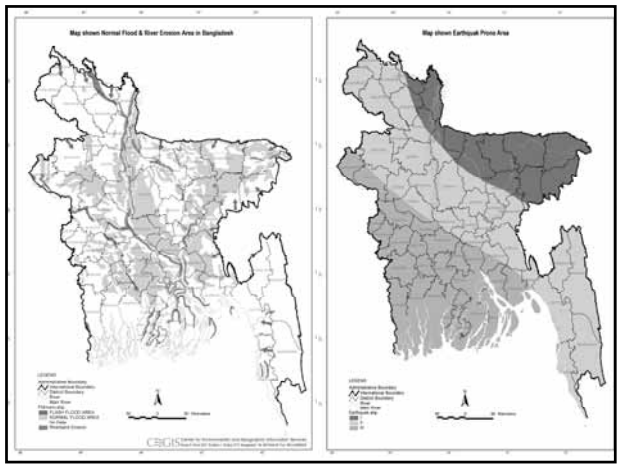
Dhaa city experienced heavy floods at least 9 times from 1954 to 2004

Source: The Daily Star, 2004

Response to Natural Disaster(Flood)

•The GOB established Flood Forecasting and Warning Centre to reduce the damages and create awareness among the people about the flood situation

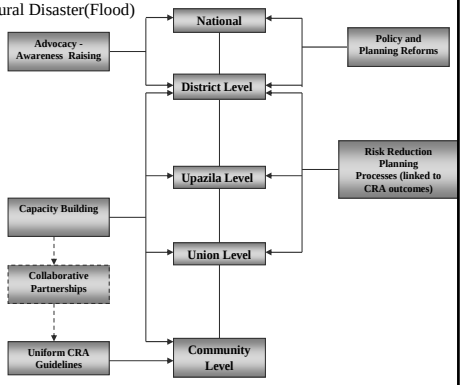
• WHO, UNDP, UNICEF, CARE, WATER AID, JICA and many other organizations directly contributed to the flood succor in affected areas, taking part in relief, health care services and providing water supply all over the affected areas of the city



Response to Natural Disaster(Flood)

• SODM

• CDMP



Mainstreaming Strategies

27

others

- Fires in the commercial establishments and slums,
- disease outbreaks (diarrhoea, dengue fever etc)
- Building collapse
- Immoral demonstration of the political parties,
- Mugging/robbery, etc

28

Some Lessons

1. Enforcement: Banning of 2 stroke 3 wheelers vehicles and introduction of Compressed Natural Gas (CNG) which has tremendously helped reduce the air pollution of Dhaka city

2. Solid Waste Management in Urban Areas

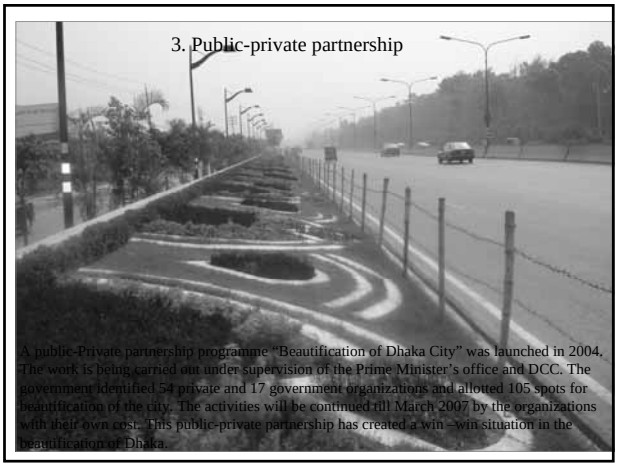
Project Areas: City including Dhaka, Towns and municipal areas
Beneficiaries: *Urban poor, informal sector involved in waste recycling, low and middle income communities, private sectors and the farmers.*

Implementing Agency: Ministry of Environment and Forest
Sub-Implementing Agency: Waste Concern

Activities
Waste Concern started a community-based composting project in 1995 to promote the concept of '4Rs' – reduce, reuse, recycle, and recovery of waste – in urban areas of Bangladesh. It is based on the idea that the organic content of Dhaka's household waste, which accounts for more than 70% of total waste, can be efficiently converted into valuable compost/ soil enricher with the help of simple and low-cost aerobic composting technology.
Lessons learnt:
Efforts should be made to develop innovative techniques suitable for local condition, such as preparing compost and supply to the companies who need it.
Marketing of the compost was an important feature of this project for its sustainability.
Resource recovery from waste does not always need expensive centralized mechanical plant.
Waste can be managed and recycled in partnership with community groups in decentralized plants, using low cost and labor intensive techniques;

29

3. Public-private partnership



A public-Private partnership programme "Beautification of Dhaka City" was launched in 2004. The work is being carried out under supervision of the Prime Minister's office and DCC. The government identified 54 private and 17 government organizations and allotted 105 spots for beautification of the city. The activities will be continued till March 2007 by the organizations with their own cost. This public-private partnership has created a win –win situation in the beautification of Dhaka.

2. Solid Waste Management in Urban Areas

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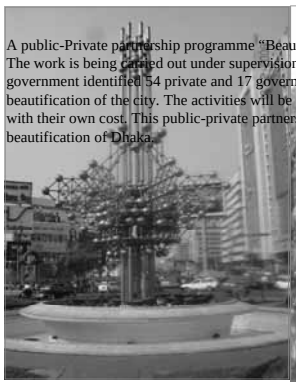
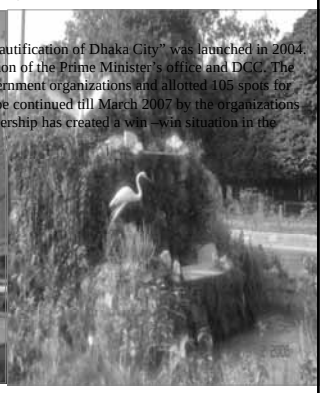




31

Thank You

32

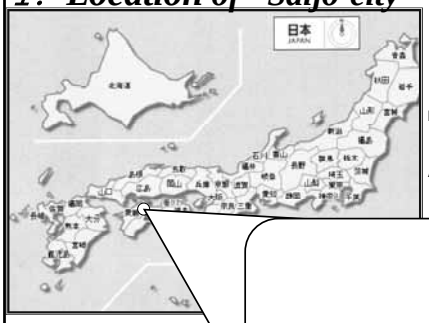
"The Saijo-city practice disaster prevention plan" to make the system which can deal with a disaster

2006. 7. 28

Saijo-city A citizen's safe department

Crisis management section koji-ishikawa

1. Location of "Saijo-city"



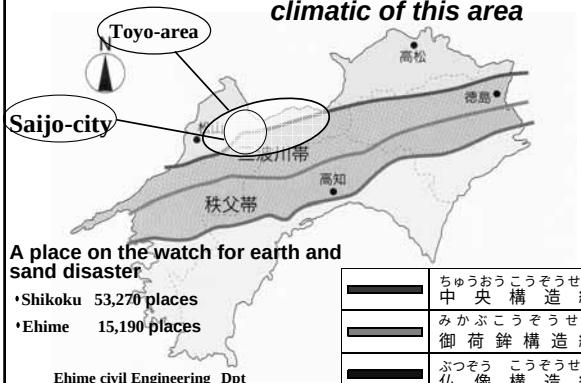
"saijo-city"

Population:
About 116,000

An area:
About 509 ㎢

Saijo-city, Ehime

2. The topography, geology, and climatic of this area



A place on the watch for earth and sand disaster

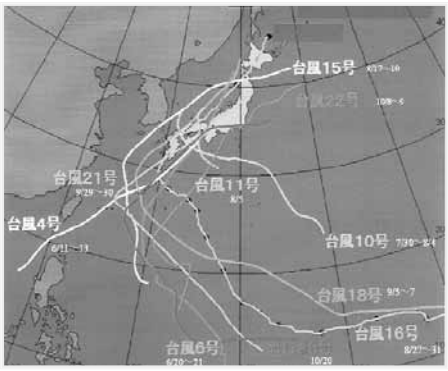
- Shikoku 53,270 places
- Ehime 15,190 places

	ちゅうおうこうぞうせん 中央構造線
	みかぶこうぞうせん 御荷鉾構造線
	ぶつぞうこうぞうせん 仏像構造線

Ehime civil Engineering Dpt

3. About a 2004 typhoon disaster

① *The typhoon course figure which brought the damage in Shikoku*



The typhoon that struck Japan
10 typhoons

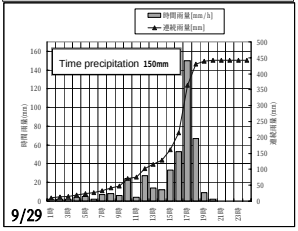
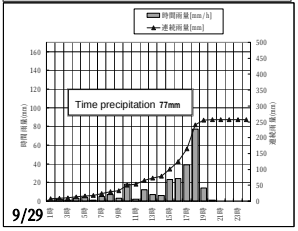
The typhoon that struck the, Shikoku
6 typhoons
"Observation in history most numbers"

334 places of earth and sand disasters occurred in Ehime

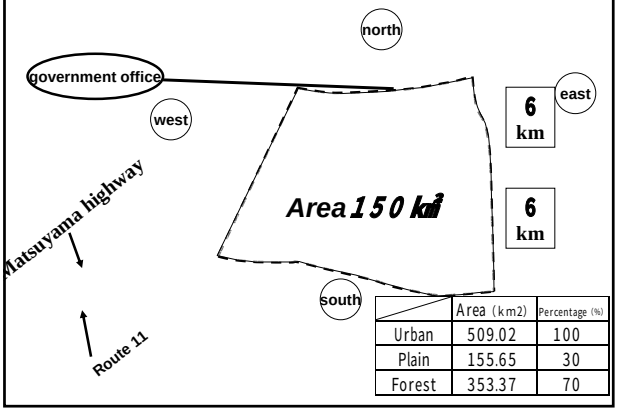
A dead person
- Ehime: 17 people
- In Saijo-city: 5 people

②. The situation of the rain

- **2004.9.29～2004.9.30** A heavy rain by typhoon 21
- **Kurose Dam observatory 150mm／h**
  (The 24 hours rainfall **431㎜**)

Kurose Dam observatory	Saijo observatory
	

③. Affected Area by a typhoon of 2004



	Area (km2)	Percentage (%)
Urban	509.02	100
Plain	155.65	30
Forest	353.37	70

4. The damage by typhoon 21

① Road interception by a landslide

It was in a situation that local inhabitants cannot but cope with oneself till there was the area that stood alone temporarily, and rescue help from the outside came.

② Blockage of a river by driftwood

- At a middle-class level, a fallen tree and the left forest materials flowed into a river and it was full of supporting beams and caused the inundation damage.
- It is important to do appropriate instructions so that it promotes voluntary disaster prevention activity from a day, and local inhabitants can take refuge safely by recognizing danger of a disaster.

③ Being washed away of a bridge

Kawasaki-bridge

⇦ before

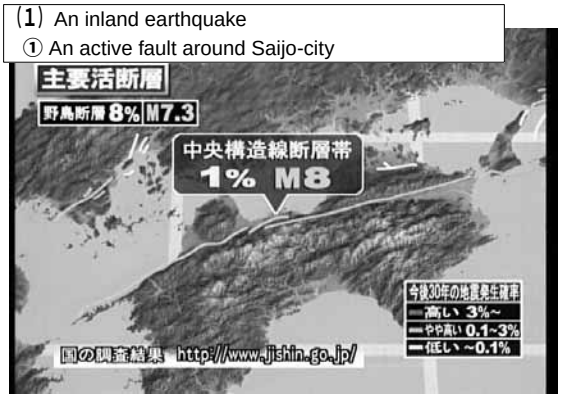
after ⇩

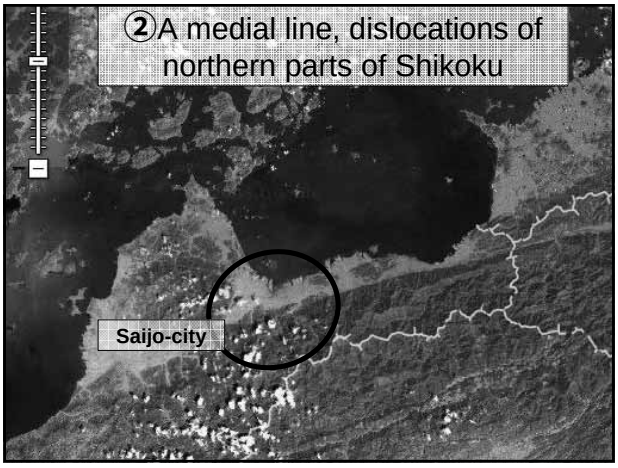
妙之谷川　国道より約 260m上流　左岸より町道川崎橋落橋後状況

5. Danger of an earthquake disaster

(1) An inland earthquake

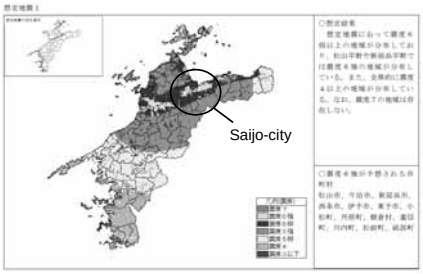
① An active fault around Saijo-city





③ Ehime earthquake damage assumption result

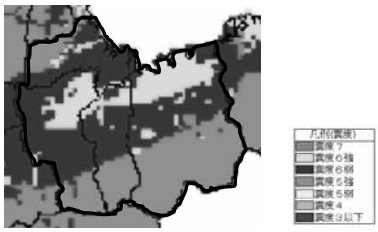
(Damage expectation of an earthquake by Kawakami/Komatsu dislocation)



In Saijo-city, seismic intensity a little over 6 is expected in the place where rolling is the biggest.

