

2. Terms of Reference of the Proposed Study

(1) Necessity / Justification of the Study

The south and south-eastern parts of Kazakhstan is located along the North Tian-Shan and is one of the most active seismic zones in the Central Asian seismic region. The active faults in this zone have caused numerous strong earthquakes in the past. For the last 150 years there were four earthquakes with magnitude more than 7, two of them had the magnitude more than 8. These event were the 1889 Chilik earthquake (M=8.3) and the 1911 Kemin earthquake (M=8.2). Recent earthquakes occurred in the CIS countries showed that the fatality rate in Leninakan by the 1988 Spitak, Armenia earthquake was 5%, but in the northern Sakhalin city of Neftegorsk during the 1995 Sakhalin earthquake it was 60%.

Based on those experiences, it is estimated that more than one-half of all residential buildings would likely collapse or be damaged beyond repair if exposed to a MSK scale IX level of shaking, and a fatality rate would likely reach to at least 5% of the exposed population and an injury rate to 20%. For the city of Almaty, this would mean approximately 75,000 deaths and 300,000 injuries. Tremendous damages to the housing, essential infrastructure and life-saving facilities, along with enormous social and economic losses would be expected. Furthermore, as Almaty is a financial, business and cultural centre of the country, terrible toll will be inflicted as divert attention and resources needed for the greatest challenges of the country, i.e. economic development through transforming to the market economy, and social and environmental improvement.

In view of this, the Government of Kazakhstan requests the Government of Japan to assist the earthquake disaster risk mitigation of Kazakhstan through the Technical Assistance Programme of Japan International Cooperation Agency (JICA).

(2) Necessity / Justification of the Japanese Technical Cooperation

Japan has experienced serious earthquake damages in the past. The recent Kobe Earthquake (The Hyogo-Ken Nanbu Earthquake) of 1995 killed more than 6,400 people, injured more than 43,000 people, and affected more than 480,000 people, and caused economic losses of more than 10 trillion Japanese Yen or 100 billion US\$ and a long term economic recession of the region.

Enormous efforts have been accumulated and are currently carrying out to reduce and mitigate impacts from future earthquakes such as the gigantic offshore Tonankai and Nankai Earthquakes. Numerous studies have been carried out and various technologies have been developed for the purposes in the stages of emergency response and relief, rehabilitation and reconstruction, and mitigation and preparedness. Importance of community involvement for earthquake disaster risk mitigation has been stressed strongly in Japan.

Transfer of these experiences, lessons, know-how and technologies of Japan through the Technical Cooperation Scheme will be indispensable to reduce the impacts of

earthquakes to Kazakhstan as well as Central Asia and the Caucasus countries.

(3) Objectives of the Study

The main objectives of the Project are:

- (i) To assess earthquake disaster risk of Almaty,
- (ii) To prepare recommendations to mitigate earthquake disaster risk of Almaty as well as Kazakhstan,
- (iii) To prepare programs to enhance capacity of Kazakhstan to implement the recommendations,
- (iv) To promote the regional cooperation for earthquake disaster risk mitigation, and
- (v) To pursue technology transfer to the counterpart personnel as well as to disseminate findings to public, administrator and experts of Kazakhstan and the region.

(4) Area to be covered by the Study

Almaty (Location map and study area are shown in Figures 1 and 2, respectively)

(5) Scope of the Study

The Study will cover the following tasks.

- (i) Planning of the Study,
- (ii) Collection and analysis of existing data, information and studies,
- (iii) Field reconnaissance,
- (iv) Field survey,
- (v) Preparation of digital topographic maps,
- (vi) Preparation of GIS database and maps,
- (vii) Assessment of capacities of Kazakhstan for earthquake disaster risk management,
- (viii) Assessment of earthquake disaster risk of Almaty,
- (ix) Preparation earthquake impact scenarios for Almaty,
- (x) Preparation of recommendations for earthquake disaster risk reduction for Almaty as well as for Kazakhstan,
- (xi) Preparation of programmes to enhance capacity of Kazakhstan to implement the recommendations,
- (xii) Preparation of recommendations and programmes for regional cooperation for earthquake disaster risk reduction,
- (xiii) Workshops and seminars, and
- (xiv) Comprehensive study reports.

