SUSTAINABLE DISASTER RISK MITIGATION THROUGH RETROFITTING and MASS AWARENESS

PROJECT IN ECO MEMBER COUNTRIES

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OUTLINE

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ABOUT UN-HABITAT TEHRAN DISASTER MITIGATION OFFICE
The United Nations Human Settlements Programme (UN-HABITAT) Disaster Mitigation Office was established in April 2007 with an Agreement between the Islamic Republic of Iran and UN-HABITAT focusing on:

- Rehabilitation of urban settlements in the Region, particularly Iran and improvement of the preparedness measurements for potential disasters and earthquakes
- Capacity-Building support in the area of earthquake resistant housing,
- Link to disaster mitigation with sustainable relief and reconstruction
- Dissemination of earthquake resistant technologies within the region and supporting measures for better enforcement of building codes and urban development.
Mandate & Mission

The primary responsibilities of the office pursuant to the mandate of the UN-HABITAT related to the sustainable human settlements development are:

- Strengthen the co-operation of the Islamic Republic of Iran and other United Nations Member States with the UN-HABITAT and other UN agencies, programmes and funds in the field of earthquake resistant construction.

- Promote participation of the experts, scientists and urban managers in UN-HABITAT activities and more specifically in the field of earthquake resistant construction.

- Increase the possibilities for the interested Member States to provide development recourses and contribute towards capacity enhancement in earthquake resistant construction through technical and financial means.

- And to promote UN-HABITAT mandated activities in the Islamic Republic of Iran.
ACTIVITIES & COMPONENTS

In the framework of the objectives, Office has initiated a 5 year period work plan by defining the working scheme into 4 main Components:

Component A: Seismic Risk Mitigation for Public Facilities and Housing
Component B: Dissemination of knowledge for Sustainable Urban Development
Component C: Enforcement of Building Codes
Component D: Project Management and Model Cities
ABOUT ECO SECRETARIAT
THE ECO SECRETARIAT

- Economic Cooperation Organization (ECO) is an intergovernmental regional organization established in 1985 by Iran, Pakistan and Turkey for the purpose of promoting economic, technical and cultural cooperation among the Member States.

- ECO is the successor organization of Regional Cooperation for Development (RCD) which remained in existence since 1964 up to 1979.

- In 1992, the Organization was expanded to include seven new members: Islamic Republic of Afghanistan, Republic of Azerbaijan, Republic of Kazakhstan, Kyrgyz Republic, Republic of Tajikistan, Turkmenistan and Republic of Uzbekistan.
THE ECO SECRETARIAT

MANDATE & MISSION

The primary objective of ECO secretariat is:

- Sustainable economic development of Member States;
- Development of transport & communications infrastructure linking the Member States with each other and with the outside world;
- Economic liberalization and privatization;
- Effective utilization of the agricultural and industrial potentials of ECO region;
- Progressive removal of trade barriers and promotion of intra-regional trade;
- Greater role of ECO region in the growth of world trade; Gradual integration of the economies of the Member States with the world economy;
- Regional cooperation for drug abuse control, ecological and environmental protection and strengthening of historical and cultural ties among the peoples of the ECO region;
- Mutually beneficial cooperation with regional and international organizations.
PROJECT DESCRIPTION:

• The Objective:

• Mutual agreement for cooperation between UN-HABITAT and ECO secretariat…

• Development of seismic risk mitigation projects toward disaster preparedness and enhancement of response capacity, post-disaster recovery and disaster risk reduction associated with natural hazards in ECO member Countries…

• Republic of Turkey, Islamic Republic of Pakistan, Islamic Republic of Afghanistan, Republic of Azerbaijan, Republic of Kazakhstan, Kyrgyz Republic, Republic of Tajikistan, Turkmenistan and Republic of Uzbekistan.
Earthquake Hazard of the Region
Iran is Also Obviously an Earthquake Country

- Alborz EQs
- South of Zagross EQs
- EQs Around Lut
- Lut block
- Makran Fault (M>8)
The 2000 year old Citadel in Bam (Iran), the world's largest mud fortress before the earthquake in 2003.