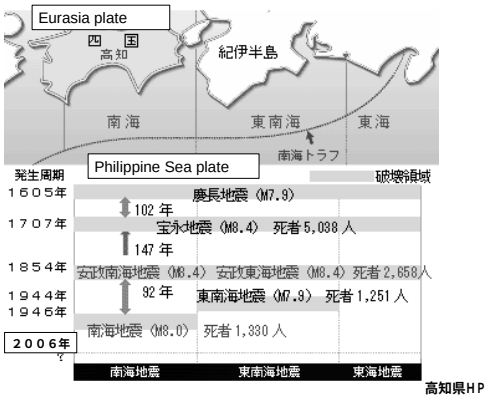
④ Damage expectation of Saijo-city

(Damage expectation of an earthquake by Kawakami/Komatsu dislocation)



North part of Former Saijo,Komatsu,Tanbara is estimated to have large earthquake

(2) The southeast sea / south seas Earthquake



高知県HP

6．Upbringing of a voluntary disaster prevention organization

(1) An action of voluntary disaster prevention organization upbringing

・**西条市自主防災組織推進要綱** (H16.11.1 **制定：合併時**)

・**西条市自主防災組織に対する防災資機材貸与要綱** (H17.4.1**制定**)

・**27地区公民館で自主防災組織・実践防災計画の説明会実施**

(H18.1**～3月、**27**地区**1,147**名参加**)

・**単位自治会での説明会** (H17**年度**22**回**)

（2） The organization situation of a current voluntary disaster prevention organization

- **As of 1st July 2006**
- **Community Based Disaster Management**
- **% of organizing: 32.0%**

(3) Practice of a voluntary disaster prevention organization

Maintenance of a body system

①The making of agreement

②Enforcement of premeditated activity

③Cooperate with administration

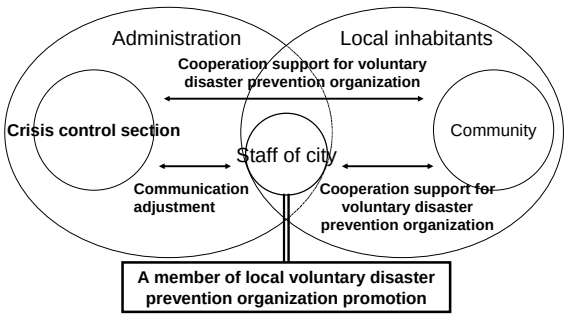
Saijo-city is venting out a disaster prevention tools (about 300,000 yen)

集会所を共同で利用している場合は、共同(連合組織)で組織化する。

(2006 Budget 15million yen)

Loan of a disaster prevention tool

(4) An image of voluntary disaster prevention organization organization



I aim at voluntary disaster prevention organization organization in a whole city in 2008

7. **“Saijo-city practice disaster prevention plan”**

京都大学小林正美教授、ラジブ・ショウ助教授の指導の元、市内住民に危機管理に対する意識の向上と、市職員の防災意識確立を図り、地域防災力の向上を図る。

(1) Disaster prevention network construction of a citizen and a city

27地区公民館で自主防災組織・実践防災計画の説明会実施

(2) Map training of disaster

土砂災害等の危険性の高い山際の30自治会に対して、9回 (337名参加) に分けてワークショップを開催し災害図上訓練を実施した。

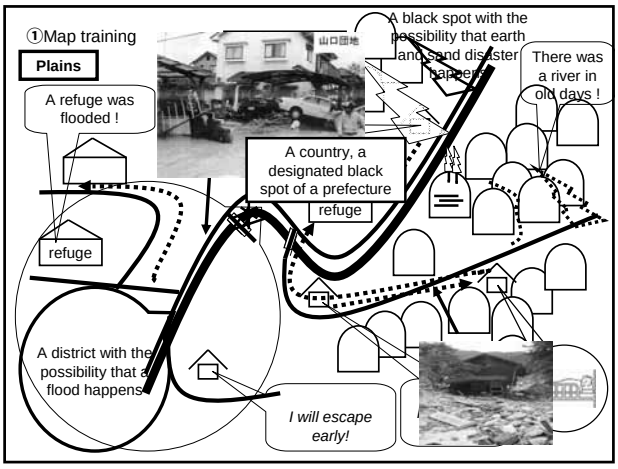
災害図上訓練を元に危険箇所、避難場所、避難経路、啓発情報等を掲載した「コミュニティハザードマップ」を作成する。

(3) Enforcement of questionnaire listening comprehension investigation

ワークショップを実施する地区に対してアンケート調査を実施した。

(4) A design to protect residents

山林を災害に強い森にするため、山林倒木、間伐材を活用した産業育成、山と木の調査、木の循環型都市について検討する。



1. Where is a dangerous point / district?

① A black spot of a country / prefecture appointment

② The place where a disaster occurred in 2004

③ A place to think to be dangerous

2. How are local weak people protected

① Where are you?

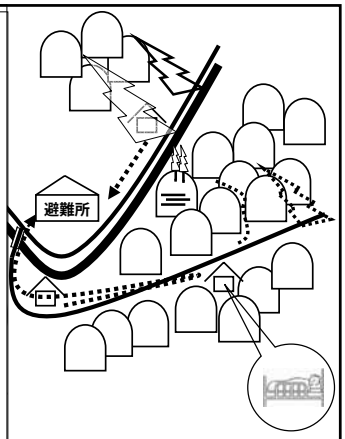
② Who protects them?

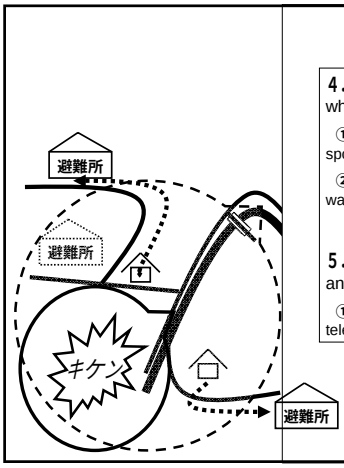
3. How was the area in old days?

① Where were a river or a pond in old days?

② Is there a place where a disaster occurred in old days?

I wrote these down in the chart





4. Where do you run away to by which course?

① Where is the nearest safe refuge spot?

② What is the shortest and safest way to the spot?

5. What should we do to inform an the residents of the disaster?

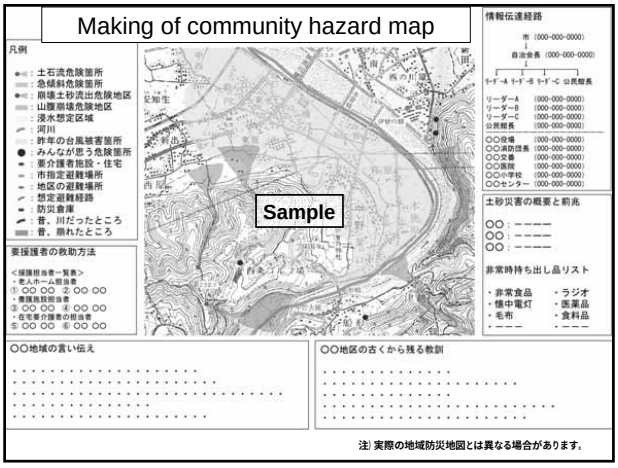
① What should we do in case of telephone trouble?

Workshop (DIG)

災害図上訓練実施地区

災害図上訓練結果図

Making of community hazard map



Disaster prevention to join by the past / the future

- I know a past

I know an old disaster nidus, a history of a river / a pond.

- I act and make structure now

It is offered the latest disaster information by a city. Organization of a voluntary disaster prevention organization in each district and making of a local map of vulnerability to natural disasters / disaster prevention neighborhood association.

- I have it in the future

I leave structure of disaster prevention, a local connection to children. I perform a local map of vulnerability to natural disasters and a review of a disaster prevention neighborhood association regularly.

8. Earthquake assessment investigation

(1) An earthquake seismic intensity distribution forecast map

The seismic intensity distribution forecast map which I added 1,969 bowling data to the material, and analyzed investigation of Ehime and a country

①中央構造線(川上・小松断層)による直下型地震

(愛媛県地震被害想定を基礎資料とした)

② 東南海・南海地震

(中央防災会議の調査を基礎資料とした)

(2) A tsunami inundation forecast map

① The southeast sea / south seas Earthquake

(中央防災会議の調査を基礎資料とした)

9. Others disaster prevention business

(1) The establishment of satellite-based mobile phone (Isolation district measures emergency support business)

愛媛県の助成事業(歳入1,201,000円)を活用して災害発生時に孤立の恐れがある地区(4地区13箇所)の情報収集手段を確保するため、衛星携帯電話、発電機を配備(事業費3,828,930円)

(2) Making of a general disaster prevention map

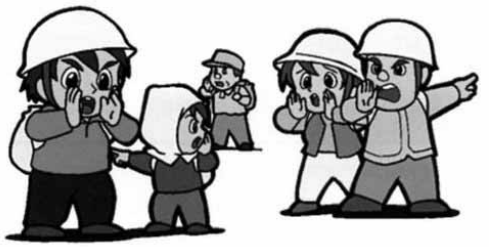
(A general disaster prevention map making support business)

愛媛県の助成事業(歳入666,000円)を活用して、市内の危険箇所、避難場所等を示した総合防災マップ(合併暫定版)を作成、全戸配布した。
(事業費2,465,000円)

(3) Enforcement of general disaster prevention train

西条市加茂川河川敷(おまつり広場)において、地震・台風を想定した「平成17年度愛媛県総合防災訓練」を開催した。

It is ... aiming at the making of godet resisting a disaster



Thank you

Informing People about the Risks from Landslide Hazards and Preparedness in Northern Thailand: A Video Material

Presented by Ampai Harakunarak, Ph.D.

Thailand Environment Institute

UNESCO ACCU Invitation Programme for International Education Exchange of Teachers and Professionals

Participatory Urban Risk Management:

Action Workshop of Education for Sustainable Development

24-29 July 2006, Kyoto University, Japan

Presentation Outline

- Backgrounds
  - The Collaboration
  - Potential Hazards to Cities
  - Communication Strategies
- Talking about Landslides
  - Rationale and Objective
  - Video Production Process
  - The Video
- Drawing Some Lessons
  - The Making of Landslide Video
  - Specific Recommendations

Production of Thailand-specific Education Materials for Natural Disaster Preparedness in the Context of Education for Sustainable Development

UNESCO (Bangkok) Regional Project on

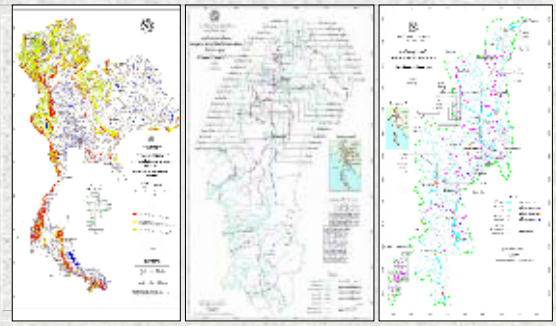
Education for Natural Disaster Preparedness in Asia-Pacific in the Context of Education for Sustainable Development (ESD)

Collaboration: Stakeholders Consultation

Country Workshop on 26 October 2005

- Organized by UNESCO Bangkok
- 24 participants from concerned parties
- Discussed the rationale and strategies for promoting disaster education in Thailand
- Concluded that a major disaster seasonally facing Thai people in specific areas was landslides

Landslides: Potential Hazards to Cities



Communication Strategies

Video was selected as the best material for communicating landslide awareness and preparedness messages to local people.

Talking about Landslides: The Objective

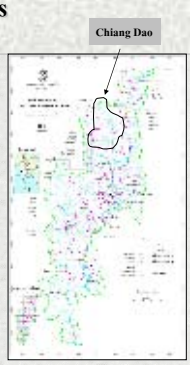
The objective was to produce Thailand-specific disaster educational materials based on the ESD framework.

Education for Sustainable Development (ESD)

ESD is a dynamic and expansive undertaking that envisions a world where every person has the chance to benefit from educational opportunities and to learn the lifestyles, behaviors and values necessary to create a sustainable future.

Target Areas and Audiences

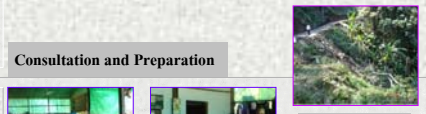
The target areas (and audiences) were the northern region of Thailand (and people who live in risk-prone areas).



The Video Production (1)

- Series of discussion and consultation with local authorities at the district and sub-district levels, as well as with a concerned national agency - Department of Mineral Resources, started in February 2006.
- Khamnan Promma Kengkla, the Head of Mae Na Sub-district, hosted meetings to arrange and prepare for video production. He also helped to coordinate and facilitate field surveys, video shooting, and interviews.

Consultation and Preparation



Field Survey

Interview

Scripting Process

- A video script was drafted, telling the story of landslide situation in Chiang Dao District, Chiang Mai Province.
- The outline of the video structure included introduction, basic knowledge on landslide hazards, testimonials, call-to-action, and preparedness messages.
- Internet research was conducted, in conjunction with expert consultation, on the concepts, terminology, and evidence.
- Drafts were reviewed by ADPC and UNESCO Bangkok.

The Video Script

Disaster Education Material

"Understanding Landslide Hazards and Preparedness in Northern Thailand"

Education for Natural Disaster Preparedness in Asia-Pacific in the Context of ESD (ASPIE Project)

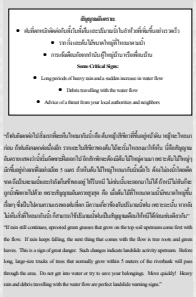
UNESCO Bangkok

Video Dialogue

Landslides constitute a major geologic hazard. They are widespread and occur rapidly, causing fatalities, injuries and serious property damage.

Each year, landslides occur in many parts of Thailand. They take many lives and property damage. Many families lose loved ones. Houses are completely destroyed. People suffer great upheavals on these lives. The scale of the tragedy can be massive.

Landslides and debris flows cause property damage, injury, and death.



Some Critical Signs:

- Long periods of heavy rain and a sudden increase in water flow
- Debris travelling with the water flow
- Advice of a threat from your local authorities and neighbors

"If rain still continues, uprooted green grasses that grow on the top soil upstream come first with the flow. If rain keeps falling, the next thing that comes with the flow is tree roots and green leaves. This is a sign of great danger. Such changes indicate landslide activity upstream. Before long, large-size trunks of trees that normally grow within 5 meters of the riverbank will pass through the area. Do not get into water or try to save your belongings. Move quickly! Heavy rain and debris travelling with the water flow are perfect landslide warning signs."

Key Messages

Awareness Messages

- Why talk about landslides?
- What are landslides?
- What causes them (with specific reference to the northern geological settings)?
- How do landslides affect you?
- How can I protect myself, my family, and my community from landslides?
- What is the best source of information in a landslide situation? Who is the person-in-charge of landslide preparedness in my community?

Action Messages

- Be prepared for a landslide
- What to do during severe storms and heavy rainfalls, which can trigger landslides?
- What to do if I suspect imminent landslide danger?
- What to do during a landslide?
- What to do after a landslide?

Video Production (2)

- Key contributors were the people of Mae Na Sub-district.
- The video was designed and produced by Thailand Environment Institute (TEI)
- The 27-minute video was narrated in northern dialect.
- Two previews of the video were conducted at UNESCO Bangkok in April 2006 - valuable comments and advice received from ADPC and UNESCO Bangkok

The Video

Lessons Learned - Making of Landslide Video

- Good Preparation: basic research to develop a carefully prepared script
- Production Planning: clearly defined goals - target audience; carefully planned production steps - scripting process, selection of production team members, selection of site and locations, scheduling interviews and shootings

Lessons Learned - Making of Landslide Video (2)

- Partnerships : identify the right partners
- Create Learning Opportunity: involve new and young people in the production process - fresh ideas and potential promoters of disaster education within the context of ESD.
- Effective Communication: continuous contact and information sharing (local language/dialect)

Specific Recommendations (1)

- Traditional Means of Communication to reach people in vulnerable areas : video conveys visual information and is easy to access by local people; community radio broadcast is an effective way to send both general and emergency messages to people living in remote areas.
- Target Audience Focused : all northern provinces, where the local dialect is spoken, will benefit from the video material.

Specific Recommendations (2)

- **Promote local contribution and support : for reproduction of the video and/or develop new educational materials for natural hazard prevention, preparedness, and response - need to strengthen local knowledge and capability to promote fund raising or to encourage the local government to allocate the fund from the annual budget system.**

Thank you for your kind attention!!