(6) Study Schedule

The Study is scheduled to begin in September 2006 and is expected to last for 26 months.

(7) Expected Major Outputs of the Study

Expected major outputs from the Study are:

- (i) Digital topographic maps, and GIS database and maps of Almaty prepared,
- (ii) Earthquake disaster risk of Almaty assessed,
- (iii) Capacity of earthquake disaster risk management of Kazakhstan assessed,
- (iv) Recommendations for earthquake disaster risk mitigation identified,
- (v) Programs for enhancement of capacity of Kazakhstan to implement the recommendations prepared,
- (vi) Recommendations and programmes for regional cooperation for earthquake disaster risk reduction prepared, and
- (vii) Workshops and seminar with experts of the region conducted.

(8) Request of the Study to Other Donor Agencies, if Any

None

(9) Other Relevant Information, if Any

Several countries and international organizations have started to show interest to the Republic of Kazakhstan in relation to its high risk of earthquake and other natural disasters: emergency response training centre and training support from Germany, material and training support from NATO, material, training, and exchange of official delegations through cooperation agreements with the Federal Emergency Management Agency (FEMA) of the United State, and from Japan training scholarships, funding for participation in the international earthquake conferences in Kobe and the technical assistance to improve the seismological monitoring system.

The regional cooperation has started among the CIS countries for the reduction of natural disaster effects and provision of assistance in case of emergencies. These include "Agreement on Cooperation and Interaction in the Field of Study of Earthquakes and Forecasting of Seismic Danger of the Countries of the CIS (Moscow, 1993)", "Agreement between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic and the Republic of Uzbekistan on cooperation and interaction in the Field of Research on Earthquakes and Forecasting of Seismic Danger (Bishkek, 1995), and "Agreement between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tadjikistan and the Republic of Uzbekistan on Cooperation in the field of Prevention and Liquidation of Emergencies (Cholpon-Ata, 1998)

3. Facilities and Information for the Project/Study

(1) Requested JICA experts for the Project/Study

A list of requested core JICA experts is shown in Table 1.

Table 1 List of Requested JICA Experts

Designation	Number	Time involved (months)
Team Leader/ Disaster Management Planner	1	10
Institution and Organization Specialist	1	8
Community Based Disaster Management Specialist/Regional Cooperation	1	8
Emergency Preparedness Specialist	1	4
Seismic Engineer (Microzoning Specialist)	1	8
Geotechnical Engineer	1	8
Urban Development Planner	1	8
Seismic Engineer (Architect 1)	1	10
Seismic Engineer (Architect 2)	1	6
Seismic Engineer (Civil Engineer)	1	8
Cartographer	1	8
Geographic Information System (GIS) Specialist	1	8
Total	12	94

(2) Assignment of the Counterpart Personnel of the Implementing Agency for the Project/Study

Almaty City Administration shall be responsible for identifying and assigning counterpart officers from within the City Administration or from other relevant organizations as necessary. Other staff support shall be drawn from units within the City Administration performing related functions required by the Study.

(3) Available Data, Information, Documents, Maps etc. Related to the Project/Study

Information and data that may be needed in conducting the Study are readily available from Almaty City Administration and other related ministries and organizations. These include information and data on, topography, geology, earthquakes, natural conditions and environment, demography and social conditions, buildings and infrastructure, laws and regulations, and institutions.

