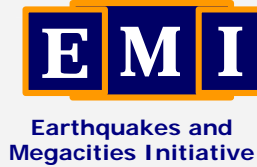


**Symposium on  
Disaster Risk Management for Megacities  
in Asia: Planning and Implementation**  
January 21-22, 2005  
Kobe International Conference Center  
Port Island, Kobe, Hyogo, Japan



**A contribution to the**



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## **SUMMARY REPORT**

This report presents the proceedings of a Thematic Session (TS1.10) and a symposium on Disaster Risk Management for Megacities in Asia: Planning and Implementation, which was organized by EMI (The Earthquakes and Megacities Initiative), Kobe University, and the Pacific Disaster Center at the World Conference on Disaster Risk Reduction (WCDR), which took place in Kobe, Japan on 18-22 January 2005. The Thematic Session and the Symposium were organized under the auspices of the International Strategy for Disaster Reduction and were sponsored by the United Nations Development Program (UNDP/BCPR), UN- HABITAT, Kobe City Municipal Government, and the World Bank Hazard Management Unit.

### **THEMATIC SESSION 1.10**

#### **ADDRESSING THE ROOT CAUSES OF VULNERABILITY OF HUMAN SETTLEMENTS IN MEGACITIES**

EMI - UN- HABITAT - UNDP - Kobe University - Pacific Disaster Center

A parallel Thematic Session of the WCDR (**Theme 1: Governance**)

20 January 2005

#### **Summary of the Session's Presentations and Discussions**

Rapid rural migration to already high-density urban areas has contributed to an alarming increase in vulnerability of megacities. Megacities are characterized by complex urban environment that results in high vulnerability of its population to various disasters. Risk from natural and human-induced disasters continues to increase due to these population increases combined with unplanned aging building stock and infrastructure, land use and unregulated construction, lack of attention to risks and hazards in the development process, weakness in governance, and lack of awareness among the population and its governing institutions.

Effective urban governance is as the heart of reducing disaster risk. All three factors that contribute to urban risk viz. hazard, vulnerability, and human settlement, are directly influenced by urban planning, enforcement of regulatory environments, improvement of social welfare and other acts of governance. While a lot of attention has been given to community level risk reduction, very little focus has been given to megacities which are prone to losses of catastrophic proportions.

Incorporating the principles and practice of disaster risk management in urban governance at all levels will reveal that major strides can be accomplished towards sustainable development and poverty reduction.

Five city managers and leading practitioners detailed their vulnerabilities and explored programs in place to reduce vulnerabilities:

- Development and implementation of disaster risk management master plans by some municipalities (e.g. Istanbul, Turkey) have produced positive impacts in governance practices both at the local and central levels, resulting in legislative reform, financial commitments, and policy implementation.
- Experiences in terms of assessing and reducing the vulnerability of slums and migrant populations. Case studies from Morocco illustrated the ubiquitous problems posed by traditional and historic housing types which are highly vulnerable to earthquakes, yet also have an important social, cultural and historical value. The presenting cities concurred that some ancient constructions are extremely vulnerable due to technical and financial difficulties; the case of ancient construction is particularly difficult to deal with because it has significant historical value but is very difficult and expensive to retrofit. Examples were discussed regarding programs that have been launched in recent years to reduce the concentration of population in ancient cities and to replace slums and illegal settlements with low-cost housing. These interventions demonstrate that major progress can be made in reducing the vulnerability of slums.
- The City of Quito described how it is dealing with acute unplanned urbanization and illicit construction that takes place on hazardous slopes subject to land erosion, landslide, and flooding. This illicit construction imposes significant strain on the city governance resources. It was shown that it is necessary to establish adequate institutional arrangements for prevention and crisis, for designing and implementing permanent policies related to risk prevention and mitigation, and establish appropriate legislation and control mechanisms. Cities must overcome weak institutions, leadership, and coordination to incorporate disaster prevention and crisis planning and develop adequate institutional frameworks.
- It was shown that leaders must provide institutional coordination to involve many community stakeholders for risk reduction to be institutionalized in megacities. The Municipality of Santa Fe de Bogotá provided its experience in using information technology not only for disaster risk assessment but also for risk communication, education and for involving stakeholders and policy makers in understanding their options in disaster risk reduction and the trade-offs involved in the policy and decision making process. It was shown that only through intervention in the political, economical, social and cultural processes can cities hope to reduce the risk generating factors.
- Finally, the cities demonstrated the value of community-based disaster-risk reduction programs to provide know-how through training and advocacy at the community level. In all these cities, it was found that local experiences positively impacted governance.
- A common feature of all risk reduction programs was their involvement of all the different stakeholders in planning and implementation process. Examples were shown how community involvement and ownership of the programs was a critical factor in their success.