Please share your thoughts, comments, and advice……

Open Forum

(International Symposium on Risk Education for Sustainable Urban Environment)

Keynote Speech

“Sustainable Community Risk Management: Case of "Chizu Initiative" by Dr. Norio Okada, Kyoto University

Panel Discussion

Presentation of Mr. Kotaro Ito, Mayor of Saijo City

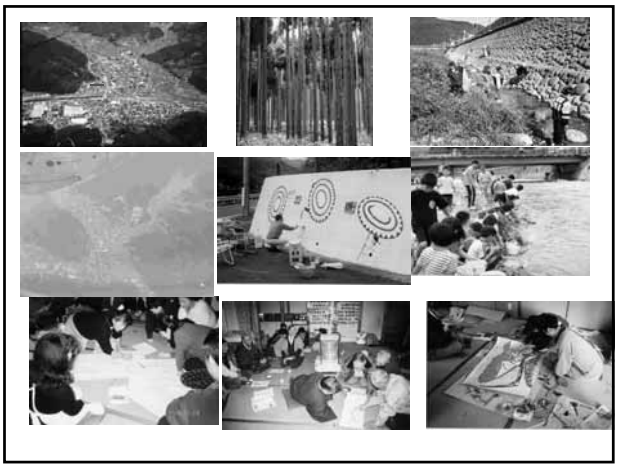
Presentation of Mr. Mohamad Ismail Mohamad Ariff, Mayor of Galle City, Sri Lanka

Presentation of Dr. Takaya Kawabe, ArTech

持続的なコミュニティ・リスクマネジメント:智頭のまちづくりの事例より

Sustainable Community Risk Management: Case of "Chizu Initiative"

京都大学(防災研究所) 教授 岡田憲夫
Norio
Okada, Prof. DPRI, Kyoto University



智頭町のデータ

http://ja.wikipedia.org/wiki/%E6%99%BA%E9%A0%AD%E7%94%BA

- **都道府県鳥取県 郡八頭郡 団体コード**31328-9
- **面積224.61**km²
- **総人口9,383人**（2000**年国勢調査時点**）
- **隣接自治体鳥取県**：
  鳥取市、八頭町、若桜町
  岡山県：
  津山市、美作市、奈義町、西粟倉村
- **町の木スギ 町の花ドウダンツツジ**
- **智頭町役場所在地**〒689-1402 **鳥取県 八頭郡智頭町大字智頭**2072-1

智頭町･杉の木村

http://www.town.chizu.tottori.jp/home/kanko/

過疎の進行に悩む農山村が、地域の存続と町の活性化を目指した新しい「村」です。

木工品の開発･販売、山菜レストラン、林間キャンプ場、テニスコートがあり、一日たっぷり遊べるネイチャーワールドで、カナダから伝えられたカントリー調のログハウスが並ぶ杉の木村は、森林浴やログハウスでの宿泊によって自然と触れ合う絶好の場として、県内外の人から利用されています。
渓流での魚釣り、キャンプ可。宿泊施設はログハウス！軽食･喫茶有り。特に柿の葉寿司や山菜うどんは人気！

杉の木村「杉トピア」
杉の香りがただようみがき丸太で作られたカナディアンログハウス！！1日たっぷり遊べるネイチャーワールド。子供から大人まで自然の中でリラックスタイム。所在地鳥取県八頭郡智頭町八河谷 問い合わせTEL＆FAX.0858-75-3180
交通アクセス智頭駅から5車で40分 休業日火曜日 料金★宿泊料金
1人2,000円 備考★ご利用期間
4月上旬～11月下旬
3人用（3棟）･7人用（1棟）･10人用（1棟）･20人用（1棟）
杉の木茶屋･杉の木村役場･バーベキューハウス･イベント広場･大水車･共同牧草場･キャンプ場･観光果園･セミナーハウス･精進荘（風呂･シャワー室）テニスコートほか
※ご宿泊可能人数:ログハウス棟100人 マップ

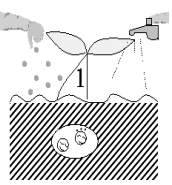
「日本1/0村おこし運動」とは

http://www1.town.chizu.tottori.jp/dd.aspx?itemid=1120#itemid1120

智頭町が平成9年度（１９９７年度）に制度化した「日本1/0村おこし運動」とは、閉鎖的・保守的・依存的な旧態依然とした村社会の変革を図り、また、町の活性化は集落の活性化からという視点にたって、「これからもその集落に住もう、どうせ住むなら豊かで楽しい村がいい」を理念とするものです。そして、こんな素朴な願いを実現するため、自分には何ができるか、何に汗が流せるか、住民一人ひとりが無（ゼロ）から有（イチ）への一歩を踏み出そうという運動です。つまり、智頭町内の各集落がそれぞれの特色を一つだけ掘り起こし、外の社会に開くことによって、村の誇り（愛）づくりを推進する住民の自立と共有のマネジメントです。

小さく生んで大きく育てる
(1) 村にある種をみつけよう。！（種がなければ新たな種をまきましょう！）
(2) 土づくりや水やりをしよう！
(3) 芽が出たら大きく育てよう！

必要なら行政も助けます。



各集落の活動と自治大臣表彰の受賞

この運動に現時点で、１０の集落が参加しており、年度末に開催する活動発表会で、各集落の独創的な活動とその成果が発表されることになっています。具体的な活動は、

- **市　瀬**･･･堤防の花づくり、村出身者との交流、特産品の開発他
- **･本　折**･･･ミニ傘･ミニわらじの販売、花づくり運動、老人への食事サービス他
- **中　田**･･･蛇の輪の復元、つちのこ探索、野鳥の巣箱設置、敬老の集い他
- **波　多**･･･集落情報化の拠点づくり、映画会の実施、ぎぼうし栽培、収穫祭他
- **中　原**･･･かずら籠の商品化、集落内の除雪、山郷杉太鼓の振興他
- **白　坪**･･･福神漬、味噌の製造販売、地域内交流事業、石碑･標注の建立他
- **新　田**･･･都市との交流事業、花づくり運動、情報誌の発行、都市の学生との交流他
- **早　瀬**･･･あずまやの建設、子供新聞の発行、模擬店･フリーマーケットの開設他
- **五月田**･･･地蔵まつり、子供新聞の発行、模擬店、フリーマーケットの開設他
- **上　町**･･･智頭農林高校との交流、あいさつ運動の推進、智頭宿の開発研究他

また、「日本1/0村おこし運動」が認められて、平成１０度「潤いと活力のあるまちづくり（住民参加部門）」優良地方公共団体自治大臣表彰を（住民も含めて）智頭町が受賞した。この受賞が励みになり、さらに住民が中心になって、活動が一層盛り上がっています。

ゼロ分のイチ運動の取り組み手順

http://www1.town.chizu.tottori.jp/dd.aspx?itemid=1120#itemid1120

まず、集落の10年後の将来像（計画）を描き、新たな組織（集落振興協議会）の設立と同時に規約を制定します。

規約は、
(1)原則として全戸が年5，000円以上を負担して全住民で運営していくこと

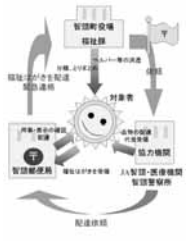
(2)活動の柱をア）交流・情報　イ）住民自治　ウ）地域経営とすること

(3)自らの責任によりボランティアで活動することを主な内容としている。そして、このような条件を満たした集落には、町が最初の2年間は年50万円(限度額)、3年目から10年目は年25万円（限度額）の計300万円（限度額）を支援します。

ひまわりシステム

http://www1.town.chizu.tottori.jp/dd.aspx?itemid=1120#itemid1120

- 「ひまわりシステム」は、役場と郵便局の共同により、農協（JA）、町立病院及び開業医、警察署の協力を得て、毎日の郵便配達を通じて日用品や薬などを配達し、独り暮らしのお年寄りの生活をサポートするものです。
- 郵政省は、智頭町の「ひまわりシステム」を政策のモデル事業として、平成9年8月から「ひまわりサービス」と名付け、秋田県二ツ井町や高知県本川村など全国45町村で同様な展開を始め、平成11年6月現在では、177市町村にサービスを広げています。



お話の骨子(Plan of My Talk)

1. **地域**(local municipalities, neighborhood communities)**はなぜ今のままでいけないのか**? **→まちづくりの必要性**(need for “machizukuri”. Japan’s community initiative)
2. **地域が生き生きと生きていくということは**?
3. **地域づくりはたった二人から始まった　鳥取県智頭町の20年余のささやかな転換の連動プロセス**

4. **日本ゼロ分のイチ村おこし運動**(Japan Zero-to- One Community Movement): **何がそうさせたか**? **何が変わったか**?

「自己選択する地域」(communities which can make a social choice for their own destination by themselves)**にむけての社会システムの転換と地域住民による行政や外部環境(自然、社会)を触媒とした転換力の相互学習の必要性**

地域づくりはたった二人から始まった:
It started with two champions
-鳥取県智頭町の20年余のささやかな転換の連動プロセス
-Chizu Town’s (Tottori Prefecture) Modest-scale but Synergetic Transformation Process

- **内側から沸き起こる弱みと強みのユラギ**
- **外から押し寄せる脅威と機会の波**
- **両者の協働的な共振関係**(synergetic dynamics)**から生まれる地域力の変化**(**向上** enhanced coping capacity)
- **その空間的・時間的・活動的連鎖・伝播現象** (spatial-temporal chained reactions and dispersions)

地域(local municipalities, neighborhood communities) **はなぜ今のままでいけないのか**? **→まちづくりの必要性** (need for “machizukuri”. Japan’s community initiative)

- **地域には外から脅威**(threats)**と機会**(opportunities)**という波(外力)が不確定的に押し寄せている。**
- **地域のことは行政任せで事足りるのか**?
- **地域(が生きる)力**(community’s coping capacity) **は、外からの波に対して強み**(strength) **を伸ばし弱み**(weakness)**をまるごとで埋める挑戦力**(integrated capacity to take a challenge)
- **視点の転換**(need to shift the viewpoint of community management to incorporate “machizukuri”)**とまちづくりのまるごと性**(holistic nature of “machizukuri”)

智頭町まちづくり物語
Tale of Chizu Machizukuri

- **始まりの始まり**: **寺谷　篤氏**(Mr. Atsushi Teratani)･**前橋登志行氏**(Mr. Toshiyuki Maebashi)**の出会いと**CCPT(Chizu Creative Project Team)**の誕生**
- **今そして近未来**:　**智頭ゼロ分のイチ村おこし運動、平成の市町村合併の嵐を耐えて**
- **その間のいきさつ**(the intermediate process)**を辿れば** ….

(第一期　Phase I)

杉の木村旗揚げ元年(1985)→ **鳥取大学社会開発システム工学科カナダ留学生のホームスティ→　岡田･寺谷の邂逅(出会い、そして三人になった??!!)→　時代と地域の象徴」としての(杉の木とライフスタイルの変化) をふまえたログハウス建設ミニ国際事業と天地開闢以来の八河谷(やこうだに)村の天の岩度が開く→　地域学習拠点としての杉の木村鳥大セミナーハウスの開設と杉下村塾→　岡田の京都大学への視座の転換･距離感覚の変化→　京都大学杉万俊夫氏の参画→　地域の攪拌化･覚醒化･攪拌化→　外部者を迎える意識を持った杉の木村住民→　小さな社会システムの変化→　杉の木村住民に委ねた杉の木村経営 と 杉の木村から山を降りた**CCPT→

(第二期　Phase II)

嵐から風に変容したCCPT(CCPT changing from a "storm" to "breeze")**と生活地域に戻った寺谷篤氏→　日本･地域と科学の出会い館の建設→　ひまわりシステム**("sunflower system" = mail delivery service combined with isolated single households' caring system)**の誕生→　日本ゼロ分のイチ村おこし運動→　平成の市町村合併の波**(amalgamation of municipalities)**に大揺れ**(shock waves)　**→２００５年 "泥仕合"の末の単独(合併しないこと)を選択**(ended with choosing to remain "independent ")**→日本ゼロ分のイチ村おこし運動第二期への模索**

日本ゼロ分のイチ村おこし運動(Japan Zero-to- One Community Movement): **何がそうさせたか**?

何が変わったか?

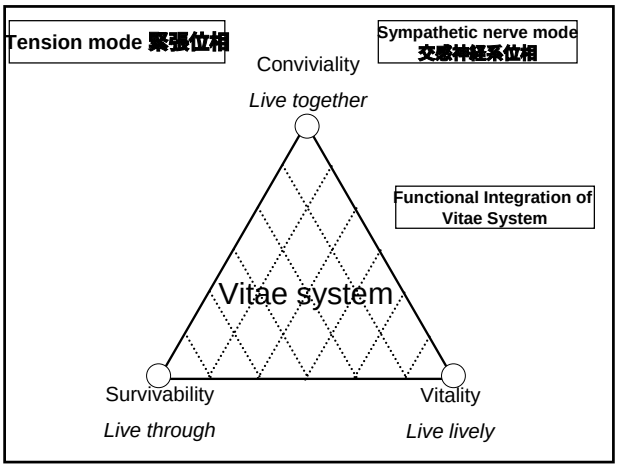
- **現実の姿**(status-quo): **行政頼みの頼りないちっぽけな集落、司つかさの行政にわが身感覚を失った集落**
- **あるべき姿**(vision): **思い出せ小さくともわがまち(小さなくに)、かけがえのないまるごとの体としてのわがまち(小さなくに)**
- **ゼロイチの三基本要件**(three conditions):
  ささやか(**ゼロ** very tiny seed= near-zero)**でよい、その第一歩(イチ** first step)：**無限**(1/0)**のエネルギーの創造過程**(1/0 infinite scale energy generation process)

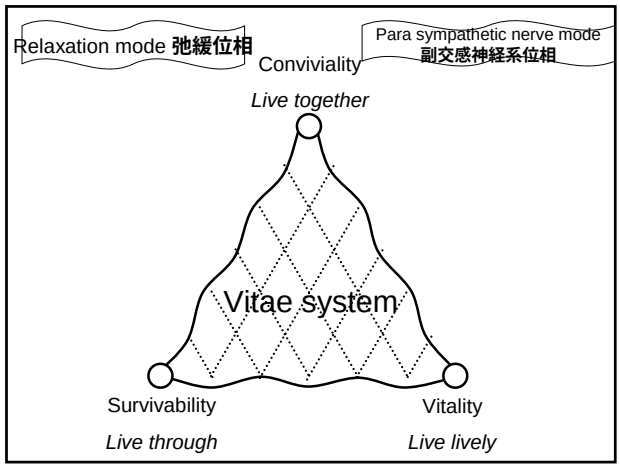
ゼロイチの3要件(Three Qualifications for 1/0 community)

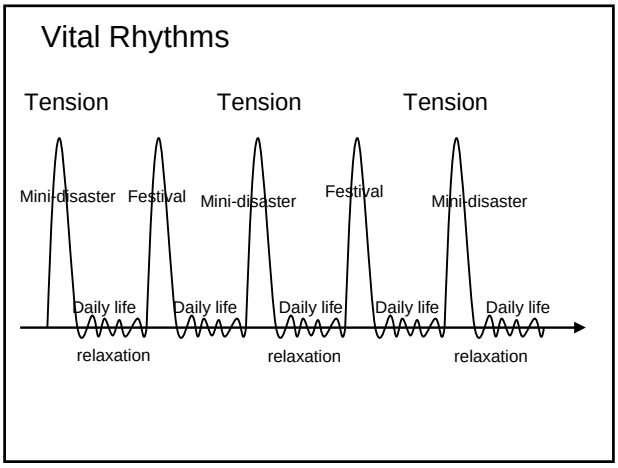
- **住民自治(自分の命(運命)は自分で守る(選ぶ)** self-autonomy by residents=become alive
- **地域経営(自分で自活力をつける)** community management=live lively
- **交流(他人を通して知る自分の価値)** communication with outsides=live together

2. 地域が生き生きと生きていくとは?