(4) Information on the Security Conditions in the Study Area

GOOD

4. Global Issues (Environment, Gender, Poverty, etc.)

- (1) Environment Components (Such as Pollution Control, Water Supply, Sewage, Environment Management, Forestry, Bio-diversity) of the Project, if any:

Disaster Risk Mitigation of urban vulnerability of the population, especially the poor, and of the social and economic environment is an integral part of country's Environmental Management and Poverty Alleviation strategies.

- (2) Anticipated Environmental Impacts (both Natural and Social) by the Project/Study, if any:

Pronounced positive impacts will be expected. The disaster risk mitigation measures that will be formulated are consistent with the improvement of Kazakhstan's urban environment, such as fast deteriorating building stock and infrastructure, overcrowding in dwellings, and elimination of vegetation during urbanization process.

- (3) Whether or not women are main beneficiaries of the Project/Study:

Yes. In Kazakhstan collapse of housing by an earthquake will be the major cause of death, injuries, and sufferings. Women staying indoors and engaging in household activities are among the worst affected. The well-planned disaster risk mitigation measures, especially those of community based, will give the most benefit to women.

- (4) Project Components which Requires Special Considerations for Women (such as Gender Difference, Woman Specific Role, and Women's Participation), if any:

One of the main components of the Study will be the community and family based disaster risk mitigation. Women's participation can play vital role in this approach, by such as active participation in planning and implementation of mitigation measures, taking lead roles in awareness raising and advocacy, and care for children and the elderly during the earthquake disaster.

- (5) Anticipated Impacts on Women Caused by the Project/Study, if any:

The community and family based disaster risk mitigation programs will have direct impact on reducing risks to women, their family and the community during the earthquake disaster.

- (6) Poverty Alleviation Components of the Project/Study, if any:

The other important component of the Study will focus on improvement housing stocks to earthquake damages. This component has a direct impact on Poverty Alleviation, since low-income people tend to live in the lack of maintenance and aged buildings in the overcrowding urban area, and they are considered highly vulnerable to the earthquake disaster.

- (7) Any Constraints against the Low-income People Caused by the Project/Study:

Not applicable

5. Undertakings of the Government of Republic of Kazakhstan

In order to facilitate the smooth and efficient conduct of the Study, the Government of Republic of Kazakhstan shall take necessary measures:

- (1) to secure the safety of the Study Team, provided by laws of the Republic of Kazakhstan.
- (2) to permit the members of the Study Team to enter, leave and sojourn in Kazakhstan in connection with their assignment therein, and exempt them from foreign registration requirements and consular fees, in the presence of the respective agreement with the Government of Japan.
- (3) to exempt the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Kazakhstan for the conduct of the Study, in the presence of the respective agreement with the Government of Japan.
- (4) to exempt the Study Team from income taxes, duties and any charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Study Team for their services in connection with the implementation of the Study, in the presence of the respective agreement with the Government of Japan.
- (5) to provide necessary facilities, stipulated by laws of the Republic of Kazakhstan to the Study Team for remittance as well as utilization of the funds introduced in Kazakhstan from Japan in connection with the implementation of the Study,
- (6) to secure permission for entry into private properties or restricted areas for the conduct of the Study, in the absence of restrictions, stipulated by the legislation of the Republic of Kazakhstan.
- (7) to secure permission for the Study Team to take all data, documents and necessary

materials related to the Study out of Kazakhstan to Japan, and which are not objects of restricted transference.

- (8) to provide medical services, stipulated by laws of the Republic of Kazakhstan. Said expenses will be chargeable to members of the Study Team.

6. Undertakings of the Government of Republic of Kazakhstan

- (1) The Government of Kazakhstan shall take measures for settling claims, if any arise against member(s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Study Team.
- (2) Almaty City Administration shall act as counterpart agency to the Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The Government of Republic of Kazakhstan assures that the matters referred to in this form will be ensured for the smooth conduct of the Development Study by the Japanese Study Team.

Signed : _____
Mr. _____

Titled : Mayor of Almaty

On behalf of the Government of
Republic of Kazakhstan

Date : _____, 2005