This session highlighted the urgent need to bring effective disaster risk management to megacities in a program that incorporates the participation of interagency communication in both the public and private sector along with academic and international organizations.

#### **Primary issues**

- Governance issues related to the development and implementation of risk reduction plans.
- Risk assessment and risk communication
- Reduction of the vulnerability of slums, traditional housing, illicit constructions and migrant populations.

- Stakeholders' involvement in identifying and implementing risk mitigation options.

**Name, affiliation and contacts of presenters and titles of presentations:**

- **Metin Ilkisik**, Advisor to the Mayor, Istanbul Metropolitan Municipality, Turkey  
*“Governance issues related to the implementation of the Istanbul Earthquake Risk Reduction Plan”*.
- **Mohamed El- Malti and Ali Gueddira**, Director of Urban Planning, Ministry of Housing and Urban Planning, Kingdom of Morocco. *“Evaluating and reducing the vulnerability of slums, traditional housing, and migrant populations – Experience from Morocco”*
- **Arch. Diego Carrion**, Director of Dept. of Urban Planning, Quito Municipal Government, Ecuador. *Dealing with illicit construction – Experience from Quito.*
- **Fernando Ramirez**, Director of the Direccion de Prevencion y Atencion de Emergencias de Bogota DPAAE, Colombia. *Risk Assessment and risk communication – Developing policy and understanding trade- offs – Experience from Santa Fe de Bogota.*
- **Amod Dixit**, Executive Director National Society of Earthquake Technology, Nepal. *Stakeholders' involvement in Identifying and Implementing Risk Mitigation Options– Experience from Kathmandu.*

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**SYMPOSIUM: DISASTER RISK MANAGEMENT FOR MEGACITIES IN ASIA: PLANNING AND IMPLEMENTATION**

Friday 21 January 2005

The recent tsunami disaster illustrated the devastating extent that disasters may present. While the scale of this disaster was certainly massive, both in terms of damage and loss of human life, the impact of a similar hazard on a megacity would be catastrophic with losses that exceed anything witnessed by humanity to date. The danger is clear and present, and it is only a matter of time before a megacity receives a direct hit. The symposium provided an open forum to explore innovative and practical means of disaster risk reduction in megacities.

*Prof. Tanaka introduced the Symposium as a joint effort between EMI (Earthquakes and Megacities Initiative) and Kobe University. In June of 2004, the Research Center for Urban Safety and Security of Kobe University (called “RCUSS”) signed a memorandum of understanding with EMI to start & continue the collaborations on disaster mitigations between the two institutions over the next five years (i.e. 2004- 2009).*

**Introductory Remarks by Tomoyuki Nogami, President of Kobe University**

Just as EMI was established after the Great Hanshin- Awaji Earthquake to promote the mitigation of earthquake disaster work in the megacities of the world, RCUSS at Kobe University was also established, and is the only national & multi- disciplinary university located within the epicentral area of the Great Hanshin- Awaji Earthquake. Kobe University established this research center in 1996 to perform research towards building a safe and secure society. These two organizations have a common goal of reducing the terrible consequences of natural disasters, especially damage due to the earthquakes in megacities.

Kobe University supports activities in disaster mitigation through international collaboration and participation in multi- disciplinary academic work. Although the theme of the Symposium focuses on disaster mitigation in megacities of Asia, the principals can be applied universally. We applaud your efforts and welcome the participants to Kobe, Japan.

**Introductory Remarks by Satoru Nishikawa, Prime Minister Cabinet, Government of Japan**

There are so many disasters that claim lives and property. A single disaster has the capacity to wipe out the GDP of a country and there are many examples of natural disasters that have

contributed to significant drops in the GDP of nations worldwide. Models of an Istanbul earthquake suggest that 70,000- 80,000 people may lose their lives and the entire country will suffer a drop of 25% in its GDP. Natural disasters are the biggest obstacle to sustainable development and social security of a country.