- **自然(環境)の力X社会(環境)の力X人間のささやかな力=地域が生きる力**
- **行政任せ:司ごとに分けた自然(環境)の力X司ごとに分けた社会(環境)の力X**
- **司(defined administrative duty)ごとに分けた行政の力=司ごとに分けて取り上げる区分的地域(segmented community)を生かす**
- **慣性力(惰性)(inertia, just moving)か?　変動力(ささやかな転換力)か?**
- **なんとなく生きる力か(無力)　(just living)?　生き生きと生きる力か(to become alive, live lively and live together)?**
- **ささやかな転換力(slight force to change)=想像力(imagination)X意志力(will)X実践力(practice)X触媒力 (catalysis)**
- **ささやかな転換力の梃子(intellectual leverage)={想像力X意志力X 実践力X触媒力}X知力(intellectual leverage)**
- **二人寄れば文殊の知恵(synergy of two champions sharing knowledge, experience and wisdom)→ささやかな転換力は二人寄れば生まれる**







自己選択する地域へ向けて

Communities which can change to make a social choice for their own destination by themselves)

- **社会システムの転換と地域住民による行政や外部環境(自然、社会)を触媒とした転換力の相互学習**
- **なんとなく生きる力(無気力) か? 生き生きと生きる力か?**
- **ささやかな転換力=想像力X意志力X 実践力X触媒力**
- **ささやかな転換力を引き出す知力 =想像力X意志力X 実践力X触媒力X知力**
- **(ささやかな転換力を引き出す知力 =想像力X意志力X 実践力X触媒力X知力)^{2}**
- **(ささやかな転換力を引き出す知力 =想像力X意志力X 実践力X触媒力X知力)^{2}X時間の蓄積と持続性** (time and persistence)

むすび(Conclusion)

- **仮説的検証**(advocacy practice as a hypothesis) **へ向けて**
- **定点観測**(continuous monitoring)**の必要性**
- **比較分析**(comparative analysis)**の必要性**
- **暗黙知**(tacit knowledge)**を形式知**(explicit knowledge)**にする科学的営み**
- **新しいフィールド実践科学**(innovative field-based implementation science)**へむけて**
- Case Station-Field Campus Scheme **の可能性**

国際シンポジウム『住み続けたい町のリスク学』

2006年7月29日

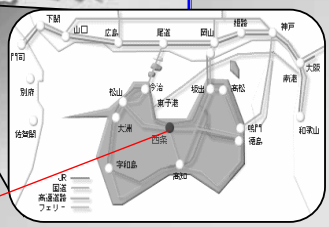
西条市長　伊藤　宏太郎　Itou　koutarou

愛媛県総合防災訓練　平成17年9月1日
主 催 者：愛媛県
場　　所：西条市加茂川河川敷地にて
参加機関：西条市、新居浜市、四国中央市ほか60機関
参加人員：1，750名

強い連携（行政・地域・機関）を結ぶ

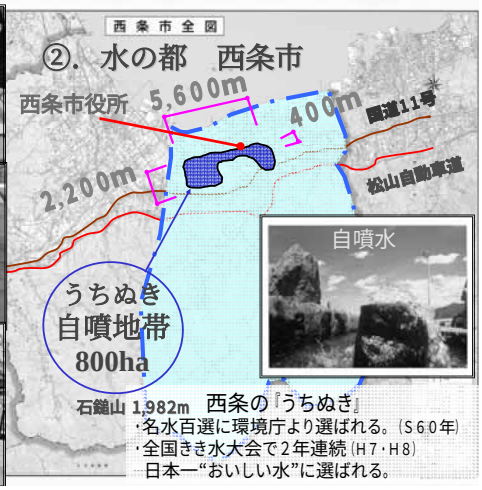
①．『西条市』位置図

西条市の
面積　509km2
人口　116千人



愛媛県西条市

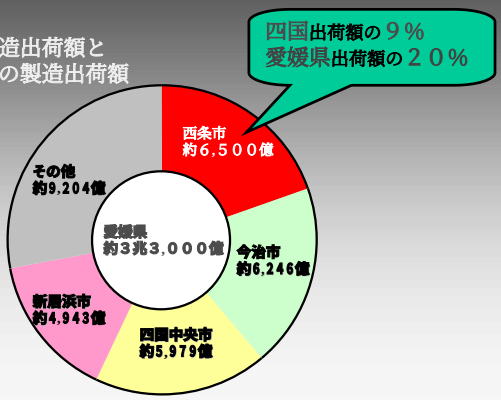
②．水の都　西条市



西条の『うちぬき』
・名水百選に環境庁より選ばれる。（S60年）
・全国きき水大会で2年連続（H7・H8）
　日本一“おいしい水”に選ばれる。

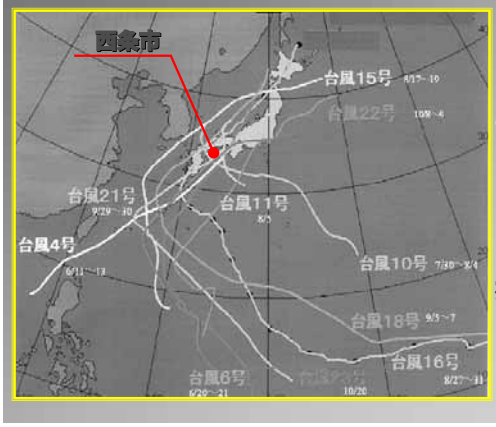
③．西条市の産業

愛媛県の製造出荷額と
近隣市の製造出荷額



江戸時代から引き継がれる伝統行事

⑤．平成16年 四国に被害をもたらした台風進路図

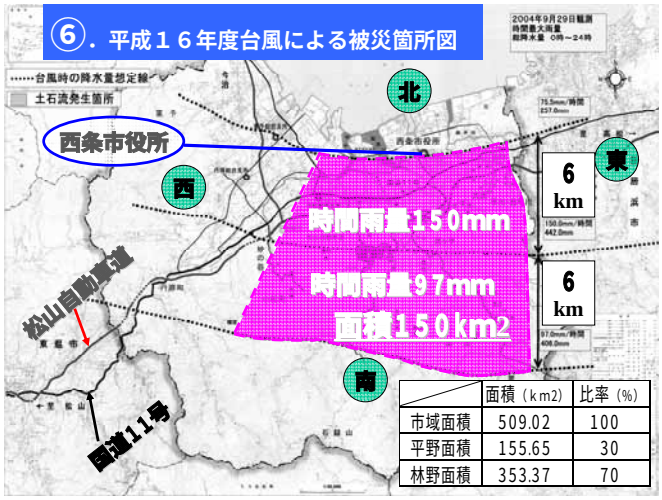


日本への台風
上陸数10個
四国への台風
上陸数6個
“観測史上最多”

愛媛県各地で
332箇所の
土砂災害が発生

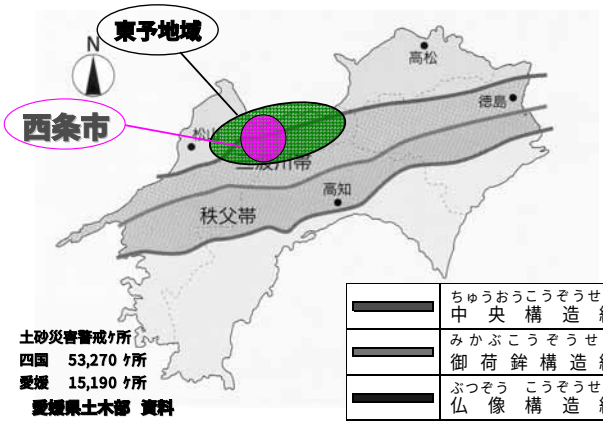
死者数
愛媛県：17名
うち西条市：5名

⑥．平成１６年度台風による被災箇所図



	面積（km2）	比率（%）
市域面積	509.02	100
平野面積	155.65	30
林野面積	353.37	70

⑦．西条市の地形、地質、気象条件



土砂災害警戒ヶ所
四国　53,270ヶ所
愛媛　15,190ヶ所
愛媛県土木部 資料

⑧．被災写真 台風21号（H16年9月29日・30日）による被災

2004/10/1　ヘリコプターにて上空より撮影

崩落土砂により寸断された
国道194号（西条市～高知市）
山間部（加茂地区）

崩土および倒木を平成16年10月1日～4日（4日間）自衛隊等により除去作業を行った。
作業者数：延べ230名
協　力：自衛隊、警察、建設業協会

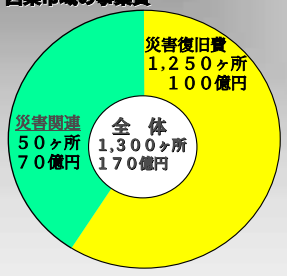
"一定災"を採択された大浜地区

知的障害者更生施設「星の里」収容人員50名に大きな被害を及ぼした。
また、下流700m地点では1名の命が失われました。

⑨．災害発生から復旧まで

平成16年台風21号襲来直後
2004.10.14　災害に対し効率かつ迅速な復旧を図るため
"災害復旧対策室"を設置

西条市域の事業費



被災

復旧

災害復旧工事　H17年3月（着手）～H18年7月（現在）復旧率97%

⑩．16年災害 被災木（燃材）を市民へ無料配布

目的：市民の災害に対する意識の風化防止・
経費の節減・被災木の有効活用

市民協力
・配布本数：32,160本
（原木数 3,402本）
・協力者数：1,346名

活用方法：イス、テーブル、薪、炭、ガーデニング、動物園の動物用玩具など

平成17年6月20日～平成18年7月（現在も配布中）

⑪．砂防事業の取り組み（ハード対策）

建設中の砂防施設

現在の取り組み中事業
・計画砂防施設：25箇所
・事業費：60億円
・事業計画：平成16～19年度（4ヶ年）

⑫. 安全で安心して暮らせる西条市“自治防災都市”

市民安全部の新設（H18年4月1日）

・防災，交通安全，治安，災害復旧対策室

・人員：11名

西条市防災マップ作成

（平成18年4月　西条市全戸へ配布）

⑬. 防災について

西条市防災の基本

死ぬな！

逃げろ！

助けろ！

1．市民全員が参加し主役となり取り組む

2．災害に弱い人が助かる仕組みを市民がつくる

3．地域の防災文化を，みんなで共有する

4．後世に伝え，災害に強い地域社会をつくる

自主防災会による図上訓練の様子

⑭. 西条市の防災計画（具体的取組）

2004災害の台風災害，今後予想される東南海地震を想定し災害に強い“まちづくり”を目指す。

計画作成期間：平成17年9月～平成20年9月（3ヶ年）

事　業　費：1億2千万円（市単独事業）

（写真：小学生によるDig）

事業概要

①自主防災組織の育成

②市民と行政間の防災ネットワーク構築

③災害図上訓練（地域防災地図作成）

④アンケート・ヒアリング調査の実施

⑤衛生携帯電話の設置

⑥西条市防災マップの作成

⑦防災士育成事業

⑧市職員，消防関係者への防災意識向上

⑮. 西条市

津波浸水予想図

地震想定震度図（南海地震）

西条市役所

西条市役所

H18年7月10日　市民へ公開

⑯. 西条市　12歳教育（小学6年生）

『　12歳児の意気込み　』

1．自分と他の人を守る

2．防災についてもっと知りたい

3．地震が恐ろしい

4．人々に情報を伝える

5．備えることの大切さ　など

（平成18年7月27日　子供サミット　参加人数100名）

⑰. 西条市　12歳教育

京都大学　小林正美教授と

西条市長　伊藤宏太郎の対談

（H18年6月1日　西条市役所にて）

- 小学校6校、中学校2校
  参加予定者数800人
- 京都大学との
  タウンウォッチング、山ウォッチング
- 人と防災未来センター視察

京都大学ラジブ・ショウ助教授による

学校関係者への防災教育の提案

（H18年2月21日　西条市役所にて）

⑱．だんじり防災

自主防災地域・コミュニティ育成事業

江戸時代からの伝統行事
お祭りを核としたネットワーク

だんじり防災

太鼓台防災

『 地域住民間の強い絆を介してコミュニティの活性化 』

みこし防災

獅子舞防災

⑲．西条市 木製都市構想

完成予想図

西条市総合福祉センター
（もてこい元気館）

四国鉄道文化館（仮称）

放置された山林の活性化を
図り木材の利用促進を図る

西条公民館
（木の部屋）

⑳．安全で安心して暮らせる西条市

1．交通安全

・横断旗設置事業
・高齢者交通安全指導アドバイザー
・交通指導員　１００名

2．治安

・セーフティーパトロール隊　隊員３３名
・愛媛県外国人問題対策協議会西条支部設立（Ｈ１８年7月１９日）

ありがとうございました。
今後とも、皆様のご支援をよろしくお願い致します。　了

Education of Risk Management
July 29, 2006 Kyoto, Japan

Environmental Education Programme
Kids'ISO14000

Takaya KAWABE
ArTech/United Nations University

Education of Risk Management
リスク教育

- 2 different kinds of Risk **2種類のリスク**
- Global Warming Type **地球温暖化型**
  - Gradual change to the Point of No return
    徐々に変化して、大きな事件とり、戻れない
- Earth Quake Type **地震型**
  - Pulsate events with long interval**パルス的に**
    事件が起こり、また、元へ戻る

Comparison of 2 Risk Education

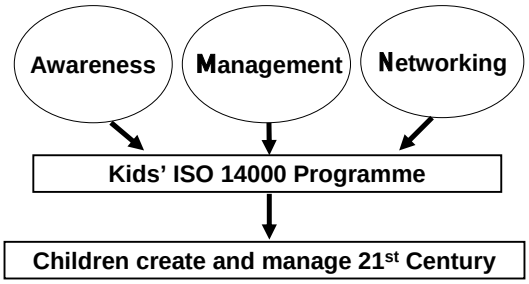
Gradual change
- Global
- No experience (no example)
- Awareness & Practice
- Reduction of Risk

Pulsate Events
- Regional
- Experience in the past
- Awareness & Preparation
- Reduction of Risk

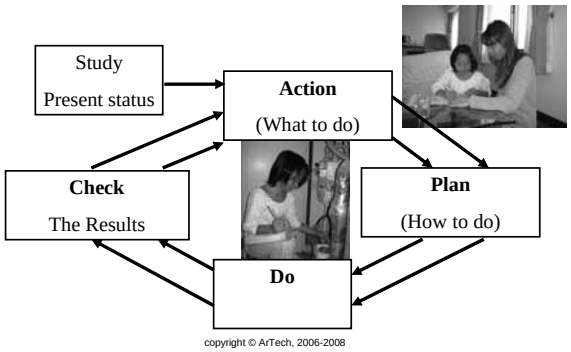
Aims of Kids' ISO 14000 Programme

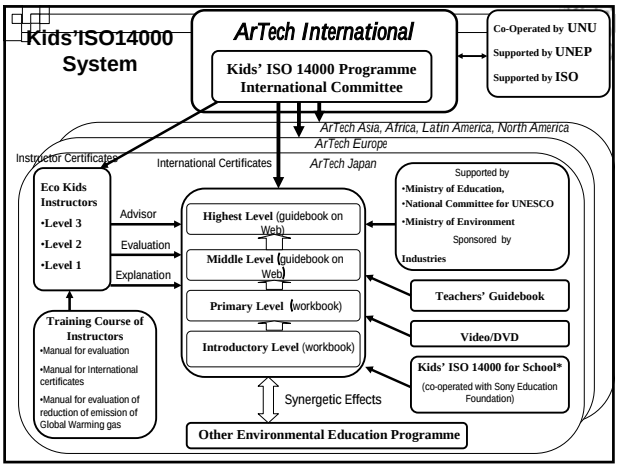
- Children have hope for Future.
- Children have confidence to live.
- Children have capability to overcome. Environmental Issues and many other global and local issues.
- Children can make their own life.