Bam after earthquake December 26, 2003

Photo: Marty Bahamonde/FEMA
DEVELOPMENT OBJECTIVE & INDICATORS:

Key indicators:

1. List of existing public facilities (school, hospital, administrative buildings),

2. Initial vulnerability studies and prioritization list of essential public facilities,

3. Disaster Management system and Disaster Reduction Policies
DEVELOPMENT OBJECTIVE & INDICATORS:

3. Construction types, building codes, rehabilitation processes and hazard profile of individual countries,

4. Assessment and retrofitting designs for three most resemble school, hospital and administrative buildings in each country using cost effective methods,
DEVELOPMENT OBJECTIVE & INDICATORS:

6. Cost benefit analysis and probable budget need for rehabilitation and multi-hazard risk mitigation in the countries.

7. Skills and technical capacities of the relevant emergency response units;

8. Enforcement of building codes and mass awareness campaigns.
IMPLEMENTATION

Institutional and implementation arrangements

✓ Project implementation will be placed under the responsibility of the UN-Habitat and ECO Secretary General Based in Tehran.

✓ A small Coordination Unit (CU) will be established under this Office, headed by two experts from UN-Habitat and ECO secretariat.

✓ Each relevant agency from the member countries (such as Provincial Directorates of Health, Education, Public Works, etc.) will nominate a senior staff to be a liaison between the CU and their mother agency.

✓ The CU will be responsible for project coordination, financial management, monitoring, and evaluation and reporting.

✓ A Project Steering Committee will be established to oversee project implementation and provide strategic guidance.
PROJECT COMPONENTS AND DETAILS

The objective is defined in three components:

Component A: List of Public Facilities and Prioritization List

Component B: Feasibility Studies and Retrofitting Designs

Component C: Support for enhancement of Response Capacity and Disaster Management Systems and training through mass awareness campaigns in the region
Component A: List of Public Facilities and Prioritization List

- List of existing public facilities from relevant ministries (schools, hospitals, administrative buildings, social service buildings, dormitories...etc) for the most vulnerable cities

- Initial vulnerability assessment studies for the list of the buildings and prioritization list
PROJECT COMPONENTS AND DETAILS

Criteria for Prioritization

- Accessibility during disasters
- Technical Features of Building
  - Construction Year
  - Type of the building
  - Number of story
- Distance to Epicenter
- Distance to Fault Line
- Importance in Disaster Management Plan (Strategical Location)
- Number of People getting served
- Working Hours
- Population Served
Component B: Feasibility Studies and Retrofitting Designs

- Determination of construction types, building codes, rehabilitation processes and hazard profile of countries and define ad’s, con’s by developing a detail report including possible rehabilitation and retrofitting methods and post disaster damage repair alternatives,

- Conducting feasibility studies and preparing retrofitting designs using the most cost effective method for the three of the most resemble essential buildings (1 school, 1 hospital and 1 administrative buildings) in each country

- Preparing cost benefit analysis and probable budget for rehabilitation and multi-hazard risk mitigation of the selected vulnerable buildings in the Prioritization List and estimate the possible return period.
SELECTION OF BUILDINGS

The types of public facilities:

Medical Facilities
- Hospitals (One Hospital from each member countries, a total of 10 buildings)

Educational Facilities
- Schools (One School from each member countries, a total of 10 buildings)

Administrative Facilities
- Facilities essential for the administrative functioning of communities at risk after disaster, including communication and coordination centers (One Admin building from each member countries, a total of 10 buildings)
PROJECT COMPONENTS AND DETAILS

Feasibility Studies and Assessment Process

1. Determine seismic deficiencies
2. Establish rehabilitation objective
3. Obtain as-built information
4. Select rehabilitation method
5. Identify rehabilitation schemes
6. Design the rehabilitation / verify design
PROJECT COMPONENTS AND DETAILS

Vulnerability Assessment…

1. Data Collection and Investigations
   - Collection and Review of All Existing Documents and Data
   - In-situ and Laboratory Material Testing
   - Geotechnical Investigations