To decrease the vulnerability of megacities requires the involvement of multiple sectors. Banking is one such sector that if involved in the risk reduction process may establish confidence in financial industries to invest in hazard prone locations. We cannot stop the hazards but we *can* reduce disasters.

The World Conference is an indication that we can do rehabilitation in the context of mitigation and prevention. However, only through the coordination of regional planning, social infrastructures, science and engineering and other sectors can this be accomplished.

*“Natural disasters will hit us [again] by the time people have forgotten about it”.*  
Dr. Torahiko Terada.

Risk information in terms of early warning and hazard mapping is vital for action. In this information age the media has taken on a major role in the dissemination of information. In Japan, tsunami warnings are issued to television within 5 minutes after an earthquake.

Natural disasters have still increased even after the Yokohama conference because regulatory measures on land use are not yet in place.

#### **Remarks from Fouad Bendimerad, Chairman of EMI**

The chairman reviewed the principles upon which EMI was founded and addressed the question he often receives from governments, “how can disaster reduction be accomplished?” The key is to integrate disaster risk management as part of the city planning and operation processes; this is the essence of mainstreaming. Also, cities can learn from each other and share experiences. As coalitions and partnerships are built, solutions to even the most challenging problems can be overcome.

Cities will only be successful if they plan diligently for disaster risk management, build the resources to support its implementation, and progressively integrate it in their planning, operation and functions. They need to master resources from within their own communities and engage universities, business, professional organizations and other civil society’s partners in the implementation of disaster risk management.

#### **PANEL 1: PLANNING FOR DISASTER RISK REDUCTION IN MEGACITIES**

**Moderator:** Ravi Sinha, Coordinator, Asia Cluster

**Rapporteur:** Sergio Puente, El Colegio de Mexico, Mexico City

#### **Panel issues:**

1. *How do cities develop disaster risk reduction plans?*
2. *What factors contribute to successful planning and implementation?*
3. *What factors present obstacles that must be overcome?*

The session began with a comprehensive presentation on the development of a Master Plan for disaster risk management in Istanbul. In response to the threat of a major earthquake, the city of Istanbul put substantial effort in the development of a plan that weaves risk assessments with infrastructure data, the identification of risk factors, legal issues and financial solutions.

The municipality created a Disaster Coordination Center to coordinate the activities of each government department that had any involvement with the plan.

Major risk sectors were identified such as incompatible land use, potential productivity losses, lack of emergency facilities, vulnerabilities to accidents, sabotage, terrorism, hi risk buildings, etc.

Legal issues were addressed in order to apply solutions. This involved the creation of a disaster law (to cover post events), construction laws, technical assessment and building retrofitting, city rehabilitation projects, and new laws to regulate the financing of these projects. There are also problems associated with planning (e.g. they are optional at a regional level). Some plans actually contradict each other as it happens in overlapping regions.

Bureaucratic obstacles and procedures indirectly contribute to illicit development. An efficient control mechanism still needs to be developed.

The Master Plan recommended updating the Development law to incorporate microzoning and stimulate best practices in engineering. The plan also called for the acquisition of data defining infrastructure such as natural gas lines. A Financial Model is in development that utilizes insurance, bonds, and other forms of creative finance. The Master Plan recognizes that risk mitigation is not just technical but requires a social solution as well.

The disaster management plan for Mumbai was then presented by Ravi Sinha and addresses earthquakes, cyclones, floods, industrial accidents, civil unrest, and terrorism. The plan was first made in 1998 and addresses the response system prepared by Municipal Corporation and approved by the State.

Some of the risks considered included stressed communication & transport systems, poor building stock, stressed law enforcement, high man-made hazard, high commuting population, burdened health care system, large migrant population (200 families per day come into city) leading to a 7 million inhabitant slum. Disaster management is not specified in the constitution nor is the division of responsibilities defined at local or central levels but it does fall under planning which is a government responsibility. Without a constitutional framework, pre-disaster activities have been difficult to plan. Planning is a political process, and the city is using a holistic all-hazard approach to identify short and long-term strategies.