Approach of Kids' ISO14000 Programme

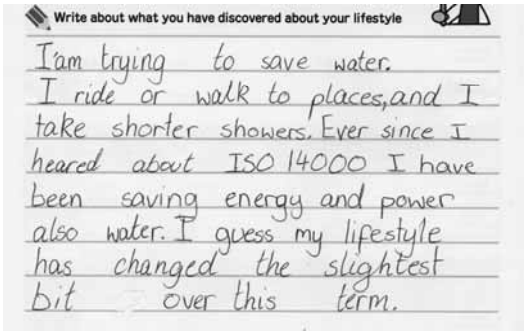


P→D→C→A→P→…





Reaction of Children



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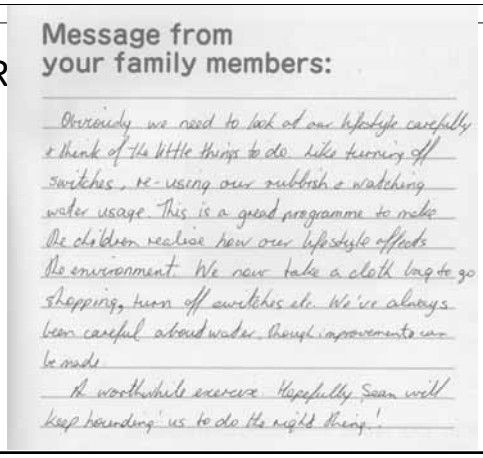
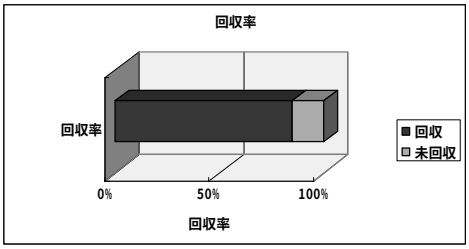


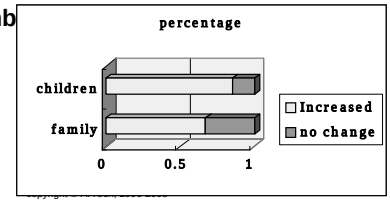
High accomplishment rate

More than 85% of children can accomplish the programme



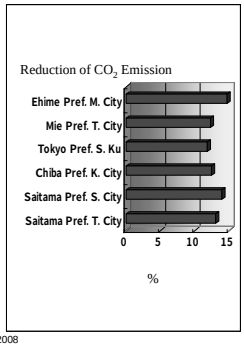
Environmental Awareness

- **80% of children increase their environmental awareness**
- **Children affect on the awareness of their family memb**



Children can do !

- In many cities in Japan, children could reduce CO_2 emission.
- Children can do better, since they are more serious, considering their future.



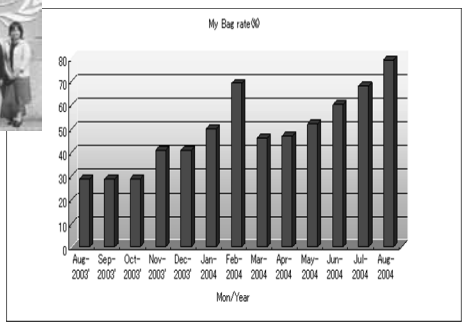
Certificate for reduction of Emission of Global Warming Gases

- CDM from Kyoto Protocol
- By support of MOE an METI, the amount reduction of Emission GHG
- ArTech issues th Certificate
- Cooperation in Kids

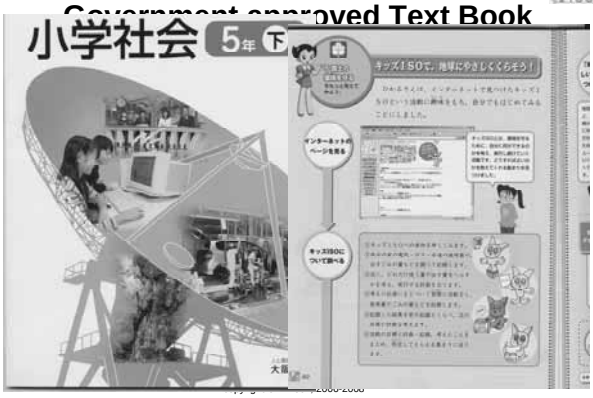
International Certificates

- Primary Level and up.
- To fix the environmental awareness.
- Power of Methodology of Environmental Management.
- International Network of Children who have the certificates.

Middle Level 2

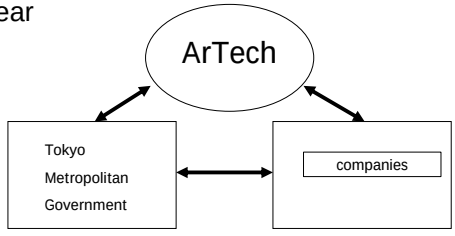


Government approved Text Book



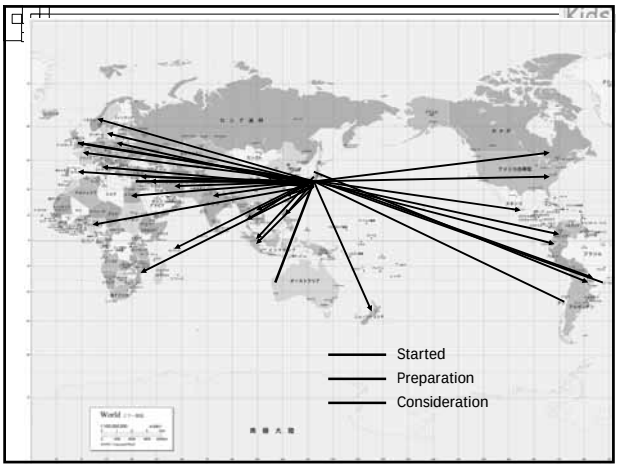
Tokyo Metropolitan Government

- 1,400 Schools, 100,000 children in every year



Australian Version

- **Boeing Australia, Co. Ltd. Started to use Kids' ISO 14000 Programme for their CSR activities as a test.**
- **100 Australian Children started to participate in March 2004.**
- **Their workbooks are now evaluated in Tokyo**
- **In France, 2 Schools start to implement in November as tests.**
- **In UK, production of UK version starting, now.**



Children in Australia started Kids ISO Programme, and many other children will follo

エコ･キッズ インストラクター
UNESCO 国際研修会

2004年11月8-9日

2005年11月7-8日

ArTech-KATS cooperation

, USA

2005.6.15 New York, CEI-PEA

国際養成講座の開始

- 第
年
に
- 第
リ

Future of Kids' ISO 14000 Programme

1. **Methodology of "management" can be applied to other fields to solve global issues, such as "poverty"**
2. **After 10 years, those children become adults and they would work for global and social issues to create 21st century by using this methodology and their networks.**

Evaluation and Follow-up

Evaluation on the programme from participants

Overall, the programme was found to be very informative and well organized.

Many participants mentioned the field visit to Nishinomiya was one of the most useful and valuable activities among all and some even suggested to have more field trip in future programme. Collaboration of local government, NPO, community and private sectors toward environmental education was truly impressive and many participants were inspired from the field trip.

Information sharing through case study presentation was also rated very high among participants. Both overseas and Japanese participants could learn from other cities experiences. For overseas participants, it was a rare opportunities to interact with Japanese local government officials who is working at the ground level and share their actual experiences and lessons learnt. Usually this kind of interaction is difficult because of the language barrier. For Japanese participants also, it was a unique and refreshing experiences to learn other cities' challenge.

Group discussion was one of the main activities during the programme and its methodology and theme were highly appreciated by participants. Every group discussion was linked with the module theme of that day and participants could use the knowledge they learnt and their own actual experiences. Because of the small number of people in one group, it was conducted very participatory way.

Each module lectures were also informative and educational and rated highly from participants. Modules lectures were also conducted in participatory way and discussion at each module was active. Themes of modules covered the wide range of issues regarding urban risk and environment and disasters and participants could gain knowledge in holistic way.

There are some suggestions on the lengths of the programme. Since many participants were busy, it was very difficult to attend full 8 days. To give opportunities of attending this kind of programme to more people, the length of a programme can be shorten.

Japanese participants expressed their participation and contribution was limited due to the language barrier (medium was English). Translators were arranged for Japanese participants during the workshop, however, due to its nature of the programme (participatory and discussion style), there was limitation in providing full information to Japanese participants. Interestingly, some overseas participants expressed their strong appreciation to have Japanese colleagues and their contribution in the programme even though there was some language limitation.

Suggested Follow-up Activities

•An “A-Z” guide of the issues and topics that came up during the training
•Weblinks and other resources made available regularly online
•Create opportunities for training in other countries to apply Japanese knowledge/experiences
•Capacity building is lacking in many of our countries: use developing country people in research being carried out in Japan
•Provide opportunities to understand the underlying *cultural fabric* over which everything else works!
•Internships and secondments in local governments – a two way flow.
•Sister city twining: specific for the issue of disaster management??
•Build on and maintain the network of all the participants/resource persons
•Organize city-specific action-based trainings in developing countries
•Keep in touch with all participants, and follow-up on their work/experiences
•Bring in a wider range of professionals – financial experts, international organizations etc.
•Advocacy - provide resources, ‘messages’ (and PPTs) to explain concepts to a wider range of stakeholders
•Bring case studies, examples, tools, and more info on various issues from the participants. Eg: “Safer Community Plan” tool
•Collectively develop principles/tools on urban risk that can be applied elsewhere.
•Need more in-depth insights into Japanese local government programme and implementation in disaster management and related issues
•*Real action* in the field. This is important! Balance this with theoretical aspects.
•Contextualize disaster management within larger processes of urban and economic growth
•Learning opportunities should be created for different stakeholders in different ways
•Broader representation of different stakeholders at different levels may be needed
•Focus should balance between hard and soft issues. City administration should also work on communication system etc.
•community-specific planning for their needs and requirements is needed. What can the community do themselves? At what point should the local government take over?
•Need to develop support systems as alternatives/complements to those set up by the local government
•Working together with different local government departments is important! (Eg: building codes and disasters)

Appendices

(Appendix A) Workshop agenda and schedule

Participatory Urban Risk Management:

Action Workshop on Education for Sustainable Development

Date: 23 – 30 July 2006

Venue: Kyoto University, Graduate School of Global Environmental Studies, Japan

Organized by: Graduate School of Global Environmental Studies, Kyoto University, United Nations Environment Programme, International Environmental Technical Centre (UNEP-IETC), SEEDS and Asia/Pacific Cultural Center for UNESCO (ACCU)

Supported by: Yomiuri Shimbun

Background and rationale:

The world is facing an increasing frequency and intensity of disasters – natural and man-made – that have had devastating impacts. As reported by the secretariat of the UN International Strategy for Disaster Reduction (UNISDR), the last ten years have seen 478,100 people killed, more than 2.5 billion people affected and about US$ 690 billion in economic losses due to disasters. Disasters triggered by hydro-meteorological hazards amounted for 97 percent of the total people affected by disasters, and 60 percent of the total economic losses. The tragedy is that many of the losses due to such disasters could have been averted or reduced with proper risk management. This workshop aims at developing action-oriented educational material and decision-making toolsets to be used locally by various stakeholders, especially in urban areas, to promote the importance of appropriate risk management. The workshop will particularly focus on issues of urban risk management, need for community participation, and the socio-economic issues, emphasizing the importance of an environment friendly urban area that will lead to a safe and secure society.

Objectives:

While there has been tremendous work (project implementation and training programs) on international level, and national policy level, the challenge remains as to enhance actions at local level. To overcome these challenges, the workshop's objectives are:

1. To provide opportunities for participants coming from different fields and countries to share their experiences and knowledge on sustainable urban risk management issues
2. To develop information dissemination methodologies on assessment of urban risk, proactive risk education, decision making for sustainable management, and urban eco communities,
3. To develop learning material and decision-making tools for sustainable urban management to be used by local government officials, development practitioners including NGOs, local decision-makers, and local community leaders.

To achieve the above three objectives, the workshop is structured along the six thematic modules, namely: (a) risk assessment, (b) action planning, (c) decision-making, (d) implementation management, (e) education for sustainable development, and (f) information and communication management.

Participants:

About 40 participants from Asia and the Pacific region

Participating countries:

Bangladesh, Canada, India, Indonesia, Japan, Malaysia, Nepal, Philippines, Sri Lanka, Thailand, UK, Vietnam

Date	Activity	Venue
Day 1 23rd July (Sunday)	AM: Arrival of Participants	
Day 2 24th July (Monday)	8:30 – 9:00 Registration 9:00-10:00 Opening Session Welcome remarks: Masashi Kamon, Dean, GSGES, Kyoto University Opening remarks: Kazurou Iida, Managing Director, ACCU Introductory remarks: Hari Srinivas, Chief of Urban Environment Management Unit, UNEP/IETC Workshop Overview: Rajib Shaw, Kyoto University Self introduction of participants 10:00-10:30 *Coffee Break* 10:30-12:30 Key note lectures: Urban Disaster Issues: Norio Okada Urban Environmental Issues: Kazuhiro Ueta 12:30-14:00 *Lunch Break* 14:00-17:30 Video conference 18:00 *Official Reception*	KU GSGES Lecture Hall Kyoto University Media Center *Noa Noa, Kyoto*
Day 3 25th July (Tuesday)	9:00-10:30 **Module 1: Risk Assessment: Fumio Kaneko, OYO International** 10:30-11:00 *Coffee Break* 11:00-12:30 **Module 2: Action Planning: Lorna Victoria, Centre for Disaster Preparedness (CDP)** 12:30-14:00 *Lunch* 14:00-15:00 Plenary Presentation from Japan: Toyooka City: 20 minutes Presentation from abroad: Nepal: 20 minutes Discussion: 20 minutes 15:00-17:00 Group Discussion Three groups: government, NGO and Community 17:00-18:00 Plenary Discussion	KU GSGES Lecture Hall
Day 4 26th July (Wednesday)	Field Trip to Nishinomiya	Nishinomiya City

Day 5 27th July (Thursday)	9:00-10:30 **Module 3: Decision Making: Hari Srinivas, UNEP** 10:30-11:00 *Coffee Break* 11:00-12:30 **Module 4: Implementation Management: Hidetomi Oi, JICA** 12:30-14:00 *Lunch* 14:00-15:00 Plenary Presentation from Japan: Kitkyushu City: 20 minutes Presentation from abroad: Bangladesh: 20 minutes Discussion: 20 minutes 15:00-17:00 Group Discussion Three groups: government, NGO and Community 17:00-18:00 Plenary Discussion	KU GSGES Lecture Hall
Day 6 28th July (Friday)	9:00-10:30 **Module 5: Education for Sustainable Development: Rajib Shaw, Kyoto University** 10:30-11:00 *Coffee Break* 11:00-12:30 **Module 6: Information and Communication Management, Manu Gupta, SEEDS** 12:30-14:00 *Lunch* 14:00-15:00 Plenary Presentation from Japan: Saijo City: 20 minutes Presentation from abroad: Thailand: 20 minutes Discussion: 20 minutes 15:00-17:00 Group Discussion Three groups: government, NGO and Community 17:00-18:00 Plenary Discussion	KU GSGES Lecture Hall
Day 7 29th July (Saturday)	9:00-12:00 Discussion on Future and follow-up activities Course evaluation 12:00-13:00 *Lunch* 13:00-17:00 **Open Forum on Urban Risk Management**	KU GSGES Lecture Hall Siran Kaikan, Kyoto University
Day 8 30th July (Sunday)	Departure from Kyoto	

(Appendix B) Workshop background note

Background Note

PARTICIPATORY URBAN RISK MANAGEMENT:

Action Workshop on Education for Sustainable Development

CONTENTS

1. Environment and Disaster Management

The impacts of disasters, whether natural or man-made, not only have human dimensions, but environmental ones as well. Environmental conditions may exacerbate the impact of a disaster, and vice versa, disasters tend to have an impact on the environment. Deforestation, forest management practices, or agriculture systems can exacerbate the negative environmental impacts of a storm or typhoon, leading to landslides, flooding, silting and ground/surface water contamination – as illustrated by the 2004 hurricane and storm tragedies in Haiti, and in the Philippines. We have only now come to understand these cyclical causes and impacts and realize that taking care of our natural resources and managing them wisely not only assures that future generations will be able to live in sustainable ways, but also reduces the risks that natural and man-made hazards pose to people living today. Emphasizing and reinforcing the centrality of environmental concerns in disaster management has become a critical priority, as advocated by UNEP, requiring the sound management of natural resources as a tool to prevent disasters and lessen their impacts on people, their homes and livelihoods. Thus, understanding of current practices of disaster preparedness has to intrinsically incorporate environmental management issues.
The link between environment and disaster is prominent in the area where natural and social issues merge. Environment-disaster linkage, rural urban linkages are the issues

linked to the overall concept of human security. Climate change impacts are often regarded as the missing link between environment and disaster.