2. Survey (Construction) Project
   - Geometrical and Architectural Surveys
   - Structural Survey

3. Seismic Performance Assessment
   - Site Specific Hazard Assessment
   - Seismic Performance Assessment of Structures

4. Seismic Retrofit, Strengthening and Renovation Projects
   - Preliminary Retrofit and Renovation Projects
   - Detailed (Final) Retrofit and Renovation Projects
Rehabilitation Objective

\[ \text{Rehabilitation Objective} = \text{Performance Level} + \text{Earthquake Hazard Level} \]

(Graphics Courtesy of ATC)
Rehabilitation Objective

Strengthening by using Conventional Methods..
Rehabilitation Objective
Strengthening by using Innovative Methods..

- Cost effective Analysis...
PROJECT COMPONENTS AND DETAILS

Cost benefit analysis

✓ The cost benefit threshold for eligibility for project financing will be determined through the feasibility studies being carried out,
✓ approximately 30 to 40% of replacement cost,
✓ Depend on function, age and sector operational requirements
✓ The retrofitting designs will only be conducted for the buildings that are
  ✓ Technically feasible,
  ✓ Socially acceptable
  ✓ Financially affordable
Component C: Support for enhancement of Response Capacity and Disaster Management Systems

- Review the existing Disaster Management System of the country and provide/propose possible international model for the enhancement of response capacity for an expected disaster, particularly
- Define skills and technical capacities of the relevant emergency response units;
- Define possible improvement plans in compliance with building codes.
- Prepare Training campaigns and disseminate technical expertise for mass awareness
The basic tenets of Disaster Risk Management are:

- Understand/Quantify the Existing Hazard and Risk
  - Seismological Observations
  - Earthquake Hazard
  - Earthquake Risk
- Do not Increase the Existing Risk
- Decrease the Existing Risk
- Transfer the Risk
- Improve Emergency Management.
The basic tenets of Disaster Risk Management are:

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The basic tenets of Disaster Risk Management are:

- Understand/Quantify the Existing Hazard and Risk
- Do not Increase the Existing Risk (i.e. build properly);
- Decrease the Existing Risk
- Earthquake Retrofit of Structures
- Earthquake Retrofit of Cultural Property
- Earthquake Early Warning System
- Earthquake Rapid Response System
- Structural Health Monitoring
- Transfer the Risk
- Improve Emergency Management.
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Compulsory Earthquake Insurance

*Increase insurance penetration*

*Reduce government catastrophe risk exposures*

- Improve Emergency Management.
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Core system implementation
Integrated risk management
Public awareness and education
Community-level approaches
MASS AWARENESS CAMPAIGNS&TRAINING MATERIALS...

Activities to develop training programs and materials for different target groups and materials for public awareness campaign will be under two components:

Part A: Community Disaster Awareness: Training programs and materials under several headings will be developed under this part. Implementation strategies for every training module and information campaign to increase the level of public awareness will also be developed.

Part B: Building Code Enforcement: Training programs and materials will be developed for three different target groups (decision makers, technical staff and community) regarding the importance of proper land use planning and construction.
RESULTS...

Monitoring and evaluation of outcomes/results

✓ Evaluation of the results through monitoring will be seriously considered, for drawing lessons for future applications.

✓ All the results, analysis and data gathered through implementation of the project will monitored periodically, analyzed and further recorded detail for possible establishment of a “Centre of Excellence” so that all the member countries can benefit from the outcomes, best practices and lessons learnt.

✓ In the case of the seismic risk reduction and enhancement of emergency preparedness the key activities and practices conducted in Iran, Turkey and Pakistan will further be compared and evaluated therefore, these valuable information can be to some extent used by other member countries.
RESULTS...
Outcomes:

- A key report for the institutions enabling decisions regarding investments in retro-fitting and rehabilitation of essential assets.
- Technical guidelines on possible local construction methods and post disaster damage rehabilitation.
- Possible Training and Mass awareness campaigns.
- Serve as basis for the contribution of international donors in providing loans for possible seismic risk mitigation projects in these countries.
- Assess the potential for demonstrating innovative technologies to reduce disruption and maximize economies.
THANKS FOR YOUR ATTENTION

CONTACT DETAILS

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