A very detailed risk assessment was also presented by Hon. Bayani Ferenando for Metro Manila in collaboration with the government of Japan. This assessment highlighted the vulnerabilities of the city and found that vulnerability reduction is not only good for disaster management but also for development of the city. Good information, technology and education play critical roles in the success of the program.

**Name, affiliation and contacts of presenters and titles of presentations:**

- **Metin Ilkisik**, Advisor to the Mayor of Istanbul, Turkey “*The Study of the Istanbul Earthquake Master Plan*”.
- **Mahmut Bas**, Director, Office of Earthquake and Grounds, Istanbul Metropolitan Municipality. “*The Implementation of the Istanbul Earthquake Master Plan*”
- **Ravi Sinha on behalf of Mr. Johny Joseph**. Municipal Commissioner, Municipal Corporation of Greater Mumbai, India. “*Long-term Disaster Risk Management Plans for Mumbai*”.
- **Hon. Bayani Fernando**, Chairman, Metropolitan Manila Development Authority. “*Post JICA’s Metro Manila Earthquake Impact Reduction Studies: Planning the Next Steps*”.

**PANEL 2a: MODELS OF DISASTER RISK ASSESSMENT FOR MEGACITIES**

**Moderator:** Yasuo Tanaka, Professor, Kobe University

**Rapporteur:** Jeannette Fernandez, Pacific Disaster Center, EMI- 3cd Component 1 Coordinator

**Panel issues:**

1. *What are the most effective technologies for disaster risk assessment?*
2. *What is the community's role in developing disaster risk reduction plans?*
3. *How can megacities assess and strengthen their capacity for disaster risk reduction?*

The session reviewed a number of risk assessment studies and in each case Geographic Information Systems (GIS) were employed to gather data and manipulate it in a number of ways that enabled users to quickly grasp the risks in terms of the distribution of assets, seismic zonation, and population densities among other others. These systems can also provide rapid earthquake loss estimation and can act as decision support tools in response to earthquakes. Since GIS has become the platform of choice among users, there is a need to increase the exchange of information, data, and experience among users.

Prof. Yasuo Tanaka began the session with an instructive assessment of how risk assessment, risk management and risk communication all play important parts of an integrated strategy to reduce risks from natural hazards. Each of the risk components (assessment, management and communication) also contains a technological and sociological component which helps to bridge the gap between highly technical information and the nature of the users.

Dr. Jim Buika, PDC senior manager and PDC- EMI project monitor presented an application of the use of GIS Internet based map viewer as a powerful tool to communicate risk to different stakeholders. It could be used along with planning to make informed policies and mitigation strategies in the cities. Dr. Buika showed an application for Marikina city on, which showed a success story for flood mitigation, where certain areas of the city were given priority for development, avoiding and reducing recurrent flooding impact.

Prof. Jamil Choudhury outlined the steps that Dhaka is taking to reduce their risk to cyclones, storm surges, flooding, tornadoes and earthquakes. Mitigation is taking the form of a newly established earthquake society, enforcement of building codes, development of flood forecasting, evacuation centers (that often double as schools), an earthquake preparedness program that focuses on training, and the development of an earthquake management plan.

Dr. Yongan Nie from Tianjin- China pointed out the usefulness of loss and damage estimates tools that can be used immediately after an earthquake hits a city to facilitate Emergency Response and Rescue purposes. The presenter made special emphasis of the system being developed in Tianjin for this purpose.

Main conclusions can be summarized as follows:

- Technology by it self is not the solution; it is a powerful tool to help us all understand how risk is generated and its possible impact. Hazard assessment is one step in the DRM process. Key to its success are the means for available communication.
- There are available a number of useful IT tools, particularly GIS- based that help to visualize the distribution of risk and raise awareness at all levels. It is a powerful tool if used to promote planning and mitigation in the community.
- Data management and maintenance requires a lot of effort to keep updated. It could be a good idea to involve other actors to the process of collection and dissemination, such as the private sector and the community.
- Political will, community involvement and good technical capabilities to understand hazards are key factors to reducing disasters in the long run.