Meteorological and hydrological events, such as typhoons, are hazards that cause heavy rain, high wind and sea surges. But the real damage also happens due to the vulnerability of the people who lie in its path. Post-disaster assessment of hurricanes and typhoons have clearly illustrated that, along with disaster preparedness, proper management of the environment – its air, land, water, forests, and wastes, go a long way in reducing the risks and vulnerabilities associated with typhoon. Need for better environmental management also finds its precedence in the risks and hazards posed by industrial sites, as a result of earthquakes, landslides, flooding etc.

2. Urban Issues

As cities all over the world have urbanized rapidly after the industrial revolution, most cities have confronted environmental problems such as poor air and water quality, high levels of traffic congestion and ambient noise, poor-quality built environment, derelict land, greenhouse gas emissions, urban sprawl, generation of waste and waste-water. In particular, cities in the developing world face problems related to the living conditions in which the urban population lives. In the context of urban cities in the developing world, it can be narrowed to the quality of life of living population in the cities. Basically, examples of environmental issues in urban cities include problems such as pollution of local waterways and unfilled land due to uncontrolled release of wastewater, unsanitary conditions of many low-income settlements, low-level of urban solid waste collection, amounts of industrial hazardous waste, or air pollution. These problems are caused by inadequate development plan to avoid the environmental problems as well as urban poverty such as a lack of access to basic services.

In order to counter the urban city problems, numerous initiatives supported by development assistance agencies were launched and attempted to provide basic needs and alleviate poverty. However, there has not been sufficient emphasis on environmental sustainability, despite the fact “sustainable development,” which consists of three pillars of environmental sustainability, economic sustainability and social sustainability, has become one of the most popular words in the field of development. The environmental problems in cities are particularly complex as their causes are inter-related. The environmental problems have an adverse affect on not only health, but also economic activities and social issues. For example, problems related to a poor quality built environment are often linked to underlying socio-economic problems. However, in fact, relatively lower priorities were given to environmental problems than other noticeable issues, especially economic issues like unemployment and business depression.

In developing counties, disasters cause major setbacks to economic and social development, and cause the diversion of funds from development to emergency relief and recovery. Urban areas are particularly vulnerable to disruptions from extreme events where the combination of structural poverty, decaying and substandard infrastructure, high population densities, and concentration of economic assets and commercial and industrial activities magnify the problem.

As an example, large scale disasters between June 1999 and March 2000 alone highlight the terrible convergence of urbanization and natural hazards. These include two earthquakes in Turkey's heavily urbanized northeastern region in August and November 1999. The official death toll for the first, larger earthquake was more than 17,000; 44,000 people were injured and nearly 300,000 homes either damaged or collapsed. Venezuela's floods destroyed more than 23,000 houses and damaged further 64,000. The two cyclones that hit India's state of Orissa in October killed well over 10,000 people and made 8 million homeless. This devastation continued until recent years with more disasters in the urban areas.

3. World Conference on Disaster Reduction (WCDR)

The World Conference on Disaster Reduction was held from 18 to 22 January 2005 in Kobe, Hyogo, Japan, and adopted the present Framework for Action 2005-2015. The Conference provided a unique opportunity to promote a strategic and systematic approach to reducing vulnerabilities and risks to hazards. It underscored the need for, and identified ways of, building the resilience of nations and communities to disasters. In the conference, the States and other actors participating at the World Conference on Disaster Reduction resolve to pursue the following expected outcome for the next 10 years: *The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries.*

The realization of this outcome will require the full commitment and involvement of all actors concerned, including governments, regional and international organizations, civil society including volunteers, the private sector and the scientific community. Drawing on the conclusions of the review of the Yokohama Strategy, and on the basis of deliberations at the World Conference on Disaster Reduction and especially the agreed expected outcome and strategic goals, the Conference has adopted the following five priorities for action:

- Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation
- Identify, assess and monitor disaster risks and enhance early warning,
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels,
- Reduce the underlying risk factors, and
- Strengthen disaster preparedness for effective response at all levels

The current program is in line with the WCDR recommendation and action plan to strengthen local capacities on risk reduction.

4.Decade of Education for Sustainable Development (ESD)

The United Nations General Assembly proclaimed the ten-year period from 2005 to 2014 as the United Nations Decade of Education for Sustainable Development (ESD). Governments around the world are invited to use the Decade to integrate education for sustainable development into their national educational strategies and action plans at all appropriate levels.

UNESCO is designated as the Lead Agency in the promotion of the Decade, and is

required to consult with the United Nations and other relevant international organizations, governments, non-governmental organizations and other stakeholders to develop a draft international implementation scheme for the Decade, bearing in mind the relationships between education for sustainable development and current international educational priorities.

The Rio Declaration from the World Conference on Environmental and Development 1992 began by stating:

> "*Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature*".

The Johannesburg Declaration at the World Summit on Sustainable Development in 2002 built on this aspiration and expressed the commitment of world leaders "t*o build a humane, equitable and caring global society cognizant of the need for human dignity for all*." Sustainable development is a dynamic and evolving concept with many dimensions and interpretations and reflects locally relevant and culturally appropriate visions for a world in which development "*meets the needs of the present without comprising the ability of future generations to meet their own needs*". The Millennium Development Goals provide targets for international actions to bring such visions into reality by: overcoming poverty; improving child, maternal and sexual health; expanding educational provision and redressing gender inequalities in education; and developing national strategies for sustainable development..

Education for Sustainable Development has four major domains, reflecting diverse goals and audiences: promotion and improvement of: 1) *basic educatio*n, 2) *reorienting existing education* at all levels to address sustainable development, 3) d*eveloping public understanding and awareness of sustainability*, and 4) *training*. Thus, the focus of ESD activities will be advocacy, communication and networking directed at facilitating all educators to include sustainable development concerns and goals in their own programs. These issues constitute the priorities for planning programs and activities that will support the objectives of ESD. Among 15 strategic perspectives in the area of socio-cultural, environmental, and economic, 5 issues are under environmental perspectives which include: 1) Natural resources (water, energy, agriculture, bio-diversity), 2) Climate change, 3) Rural transformation, 4) Sustainable urbanization, and 5) Disaster prevention and mitigation.

Under the ESD, the current program will target to an integrated risk reduction in the urban areas, through training and capacity building of different stakeholders.

5. Illustrative Examples

5.1 Local Agenda 21

It has been recognized that successful local authorities to solve the urban environmental issues have used integrated approaches to manage the urban environment by adopting long-term and strategic action plans, in which links between different policies and obligations (e.g. land-use, noise, air quality), including at different administrative levels. Integrated approaches result in better planning and more significant results. After all, It is important for local authorities to take the necessary steps to achieve greater use of integrated management at the local level.

There are some cases where environmental sustainability is effectively taken into

consideration in city development strategies through development of LA 21. The implementation of Local Agenda 21 in some cities in Thailand is one of the good examples.

After the late half of the 1980s not only Bangkok, the country's capital, but rural industrial cities rapidly became industrialized and urbanized in Thailand. Such rapid change in urban environment brought serious environmental pollution and health damage to city population. To tackle the phenomenon, the Thai Government with the help of various development agencies started to manage and recover local environment consulting with municipalities and local communities. During this process, Local Agenda 21 (LA21) was implemented as a way to promote environmental management at the municipal level, and it was first introduced to four cities, namely, Korat, Trang, Lamphun, and Bangkok. Although LA21 as an original concept emphasizes the aspect of environmental management, LA21 in Thailand started in its guise as a realistic and feasible city development plan to meet cities' needs. For instance, in Korat, where poverty and health problems clearly existed, LA21 was translated to a health improvement program with an environmental taste to it. In the case of Trang, the city adopted LA21 as a city development plan to install solid waste treatment site and waster water treatment plant, and few years later ameliorated it to the concept of "sustainable tourism" to further reduce poverty and improve the economic situation in the city. It should be noted as well that the concept of "sufficiency economy," a philosophy rooted in Buddhist concepts and bestowed by the country's King, contributed to mainstream the idea of environmental sustainability into the local city development planning.

5.2 Community-Based Environmental Management

Moreover, it has been recognized that in order to solve urban environmental problems, it is important to empower community in many dimensions. An issue like dilution of community relationships in urban areas is becoming a serious problem. Such dilution of community adversely impacts environmental problems and economic gap, and economic, social and environmental issues have generated synergistic negative effects which have worsened urban environment.

Therefore, public participation is one of the most important tools for sustainable cities. Nishinomiya city in Japan is one of the most successful cities to promote community-based environmental management towards implementation a sustainable city. Nishinomiya city has been implementing a project, "Environmental learning city," where community-based environmental management has been conducted through town watching (neighbourhood watch) according to "Worksheets of Safety and Eco-action" which was developed by Nishinomiya city; and environmental education programmes.

5.3 Urban Eco-Village

In order to remedy the problems resulted from prioritizing human economic development, various "ecovillages" all over the world came to be established. Each village addresses different issues such as the environmental problems, social problems, and/or economic problems, but also commonly they share the goal of sustainable development and the pursuit of the true meaning of "wealth." In this light it can be said that today's attempts at ecovillages can be viewed as archetypal "models" for sustainable societies.

5.4 Databases and networks of good practices on urban environment

Some cities have promoted a sustainable city projects, and developed strategies or indicators for implementation of the projects. International organizations such as UN-HABITAT, Council for Local Environmental Initiatives (ICLEI) and European Commission (EC), have developed databases to disseminate the success stories. In particular, EC is actively promoting a Sustainable City Projects which published the European Sustainable Cities Report and awarded "Sustainable City Award" to successful cities regularly. "Sustainability Study Group", which consists of researchers of Kyoto University Graduate School of Global Environmental Studies has researched Sustainable Cities for more than five years.

6. Background of Participants

The participants will come from a wide range of background. Mainly, it consists of:

- *Local government officials and chief executives* (Japan: 9, Sri Lanka: 1, Malaysia: 1, Indonesia: 1, Vietnam: 1)
- *Academic and research organizations* (Bangladesh: 1, Nepal: 1, Japan: 10),
- *Non-government organizations (NGO) and consulting firm* (India: 2, Philippines: 1, Thailand: 1, Vietnam: 2, Japan: 3)
- *International organizations/ Foundation* (JICA: 3, UNEP: 1, ACCU: 1)

Total number of participants is around 40.

Two mayors will participate from the city of Saijo, Ehime prefecture (Japan) and the city of Galle (Sri Lanka). Both these cities were affected by disasters in 2004: Saijo with two typhoons (Typhoon 21 and 23), and Galle with tsunami (Indian Ocean Tsunami of 2004 December). The mayors will describe the experiences of disaster recovery and community based education and learning process.

Local government officers will participate from four cities in Japan: Nishinomiya, Saijo, Toyooka, and Kitakyushu. Among these, Saijo and Toyooka have experienced the typhoons of 2004, and have started innovative disaster education cum recovery programs. The city of Nishinomiya is well known for its community based environmental education, and the city of Kitakyushu is famous for its pro-active role in the international cooperation in environmental management. All the cities have their unique characteristics, and through the collaborative sharing of lessons, the learning will have practical implications to use the lessons into the cities disaster and environment management and education processes.

The city governments and local community leaders of Malaysia, Indonesia and Vietnam will also share their lessons. For Malaysia, the representative belongs to the Kanpong Bahru (MAS: Malaya Agriculture Settlement Board), which is a urban village in Kuala Lumpur. This is a traditional Malaya settlement, and the MAS is the key organization to unertake development activities in the area. For Indonesia, the participant belongs to the BAPPEDA (planning and development department) of Bantul, Yogyakarta. She will be responsible for the recovery program of the recent earthquake in Yogyakarta. For Vietnam, it is the commune vice-Chair in Danang, one of major developing cities in the country. She is responsible for a joint collaborative project on environmental education in association with the Kyoto University GSGES. Malaysia, Indonesia and Vietnam has its own characteristic feature, and the actions at local levels will be different in each country.

The key issue, however, is the participation of local communities in risk reduction measures. Thus, there are immense opportunities to learn from each other's experiences.

Academic and research organizations play a vital role in risk reduction in communities through their action research. Bangladesh Cater for Advanced Studies (BCAS) is one of the pioneering action research group in Bangladesh, and has done innovative research in the field of environmental management. Nepal Engineering College is a growing institution and dedicated to the risk reduction activities in and around Nepal. Kyoto University Graduate School of Global Environment Studies is dedicated to innovative research, education and implementation in the field of environment, development and disaster management. All these institutions play vital role in risk reduction, and promote action research and field practices.

Civil Society bodies are the key to the success of grass-root initiatives in developing and developed countries. SEEDS, a professional NGO based in Delhi, and having braches in different parts of India and Kobe, Japan, is a front runner in this regard. SEEDS has been involved in innovative projects of community based risk reduction. Center for Disaster Preparedness (CDP) is also an experienced professional NGO, based in the Philippines, and having operations in different parts of East and South East Asia. CECI, a Canadian non-profit organization is serving different parts of Vietnam through innovative projects on climate change impacts and urban risk reduction. Thailand Environmental Institute (TEI) is a NGO for environmental management, and has a strong professional group on different topics, coastal environment, urban environment, environmental education etc. Presence of different NGOs from different parts of Asia will be mutually beneficial. OYO Corporation is one of the major consulting firms in Japan, with immense experiences of risk reduction initiatives in Japan and abroad.

International organizations like UNEP, JICA, ACCU play crucial role in international and local development for risk reduction. UNEP-IETC plays the important role in environment and disaster management, and JICA, through its bilateral cooperation implement projects in developing countries. ACCU plays an important role in the education field, and provide regular training programs in different parts of Asia and Pacific region.

Therefore, the participants represent a diverse group of organizations and institutions, which has different mandates and roles in risk reduction. To promote effective risk reduction initiatives, it is of utmost importance that the organizations come closer, and work together to provide innovative and appropriate solutions at local, national and international levels. The current training program is a unique opportunity for this.

7. Learning Process

The learning process of the training workshop has three different parts:

- ***Training Program:*** The training program will consist of six modules: *Risk Assessment, Action Planning, Decision Making, Implementation Management, Education for Sustainable Development and Information and Communication Management.* Each module have two parts: one descriptive part, which will describe the essential parts of the module; and the other discussion and lessons sharing part. In the second part, there will two case study

presentations, one from Japan, and other from abroad. Following the presentation, there will be group discussion. Three groups will be formulated: government, non-government and community. The group discussion will be presented in the plenary. Thus, the main training program will be interactive.

- Video Conference: To share the lessons from different countries, a video conference will be conducted with Kyoto, Tokyo, Manila, Bangkok and Delhi. The participants will be present in Kyoto, while different stakeholders will be present in different countries. They will share the lessons, and discussions will be made based on the presentation.

- Open Forum: Other important part of the training program is sharing the lessons with the common people and communities. In this regard, an open forum will be organized, which will consist of a series of key note lectures and a panel discussion. The key note lecture will focus on the lessons of innovative projects in different parts of Japan, followed by a panel discussion, where Mayors of two cities: Saijo and Galle will present their views, followed by comments and suggestions from the floor.

8. Expected output and outcome

Expected output will be a training module for Urban Risk with specific focus on the six different modules described above. This training module will consist of six module descriptions, case studies, and discussion results.

The long term expected outcome is trained professionals, who will return to their respective cities, and will utilize the training materials for actual implementation. This is the most important part of the training program, and therefore an evaluation and discussion on the follow-up activities will be made on the final day of the event.

9. About the Organizers

9.1 Kyoto University Graduate School of Global Environmental Studies focuses on pro-active and field-based education for sustainable development. The graduate school is organized flexibly so as to meet the various needs of research and education on inter-disciplinary topics (http://www.ges.kyoto-u.ac.jp/). The research field of International Environment and Disaster Management targets to reduce the gap between knowledge and practice through pro-active field-level, community-based project implementation(http://www.iedm.ges.kyoto-u.ac.jp/). Working closely with the governments, non-governments (NGO/ NPO), international organizations (United Nations and other bilateral and multilateral development agencies) and regional bodies, this research field is developing a unique process-oriented participatory approach of environment and disaster management through direct involvement and ownership of the community.

9.2 UNEP IETC promotes and implements environmentally sound technologies (ESTs), including management systems, for disaster prevention, production and consumption and water and sanitation. Keeping the entire disaster cycle in mind (Prevention, Mitigation, Preparedness, Response, and Recovery/Rehabilitation), IETC's programmes and projects under the disaster management pillar will focus on disaster prevention. The goal of IETC's

disaster pillar is to strengthen the cyclical interrelationships between sound environmental management and disasters preparedness, by implementing pilot projects and demonstrations of strategies (http://www.unep.or.jp/ietc/).

9.3 SEEDS is a voluntary organization registered under the Societies Act of India.
SEEDS was formed in 1994 as an informal group of students and pedagogues of the School of Planning and Architecture, New Delhi, whose common interests brought them together and made them carry human habitat environment related exercises beyond set academic targets. The SEEDS team comprises a group of young professionals drawn from development related fields. In addition, there is a panel of senior associates and young volunteers facilitating the various programs. Since its inception, SEEDS has been working on the path to the ideal habitat for communities – a habitat that is sustainable and safe (http://www.seedsindia.org).

9.4 The Asia/Pacific Cultural Centre for UNESCO (ACCU) is a non-profit organization for Asia and the Pacific regional activities in line with the principles of UNESCO, working for the promotion of mutual understanding and cultural cooperation among peoples in the region. ACCU was established in April 1971 in Tokyo through joint efforts of both public and private sectors in Japan. In July 1971 the resources and activities of the Tokyo Book Development Centre (TBDC), which had since its establishment in March 1969 been engaged actively in book development in Asia, were transferred to ACCU. ACCU has since been implementing various regional cooperative programmes in the fields of culture, education and personnel exchange in close collaboration with UNESCO and its Member States in Asia and the Pacific (http://www.accu.or.jp/en/).

(Appendix C) Open Forum agenda and schedule
International Symposium on
Risk Education for Sustainable Urban Environment

Organized by:
Kyoto University Graduate School of Global Environmental Studies
United Nations Environment Programme (UNEP)
SEEDS
ACCU (Asia Pacific Cultural Center of UNESCO)

Supported by :
Yomiuri Shimbun

Date: 29th of July 2006
Venue: Siran Kaikan, Kyoto University

Background:
Urban environment is gradually getting more complex, with interplay of different issues of population pressure, migration from rural areas, excess resource utilization, and improper land-use etc. Consequently, the urban environment is increasingly becoming vulnerable for people. To reduce the impacts on urban environment, while governance has a strong role to play, the role of people and communities in protecting their own neighborhood is of utmost importance. Education and learning has a strong role to play in this context.

Purpose of the Workshop: The workshop will aim at discussing three specific issues of urban risk: urban disaster management, urban environmental management, and education and learning. Expected participants are practitioners from different countries, residents and communities, and students.

Agenda:

13:00-13:30 **Opening Session**
- 13:00-13:15 Welcome Remarks: Toshio Yokoyama, Vice President, Kyoto University
- 13:15-13:30 Opening Remarks: Hari Srinivas, Chief, UEMU, UNEP-IETC

13:30-14:45 **Keynote Speeches**
- 13:30-14:00 Sustainable Community Risk Management: Case of "Chizu Initiative", Norio Okada, Professor, Kyoto University
- 14:00-14:30 Risk Management for Sustainable Wooden City: Masami Kobayashi, Professor, Kyoto University
- 14:30-14:45 Questions and Comments

14:45-15:00 *Coffee Break*

15:00-17:00 **Panel Discussion:** Towards Sustainable Urban Environment

Moderator: Rajib Shaw, Associate Professor, Kyoto University

Panelists:
- Kotaro Ito, Mayor, Saijo City
- MD. Ismail MD. Ariff, Mayor Galle City, Sri Lanka
- Takaya Kawabe, Director General and President, Ar-Tech

Commentator:
- Ian Davis, Visiting Professor, Cranfield University, UK
- Manu Gupta, Director, SEEDS

17:00 Adjourn

(Appendix D)

List of participants, resource persons, and staffs

Appendix D. List of participants, resource persons,and staffs

Participatory Urban Risk Management: Action Workshop on Education for Sustainable Development 23-30 July 2006 Kyoto, Japan

Name	Title	Organization	Division	Address	Country	Tel	Fax	Email
MD. Golam Rabbani	Senior Research Officer	Bangladesh Centre for Advanced Studies	Environment and Climate Change	House-10, Road 16A, Gulshan-1, Dhaka	Bangladesh	+880-2-885-1237	+880-2-885-1417	golam.rabbani@bcas.net
Anshu Sharma	Director	SEEDS		D-11, Panchsheel Enclave, New Delhi - 110017	India	+91-11-2649-8371	+91-11-2649-8372	anshu@seedsindia.org
Manu Gupta	Director	SEEDS		D-11, Panchsheel Enclave, New Delhi - 110017	India	+91-11-2649-8371	+91-11-2649-8372	manu@seedsindia.org
Fenty Yusdayati	Chief	Land Use and Setttlement	Regional Development and Planning Office (BAPPEDA) Kabupaten Bantul, Yogyakarta, Indonesia	Parasamya Office Complex, JL. RW. Monginsidi No. 1 Bantul, Yogyakarta	Indonesia	+622-74367533	+622-74367796	fentyus@yahoo.com
Takaya Kawabe	Director General and President	ArTech		Tomigaya 1-39-2, Suite 104 Shibuya-ku, Tokyo, 151-0063	Japan	+81-3-3467-6250	+81-3-3467-6277	kawabe@artech.or.jp
Hiroshi Mizoguchi	Director	City of Kitakyushu	Office for International Environmental Cooperation	Jonai 1-1, Kokurakita-ku, Kitakyushu, 803-8501	Japan	+81-93-582-3804	+81-93-582-2196	hiroshi_mizoguchi01@mail2.city.kitakyushu.jp
Hidetomi Oi	Senior Advisor	Japan International Cooperation Agency	Global Environmental Department	Shinjuku Maynds Tower, 2-1-1 Yoyogi, Shibuya-ku, Tokyo 151-8558	Japan	+81-3-5352-5616	+81-3-5352-5348	Oi.Hidetomi@jica.go.jp
Kenta Ono	Officer	Japan International Cooperation Agency	Global Environmental Department	Shinjuku Maynds Tower, 2-1-1 Yoyogi, Shibuya-ku, Tokyo 151-8558	Japan	+81-3-5352-5259	+81-3-5352-5348	Ono.Kenta@jica.go.jp
Kazuhiro Ueda	Professor	Kyoto University	Graduate School of Global Environmental Studies	Yoshidahonmachi, Sakyo-ku, Kyoto 606-8501	Japan	+81-75-753-3439		ueta@econ.kyoto-u.ac.jp
Masami Kobayashi	Professor	Kyoto University	Graduate School of Global Environmental Studies	Yoshidahonmachi, Sakyo-ku, Kyoto 606-8501	Japan	+81-75-753-5773		mkoba@archi.kyoto-u.ac.jp
Masashi Kamon	Dean	Kyoto University	Graduate School of Global Environmental Studies	Yoshidahonmachi, Sakyo-ku, Kyoto	Japan	+81-75-753-9188		kamon@mbox.kudpc.kyoto-u.ac.jp
Norio Okada	Professor	Kyoto University	Disaster Prevention Research Institute	Gokasho, Uji, 611-0011	Japan	+81-774-38-4035		n_okada@drs.dpri.kyoto-u.ac.jp
Rajib Shaw	Associate Professor	Kyoto University	Graduate School of Global Environmental Studies	Yoshidahonmachi, Sakyo-ku, Kyoto 606-8501	Japan	+81-75-753-5708	+81-75-753-5708	shaw@global.mbox.media.kyoto-u.ac.jp
Toshio Yokoyama	Vice President	Kyoto University		Yoshidiahonmachi, Sakyo-ku, Kyoto 606-8501	Japan	+81-75-753-9202		yokoyama@zinbun.kyoto-u.ac.jp
Masayoshi Ogawa	Project Coordinator	LEAF		8-1 Kouhuen 1cho-me, Nishinomiya	Japan	+81-798-69-1185	+81-798-69-1185	ogawa21@nishi.or.jp
Koki Onari		Nishinomiya City	Environmental City Promotion Group	10-3 Rokutanji Nishinomiya, Hyogo 662-8567	Japan	+81-798-35-3821	+81-798-23-8164	oonari@nishi.or.jp
Fumio Kaneko	Chief Engineer	OYO International		Rokubancho Kyodo Bldg. 2F, 6 Rokubancho, Chiyoda-ku, Tokyo 102-0085	Japan	+81-3-5211-5181	+81-3-5211-5184	kaneko@oyointer.com
Hiroki Ito	Senior Staff	Saijo City	Construction Department	164 Akeyasiki, Saijo, Ehime Pref. 793-8601	Japan	+81-897-56-5151	+81-897-52-1230	
Koji Ishikawa	Senior Staff	Saijo City	Risk Management Department	164 Akeyasiki, Saijo, Ehime Pref. 793-8601	Japan	+81-897-56-5151	+81-897-52-1230	
Kotaro Ito	Mayor	Saijo City		Saijo, Ehime. 793-8601	Japan	+81-897-56-5151		
Kozo Takahashi	Senior Staff	Saijo City	East Fire Station	164 Akeyasiki, Saijo, Ehime Pref. 793-8601	Japan	+81-897-56-5151	+81-897-52-1230	
Tomoko Takahashi	Senior Staff	Saijo City	Citizen's Affairs Section (Tanbara General Branch Office)	164 Akeyasiki, Saijo, Ehime Pref. 793-8601	Japan	+81-897-56-5151	+81-897-52-1230	

Appendix D. List of participants, resource persons,and staffs

Participatory Urban Risk Management: Action Workshop on Education for Sustainable Development 23-30 July 2006 Kyoto, Japan

Name	Title	Organization	Division	Address	Country	Tel	Fax	Email
Yukiko Ito	Public Health Nurse	Saijo City	Public Health Center	164 Akeyasiki, Saijo, Ehime Pref. 793-8601	Japan	+81-897-56-5151	+81-897-52-1230	
Masanori Sugimoto	Head	Toyooka City	General Administration Division, Disaster Prevention Section	2-4 Chuo-cho, Toyooka, Hyogo	Japan	+81-796-23-1111	+81-796-24-2575	masanori-sugimoto@city.toyooka.lg.jp
Hari Srinivas	Chief of Urban Environment Unit	United Nations Environment Programme	Division of Technology, Industry and Economics	2-110 Ryokuchikoen, Tsurumi-ku, Osaka	Japan	+81-6-6915-4594	+81-6-6915-4530	hari.srinivas@unep.or.jp
Mashuti Bin Mat Soom	Board Member	Malay Agricultural Settlement Administration	Board of Management	Bangunan Dewan Serraguna, No. 70, Tingkat 1, Jalan Haji Hashim/Jalan Hamzah, Kampung Baru 50300, Kuala Lumpur	Malaysia	+603-2692-5220	+603-2692-5220	farima_99@yahoo.com
Jishnu Kumar Subedi	Vice Principal	Nepal Engineering College	Civil Engineering	Changunarayn VDC, Bhaktapur, GPO Box: 10210, Kathmandu	Nepal	+977-1-6614720	+977-1-6611681	jishnusubedi@gmail.com
Lorna Paras Victoria	Director	Center for Disaster Preparedness Foundation, Inc.		CSWCD Bldg, Magsaysay Ave., University of the Philippines, Diliman, Quezon City	Philippines	+632-9266996	+632-9287285	oyvictoria@yahoo.com
Mohamad Ismail Mohamad Ariff	Mayor	Municipal Council of Galle		Municipal Council, Galle	Sri Lanka	+94-91-2234276	+94-91-2232702	mayorismail@hotmail.com
Ampai Harakunarak	Director	Thailand Environment Institute	Environmental Education and Human Resource Develop	16/151 Muang Thong Thani, Bond Street, Tambon Bangpood, Amphur Pakkred, Nonthaburi Province 11120	Thailand	+66-2-503-3333 (ext.322)	+66-2-503-3333 (ext.301)	ampai@tei.or.th
Ian Davis	Visiting Professor	Cranfield University, RMCS	Cranfield Mine Action & Disaster Management Centre	97 Kingston Road, Oxford, OX2 6RL	UK	+44-1865-556473		i.davis@n-oxford.demon.co.uk
Nguyen Thi Minh Thu	Translator	CECI	Danang Office	44 Bui Xuan Phai, Danang City	Vietnam	+83-511-540-107	+83-511-540-107	
Le Thi Thuan	Vice Chairman	Thuan Phuoc Ward People's Committee	Environment Division	No.88, Dong Da Street, Thuan Phuoc Ward, Hai Chau District, Danang City	Vietnam	+84-511-822-552		lethuan130279@yahoo.com
Gaby Breton	Team Leader	CECI	Danang Office	44 Bui Xuan Phai, Danang City	Vietnam/Canada	+84-511-540-107	+84-511-540-107	gabybreton@hotmail.com

Appendix D. List of participants, resource persons, and staffs

Participatory Urban Risk Management: Action Workshop on Education for Sustainable Development 23-30 July 2006 Kyoto, Japan

Name		Organization	Division	Email
Akhilesh Kumar Surjan	Rapporteur	Kyoto University	Graduate School of Global Environmental Studies	akhilesh@global.mbox.media.kyoto-u.ac.jp
Aya Okada	Translation	Kyoto University	Graduate School of Global Environmental Studies	ayaoct1@yahoo.co.jp
Chiho Ochiai	Translation/MC	Kyoto University	Graduate School of Global Environmental Studies	chiho118@yahoo.co.jp
Koichi Shiwaku	Secretariat	Kyoto University	Graduate School of Global Environmental Studies	shiwaku@ges.mbox.media.kyoto-u.ac.jp
Miwa Imura	Secretariat	Kyoto University	Graduate School of Global Environmental Studies	miwa321@hotmail.co.jp
Phong Tran	Rapporteur	Kyoto University	Graduate School of Global Environmental Studies	giaiphong@z05.mbox.media.kyoto-u.ac.jp
Prabhakar SVRK	Rapporteur	Kyoto University	Graduate School of Global Environmental Studies	sivapuram.prabhakar@gmail.com
Tomoko Sato	Secretariat	Kyoto University	Graduate School of Global Environmental Studies	hiyohiyo77@hotmail.com
Tomoko Tago	Secretariat	Kyoto University	Graduate School of Global Environmental Studies	tago@z05.mbox.media.kyoto-u.ac.jp
Yuki Yoshida	Secretariat	Kyoto University	Graduate School of Global Environmental Studies	jewelrydrop@yahoo.co.jp
Yuko Nakagawa	Secretariat	Kyoto University/ SEEDS Asia		yuko@seedsasia.org

(Appendix E)

Newspaper article

Yomiuri Shimbun

讀賣新聞

国際シンポジウム「住み続けたい町のリスク学」

日時　7月29日（土）午後1時
会場　京都大吉田キャンパス・芝蘭会館（京都市左京区）

世界各地で大規模な災害が相次ぐ中、国内外の専門家らが、環境問題の解決法を探ることを通じて都市防災のあり方について考えます。環境、防災に関心のある住民や学生らの幅広い参加を募ります。無料。