- Finally, it is important to look at appropriate technologies depending on the environment where they are going to be designed and used.
- **Yasuo Tanaka**, Professor, Kobe University. “*Integrated strategies for reducing risks and disasters in urban environments and RCUSS of Kobe University*”.
- **Jim Buika**, Senior Manager, Pacific Disaster Center, Maui Hawaii. PDC-EMI- project manager, “*Examples of the Application of GIS to Disaster Risk Reduction: Marikina City, Philippines*”
- **Prof. Jamil Choudhury**, Vice Chancellor, Brac University, Dhaka, Bangladesh. Director of Dept. of Urban Planning, Quito Municipal Government, Ecuador. “*Recent Developments in Disaster Risk Assessment and Vulnerability Reduction in Dhaka City*”.
- **Prof. Yongan Nie**, Earthquake Administration of Tianjin. “*Earthquake Disaster Risk Management and Reduction in Tianjin, China*”.

## **PANEL 2b: MODELS OF DISASTER RISK ASSESSMENT FOR MEGACITIES**

**Moderator:** Renato Solidum, Phivolcs, Metro Manila, the Philippines

**Rapporteur:** Nury Bermudez, Municipio Metropolitano de Quito, IT Director

Mr. Kitamura described how Kobe University has taken on a very proactive leadership role in acting as a hub of activity in urban disaster management linking researchers (locally and internationally) with NGOs, government, and international organizations.

Katalin Demeter gave an overview of a new project under development at The World Bank, an on-line Comprehensive Disaster Risk Management Framework. This online resource of distance learning tools will enable users to develop and implement a risk reduction agenda that is suited to their needs.

Shirley Mattingly described the unsustainable practices in urban sprawl that is leading to increased poverty and risk. The 3cd Program is a projected 6-year program designed to integrate disaster mitigation research and implementation in large, complex cities. This is done by engaging professionals from academia, government and NGO in implementing sound practices for disaster risk management. To date 20 cities are participating in the program. 3cd provides a mechanism for cities to enhance international relationships, determine what is working elsewhere in disaster management, and exchange information.

Stanley Goosby presented examples of sophisticated modeling to pinpoint high risk areas from tsunami. Critical to this kind of modeling is the information that is used in these models such as high resolution bathymetry or landform data.

### **Name, affiliation and contacts of presenters and titles of presentations:**

- **Stanley Goosby**, Senior Manager & Chief Scientist, Pacific Disaster Center. “*An Example of the Application of GIS to Disaster Risk Reduction: Marikina City.*”
- **Shirley Mattingly**, Program Director, 3cd Program, EMI. “*Engaging Stakeholders and Building Sustainability Mechanisms: The Cross-Cutting Capacity Development Program (3cd)*”.
- **Shinzo Kitamura**, Vice-President, Kobe University. “*Outreach Across Jurisdictions*”.
- **R.K. Singh**, Joint Secretary & Central Relief Commissioner, Ministry of Home Affairs. “*Institutionalization and Sustainability of Disaster Risk Management Initiatives in Urban Areas of India*”.
- **Katalin Demeter**, The World Bank. “*Mainstreaming Disaster Risk into Urban Capacity Building*”.

- **Andrew Maskrey**, Director, Bureau of Crisis Prevention and Recovery, UNDP. *“Global Perspective: United Nations Development Program”*.

### **PANEL 3: IMPLEMENTING SOUND PRACTICE: OVERVIEW OF 3CD PROGRAM**

**Moderator:** Shirley Mattingly, Director, 3CD program

**Rapporteur:** Irasema Alcántara- Ayala

#### **Panel issues:**

1. *What are the criteria for determining sound practice?*
2. *What factors inhibit/encourage the transfer of sound practices developed in one city to other cities?*
3. *How can sound practices developed in one city be shared with other cities?*

The session was started by Louise Comfort, who pointed out the main structure and objectives of the two main programs of EMI: the cluster cities and the 3CD programs. Both strategies imply the idea of what can be called a “*double s*” objective, which means the implementation of actions to achieve *sustainability* and *security* for our megacities, in other words, sustainable risk management.

The initial findings of the 3CD program were generally illustrated by Shirley Mattingly by specifying that the ongoing process involves the analysis of knowledge, capacity building and practice in terms of institutional risk assessment and communication, where key factors comprise not only learning and sharing, but the participation of researchers and stakeholders. In particular it was addressed that one of the limitations and challenges of the program is the actual implementation of a holistic approach for disaster risk management.