◇基調講演

「持続的なコミュニティリスクマネジメント 鳥取・智頭のまちおこしの事例より」岡田憲夫氏（京都大学防災研究所教授）

「木製都市の危機管理」小林正美氏（京都大学大学院地球環境学堂教授）

◇パネルディスカッション「持続可能な都市環境づくりにむけて」

△司会▽ラジブ・ショウ氏（京都大学大学院地球環境学堂助教授）

△パネリスト▽伊藤宏太郎氏（愛媛県西条市長）、モハメド・アリフ氏（スリランカ・ゴール市長）、河邊隆也氏（国際芸術技術協力機構理事長）

△コメンテーター▽イアン・デイビス氏（英国・クランフィールド大学客員教授）、マヌ・グプタ氏（インドNGO「SEEDS」所長）

【主催】京都大学大学院地球環境学堂、国連環境計画国際環境技術センター、SEEDS、ユネスコ・アジア文化センター

【後援】読売新聞大阪本社

（2006年7月20日） 20 July 2006

環境・防災教育考えよう

京大院、24日から ワークショップ 12か国の専門家集う

インドネシアのジョクジャカルタで、NPO関係者から住宅再建について学ぶ住民ら。ワークショップでは防災教育の大切さを考える（ラジブ助教授提供）

世界12か国の環境、防災の専門家やNGO代表ら約30人が集い、防災について考える国際ワークショップ「参加型都市リスク管理にむけて」が24～29日、左京区の京都大吉田キャンパスで開かれる。京都大大学院地球環境学堂などの主催。最終日の29日は公開シンポジウム（読売新聞大阪本社後援）も行う。

国連が推奨する「持続可能な開発のための教育（ESD）」の実現を目指して開催。環境、防災対策を施すうえでの教育の可能性や重要性を考える。

初日は、キャンパスとマニラなどの海外3会場を結び、環境と防災についての意見交換をするビデオ会議を実施。25日は、兵庫県豊岡市の防災担当職員もワークショップに加わり、グループ討議をする。26日は環境学習が盛んな同県西宮市の自然環境センターなどを視察する。

29日の公開シンポジウムは午後1時からで、京大・芝蘭会館で「住み続けたい町のリスク学」と題して開催。京都大防災研究所の岡田憲夫教授や京都大大学院地球環境学堂の小林正美教授が講演、続いて同地球環境学堂のラジブ・ショウ助教授の司会で、2004年に起きたインドネシア・スマトラ沖地震の状況などを踏まえ、パネル討議「持続可能な都市環境づくりにむけて」を行う。

ラジブ助教授は「インドネシアでは地震による津波の影響が今も農業や漁業に残り、深刻だ。ワークショップは防災に向けた教育の大切さを多くの人と考える機会にしたい」としている。

（2006年7月22日） 22 July 2006

環境と防災考える 国際研究集会開幕

京都

アジア太平洋地域を中心に12か国の環境、防災の専門家ら約30人が集まり、地球温暖化などの環境問題と災害の被害拡大の因果関係を考える国際研究集会「参加型都市リスク管理にむけて」（京都大大学院地球環境学堂など主催）が24日、京都市左京区の京都大吉田キャンパスで始まった。29日の最終日には同キャンパスの芝蘭会館で、国際シンポジウム「住み続けたい町のリスク学」（読売新聞大阪本社後援）が開かれる。

開会式でユネスコ・アジア文化センターの飯田和郎理事が「今回の会合がアジアを中心に災害防止を考えるきっかけになるようにしたい」とあいさつ。岡田憲夫・京都大防災研究所教授や植田和弘・同大大学院地球環境学堂教授が基調講演した。

（2006年7月24日）（夕）

24 July 2006 (Evening news)

京大で国際研究集会

専門家30人 活発に討議

防災に向けて積極的に意見を述べる参加者たち

京都大（左京区）で24日に始まった国際研究集会「参加型都市リスク管理にむけて」（京都大大学院地球環境学堂など主催）で、参加した世界12か国の環境、防災の専門家約30人は初日から、環境問題や都市災害について活発に意見を交わした。京都大と海外を結んで都市の危機管理を考えるビデオ会議もあり、NGOや地域住民が積極的にかかわる必要性を指摘する声が相次いだ。

午前中の基調講演では、京都大防災研究所の岡田憲夫教授が阪神大震災の教訓を例に挙げ、「地域住民が助け合う自助・共助、防災の意識を継続的に持ち続けることが重要」と強調。京都大大学院地球環境学堂の植田和弘教授は公害を災害ととらえ、問題解決の政策決定には「一般住民が参加し議論を深める場をつくることが大切だ」と訴えた。

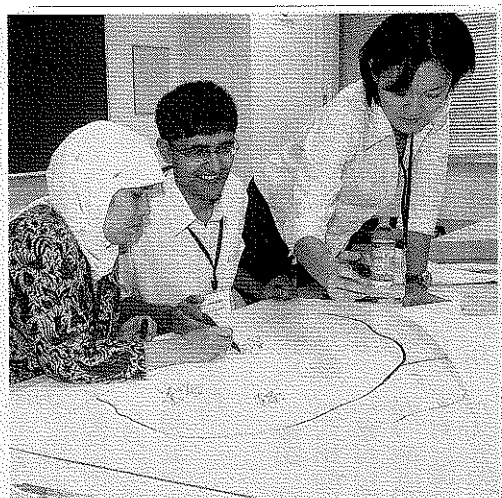
ビデオ会議は国内外4会場と同時に実施し、京都大以外の会場にはNGO代表ら7人が参加。京都大会場の英国・クランフィールド大学のイアン・デイビス客員教授が情報共有など防災の課題を指摘した。

（2006年7月25日）

25 July 2006

水害時の情報伝達説明

国際研究集会2日目 分科会では防災考える



分科会で大きな紙に架空の地図を描き、防災対策を考える参加者ら

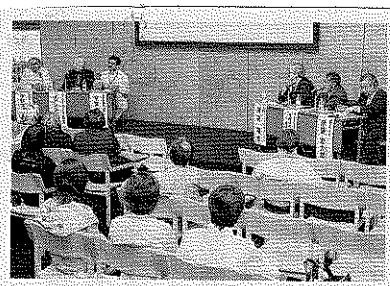
京都大（左京区）で開催中の国際研究集会「参加型都市リスク管理にむけて」（京都大大学院地球環境学堂など主催）2日目の25日、兵庫県豊岡市の杉本正憲・防災課長が水害時の情報伝達の難しさについて発表し、分科会では環境や防災の専門家約30人が防災をテーマに、行政や民間活動団体（NGO）、コミュニティーの3班に分かれて話し合った。

杉本課長は、同市で7人の犠牲者が出た2004年10月の台風23号の被害に触れた後、当時、防災無線で住民らに避難勧告・指示を繰り返したが、的確な避難誘導ができなかった状況を説明した。

その後の意識調査で、27・5％の住民が「避難勧告を聞いても危険と思わなかった」と回答したことを紹介したうえで、情報を伝達する際は「受け手の住民が状況の変化を理解しやすいように伝えることが大切」と強調した。ネパールの大学関係者からも「耐震性に無関心な建築業者が多く、防災教育が必要だ」などと訴える発表をした。

一方、分科会では大きな紙に架空の山や河川を描いて、様々な災害の発生を想定し、防災対策を考える参加者の姿が目立った。

（2006年7月26日）
26 July 2006



町の防災 活発討議

京大で国際シンポ

京都大吉田キャンパス（京都市左京区）を中心に開かれていた国際研究集会は最終日の29日、都市防災のあり方について考える国際シンポジウム「住み続けたい町のリスク学」（京都大大学院地球環境学堂など主催、読売新聞大阪本社後援）が同キャンパスの芝蘭会館で開かれ、国内外の環境、防災の専門家らによる活発な討議に、市民ら約100人が聞き入った＝写真。

京都大防災研究所の岡田憲夫教授は「災害の被害を最小限にとどめるには地域の連携が必要」と強調。地球環境学堂の小林正美教授は江戸時代の大火の歴史を紹介、木造住宅が密集する都市の危険性を指摘した。

続いて伊藤宏太郎・愛媛県西条市長やスリランカ・ゴール市のモハメド・アリフ市長ら6人が「持続可能な都市環境づくりにむけて」をテーマにパネル討議。アリフ市長は約2000人の犠牲者を出した2004年の津波被害からの復興状況などを説明した。

（シンポジウムの詳報は8月中旬に掲載します）

（2006年7月30日） 30 July 2006

国際シンポジウム　住み続けたい町のリスク学

都市防災のあり方を考える国際シンポジウム「住み続けたい町のリスク学」が7月29日、京都市左京区の京都大・芝蘭会館で開かれた。基調講演に続いてパネリスト3人の報告があり、愛媛県西条市の伊藤宏太郎市長は2004年の台風被害を教訓に取り組む防災対策、スリランカ・ゴール市のモハメド・アリフ市長は同年末、津波に襲われた町の惨状と復興の様子、国際芸術技術協力機構の河邊隆也理事長は防災教育の重要性を語り、海外の専門家が意見を述べた。

都市防災　住民が主役

パネルディスカッション

持続可能な都市環境づくりにむけて

教育で頼りになる12歳

伊藤宏太郎氏（愛媛県西条市長）

西条市は一昨年の台風で5人が死亡したため、今年4月に市民安全部を創設し、防災マップを全4万6000戸に配った。市面積の7割は急峻な山地。防災の基本「死ぬな。逃げろ。助けろ」を徹底し、「防災文化」を共有して強い地域社会をつくるため、災害を想定した図上訓練もしている。

地元の西条祭りではだんじり約170台が繰り出す。各地域の祭りを核としたネットワークが根付いており、災害時に役立つ。地域連携の強さを「だんじり防災」として活用したい。

今年度からは防災教育に重点を置き、小学6年への12歳教育を始めた。家にいる時間が多く、地域に対する判断もすばらしいので親の外出時は頼りになる。今年の夏は児童代表が兵庫県の淡路島で防災学習をし、来年2月には市内の小学6年約1270人を一堂に集めて防災の報告をしてもらう。

コメンテーター　イアン・デイビス氏

意識向上に有効

12歳児への防災教育は、防災意識の向上には有効だ。ただ、学校外で何か起きた時の対応は考えないといけない。英国では7歳までに泳ぎを覚える。自らを守るためで、災害時に子どもは被害を受けやすく、世界中でより安全な学校環境に腐心しなければいけない。

リーダーシップをとる市長の姿もわかり、興味深い発表だった。西条市の経験・知識を広くほかの人たちと共有してほしい。

子に自己管理教えよう

河邊隆也氏（国際芸術技術協力機構理事長）

災害への適切な対応には、▽一人ひとりが自立する▽コミュニティーで助け合う▽国、国際レベルで救助する——の3要素が求められる。子どもの時から自立できる力をつけようと作ったのが「Kids ISO」のプログラム。対象はアイデンティティーの生まれる10歳で、子どもが将来、希望を持てるようにするのが目的だ。早くから自分で自分の面倒を見られるセルフマネジメント（自己管理）を教えることが一生を左右する。

プログラムは入門編から初級、中級、上級編で構成。インストラクター、教師向けの専用ガイドブック、教材も用意している。欧米や神戸市、大阪の枚方、羽曳野の両市、京都市でも幾つかの小中学校が取り入れている。6年前に始め、毎年4～5万人の子どもが節水を心がけるなど環境活動で効果が出ている。二酸化炭素の排出は10～15％減り、国内の総計で4万トンを削減できた。

コメンテーター　イアン・デイビス氏（英国・クランフィールド大学客員教授）

教育は一番の備え

ある専門家が、防災に対する一番の武器は、備えのできたコミュニティーと指摘していた。そのためには、まず子どもへの取り組みから始めることが大事で、河邊さんが10歳に焦点をあてて取り組んでいることはとても重要だ。今子どもにできることはやはり教育で、いい備えになるはずだ。教育は将来への投資で、私たちが今はわからない問題に対しても20年、30年たてば対応することができるようになる。極めて重要なテーマを取り上げてもらった。

津波　海外支援に感謝

モハメド・アリフ氏（スリランカ・ゴール市長）

津波で、ゴール市では2000人を超える人が亡くなり、約2500人が家を失った。商業の中心地は破壊され、現地は湖のようだった。学校や寺、モスク、教会を避難所にした。3、4週間、電気はなかった。約1週間後、シンガポールや韓国などの医療チームが駆けつけ、消毒用の薬を散布したので、災害後の感染病は防ぐことができた。

中央政府は防災対策本部をつくり、復興計画を決めた。道路などのインフラ整備、市場の整備は外国やNGOの支援で行った。特に感謝したいのは高速道路建設のプロジェクトを助けてくれた日本の企業だ。大きな橋の復旧もしてくれた。

政府は防災の新しい省をつくり、市レベルでは学校で子どもの防災、環境の教育にあたった。

コメンテーター　マヌ・グプタ氏（インドNGO「SEEDS」所長）

復興で災害に強く

スリランカは過去に大きな津波被害がなく、住民はパニックを引き起こしたに違いない。その中で市長は大勢の死者、被災者にどう対応するかが問題だった。2000人の遺体をいかに尊厳を持った形で確認し、遺族に戻すかは難しく、心情的につらかったと思う。

復興は大変だ。単に日常生活に戻るだけでは十分でなく、災害に強い地域社会をつくる必要がある。弱き者すべてに手を差し伸べることと対話が必要。将来を担う世代への教育も重要で、学校を防災の出発点にすることが大切だ。

基調講演＊持続的なコミュニティリスクマネジメント　鳥取・智頭のまちおこしの事例より

命、地域守る自活力大切

岡田憲夫氏（京都大学防災研究所教授）

鳥取県智頭町は、岡山県と接する人口約1万人の町。高齢化が進んでいたが、約20年前に町おこしのために建てた特産の杉のログハウスなどが人気を集め、キャンプ客ら年間1万5000人が訪れ、今や「杉の木村」として有名になった。

注目されるのは1997年度に町が制度化した「日本ゼロ分の1村おこし運動」。旧態依然とした社会の変革を図り、一人ひとりが一歩踏み出すことで町を活性化させる、住民の自立と共育のマネジメントだ。各集落は描いた将来像を基に交流している。災害時に避難所として使えるあずま屋を建て、他地域と交流を図っているところもある。

行政任せはいけない。自分たちで命、地域を守る自活力をつけることが大切。自分たちでできない時は、ほかの人と協調して対応することが必要だ。

基調講演＊木製都市の危機管理

改修重ねて常に用心を

小林正美氏（京都大学大学院地球環境学堂教授）

木と紙でできている木製都市は大変燃えやすい。江戸時代には、幕府関係の建物だけの消火活動にあたる「常火消し同心」と、町家の消火にあたる「町火消し」の2種の消防組織があったが、いずれも建物を壊して延焼を食い止める破壊消防が主だった。

このため都市計画は道幅を広くして火よけ地を設けたり、土手をつくったりして火事が広がらないように練られた。その後、関東大震災や東京大空襲の経験を踏まえ、延焼をどうやって防ぐかが都市計画の安全設計方法で、モルタル塗などが京都にも増えた。

しかし、1995年の阪神大震災でモルタル塗などの防火対策が地震には弱いということがわかり、地域防災への意識が高まった。常に用心をして修理を加え、油断しないことが、木製都市の危機管理となる。

良い仕組み　まず地域から　——総括

ラジブ・ショウ氏（京都大学大学院地球環境学堂助教授）

シンポジウムから四つの重要な教訓を学んだ。まず環境、災害管理、防災に関する問題の解決策を見いだすため、問題をプラスにとらえること。二つ目は、安全な都市づくりのため、地域の中心的な人物を探すこと。そのためには将来の主役、子どもたちへの教育が重要といえる。3点目はセルフマネジメントで、最後は政策の実施だ。政府を立案したものはコミュニティーに実施してもらうが、政治体制や為政者が変わっても継続できる仕組みを作るためにも、住民に深く根づかせることが重要だ。

小さなコミュニティーで行っていることが全国に、国際的に広がっていく可能性はある。だからコミュニティーベースで良い仕組みをすることが第一で、それを外に広げていくことが大切だ。また近い将来、このような場で話し合いたい。

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