Neil Britton presented six points as the main criteria for determining sound practice that can be used for a megacity as a whole, considering sound practice as any proven idea, method, practice or procedure for assessing, managing and reducing risk in complex urban areas. Such criteria comprise: universality- transferability; applicability; expandability; orientation- focus; assimilation- integrability, and impact- effectiveness. Moreover, in order to reduce vulnerability through the implementation of sound practice, activities need to establish targets that consider sustainable, measurable, achievable, relevant and timely activities.

According to the presentation by Tony Fernandez, the degree of transference of experience or sound practices from one city to another is determined by their differences and similarities. The diversity and likeness of cities is expressed by several factors including facilities available (distance and time, computer access), communication, expectations, level of readiness, confusion of identities, etc.; meanwhile, in order to promote sound practice, support is needed in terms of political, financial, technical, administrative/management issues and the participation at local and national levels. One of the most important points of such process is mutual and experiential learning and the transference of strengths and use of opportunities among the partnerships and networks.

On the other hand, Jeannette Fernández talked about the methodology that has been followed in order to achieve the sound practice process, by providing information concerning the instruments used (City workshops, standardized data collection templates, city profiles formats, and sound practice report templates) and available information from the participant cities (Mumbai, Metro Manila, Kobe, Kathmandu, Dhaka, Bogotá, Quito, Los Angeles, Mexico City, Tashkent and Naples). According to the research done so far, there are several mechanisms to share information such as manuals, internet, CD rooms, staff exchange, study tours, training and so on, however, the most significant mechanism is with no doubt the exchange network of the cluster cities and the establishment of a smart knowledge base that can be accessed via the

Internet by different stakeholders in a megacity (which is underway as part of an EMI-PDC agreement).

One of the key ideas for any city concerning risk management from the perspective of a city representative was expressed by the Mayor of Marikina City, Ma. Lourdes Fernando, by saying there should not be panic announcements without an action plan since it affects economic development and is a major concern for investments. In terms of short-term natural hazard announcements by weather provides (or any other agency), city planners would like to receive alerts before the public does in order to enact a response and ensure public confidence that a situation is being properly managed. Mayor Fernando also recognized the significance of promoting education for the development of a culture of disaster prevention, and the need to decrease structural levels of vulnerability. In terms of technological implementation she pointed out that cities require representing the different risks on a single map by using GIS, in order to enhance public understanding and share a compilation of the practices developed by the city.

Finally, Ellis Stanley, the city representative of Los Angeles, addressed the significance of practice in terms of putting hands on and spending time in the field getting a picture of community emergency response training. He called upon the attention of factors such as exchange of skills and participation of stakeholders, regionalism, standards, and education at all levels.

**Name, affiliation and contacts of presenters and titles of presentations:**

- **Louise Comfort**, Professor, University of Pittsburgh, “*EMI’s Cluster Cities Program: Balancing Risk and Responsibility for Disaster Reduction in Megacities*”
- **Shirley Mattingly**, Program Director, 3cd Program, EMI. “*Implementing Sound Practice through the 3cd Program*”.
- **Neil Britton**, EdM- NIED, Kobe, Japan. “*What are the criteria for determining Sound Practices?*”
- **Tony Fernandez**, (EdM- NIED – Team 4- Japan)
- **Jeanette Fernandez**, Deputy Secretary General, Istanbul Metropolitan Municipality, Turkey “*Governance issues related to the implementation of the Istanbul Earthquake Risk Reduction Plan*”.
- **Arch. Diego Carrion**. Director of Dept. of Urban Planning, Quito Municipal Government, Ecuador. *Dealing with illicit construction – Experience from Quito*.
- **Prof. Rashidov**, Tashkent
- **Mayor Ma. Lourdes Fernando**, Mayor of Marikina City, Metro Manila, Philippines. *Feedback from Decision Makers*.
- **Ellis Stanley**, Emergency Management, Los Angeles. *Feedback from Decision Makers: Community Emergency Response Training*.

**CONTRIBUTORS TO THE REPORT**

- **Fouad Bendimerad**, EMI
- **Esteban Leon**, UN- HABITAT
- **Jim Buika**, Pacific Disaster Center, USA
- **Shirley Mattingly**, 3cd Program, EMI
- **Mike Kozuch**, geoForecaster, Inc., USA
- **Jeannette Fernandez**, Pacific Disaster Center, EMI- 3cd Program Component 1 Coordinator