The system of quick estimation of damages will cover the 7 million inhabitants of Bogotá, tanks to the improvement in efficiency and response of the related entities that will attend the emergency after the earthquake, according to the Response Plan delivered by the Mayoralty of Bogotá.

(5) Scope of the Study:
Enter in a concise manner using an itemized statement.

Phase I. To check the different detailed studies executed in each zone with instumentation by landslide, such as (an example) the studies exectuted along the river basin of Tunjuelito for the measure of water level and the result of hidro-meteorologic network. This checking process involves field visits in order to check specific situations. Existing data must be reviewed in order to construct and fit the database of the diferent processes. This evaluation includes the actual cadastral database. It's necessary that when this phase is finished, the execution of the trainee programme in Japan, with the objective of seeing projects o programmes already developmentd in Japan, which could be used in the city.

Phase II. To design the Instrumentation System for Landslides, for the Tunjuelo river basin and to complete the hidro-meteorological system, telemetric system of accelerographic network (30 strong motion stations), and the support software for data and information analysis. to estimate the damages after an earthquake. It is not necessary for the Team to visit the critical zones.

Phase III: Develop a field work to implement the systems designed, the installation of equipment and monitoring elements, as well as the information managed system. The basic work should be guided by the Japanese Experts with the direct support of Colombian Companies that will execute the installation. In this Phase it is not necessary that the whole group of experts work.

Phase IV. The different systems and instruments shall begin to operate, checking their information quality, as well as the response of them in front of changes. Even though the estimated time is short, this time will allow the required space to perform the technological transfer to the Colombian personnel, in order to continue with an autonomous process. In this final phase, the field work of the Japanese Team is minimum.

(6) Study Schedule:
- Enter the time/period of the study:

Term of the Project: One year and eight months (20 months) distributed as follows:

Phase I. Study and evaluation. Term: 3 months.
1 Study and evaluation of the existing monitoring system in the complex landslides in Bogotá.
2 Study and evaluation of the hydro-meteorological network and the early warning system.
3 Study and evaluation of the present seismic netwotk of the city Study and evaluation of the viability to implement the telemetric system in the actual network.
4 Evaluation and adjust of the landslides and floods database, and the system for quick estimation of damages after an earthquake.

Phase II: Design. Term: 5 months.
5 Design of the monitoring system for landslides in the city.
6 Design of the monitoring system in the Tunjuelo river basin.
7 Design of the telemetric system for the Accelerographic network.
8 Design of the software to analyse the database (includes information about seismic acelerometers, Cadastral Data and other necessary information) to do a quick estimation of damages after an earthquake.

Phase III. Implementing. Term: 8 months.
9 Implementation of the monitoring system for landslides in the city.
10 Implementation of the telemetric system for the Seismic network.
11 Implementation of the software for the estimation of damages in real time.

Phase IV. Operation. Term: 4 months.
12 Start the operation of the designed system.

(7) Expected Outputs of the study:

The design of new alternatives and the implementation of monitoring–warning systems for landslides, floods. Creation of the quick estimation system of damages after an earthquake, in order to start and complement the Disaster Management Information System.

(8) Posibility to be implemented / Source of resources waited:

At the present time there are not available sources destined for the direct implementation of the project, and that is one of the reasons why the City needs the assistance of the japanesse gavernement.

The city, through the FOPAE would provide the support for the experts, with a budget allocation close to $120 millions pesos (US$45,396, -money change rate of $2,643 pesos per dollar-). In the same way, for the next year the FOPAE has planned to invest in the maintenance of hidro-meteorological network and to continue with the projects of landslides monitoring. For a vehicle to the transport of the study team, the FOPAE can invest about $30 millions pesos (US$11,349). There will be available an office for the experts in one building that belongs to an official entity, which will be located in a strategic area in the city regarding the mobilisation.

(9) Request of the study to other donor agencies, if any:

No other request has been done to other agencies.

(10) Other relevant information
Enter relevant information other than that decribed above, if any.

3. RESOURCES AND INFORMATION FOR THE STUDY:

(1) Counterpart personnel of the entity in charge of the implementation.

Japanese Side:

a) Human resources:

1 One expert in geotechnical engineering with specific knowledge in landslides and monitoring instruments.
2 One expert in hydraulic engineering with experience in floods and monitoring instruments.
3 One expert in geotechnical and hydraulic monitoring instrument with specific knowledge in design and installation of equipment.
4 One expert in seismic hazards and monitoring instruments (telemetric).
5 One expert in seismic monitoring with experience in design and installation of equipment.
6 One expert in software and program design.
7 One expert in database management – SIG.

Expert Japanese's schedule:

Stage I.
3 months: experts 1, 2, 4 y 7.
1,5 moths: experts 3, 5 y 6.
Stage II:
5 months: experts 3,4, 6 y 7.
2,5 months: experts 1,2 y 5.
Stage III
8 months: Experts 3,4, 6 y 7.
3 months: Experts 1,2 y 5.
Stage IV
4 months: Experts 3,5,6 y 7.
2 months: Experts 1,2 y 4.

It is desirable that the Japanese experts have experience in geotechnical and hydraulic monitoring systems, and experience in designing similar systems in Japanese cities. This group of Japanese engineers requires the support of Colombian experts in order to count with local experience. and so to obtain the best designs for the implementation of them in the stage III of the schedule described.

There exists the possibility that the instrumentation project would be implemented only in some areas, but it is necessary that particular recommendations will be given to the Colombian counterpart, in order to continue with such project in other term of time and to extent the project to other areas of the city. It is necessary be careful with the time of the stage III because it depends of the outcomes of the stages I and II.

It is important to foreseen the time required to import the equipment from Japan. In the activities of installation process is necessary the Colombian participation in order to strengthen the technical knowledge of local engineers.

b) Logistic resources

- Equipment and monitoring systems for landslides such as: extensometer, inclinometer, electronic piezometer, pressure gauge, transmission data system, and reception and analyses software for early warnings according to the established design.
- Instruments and real time water level measurement systems for rivers, as well as other relevant equipment for floods analyses.
- Transmission data system for the accelerometer network (30 – Etna – Kinemetrics instruments), such as: GPS's, antennas, solar cells, modem (for accelerometers), reception, recording and analyses software, as well as software for damages calculation to generate the disaster scenarios.

c) Support Resources
- Two scholarships for Colombian experts, in order to be trained about monitoring and manage of complex phenomenon.

Colombian Side:

a) Human resources:
- Project coordinator with experience in disaster prevention.
- One expert in geotechnical engineering with knowledge in landslides and monitoring.
- One expert in hydraulic with experience in floods and knowledge in monitoring.
- One expert in seismic hazards.
- One expert in software design – programmer.
- One expert in database – SIG.

b) Logistic resources:

- Vehicles to transport Japanese experts in the city.
- An office for the experts job.

(1) Available data, information, documents, maps, etc. Related to the Study.

- The Study on Disaster Prevention in The Bogotá Metropolitan Area in The Republic of Colombia – Interim Report.

(2) Security Conditions in the Study Area:

Within Bogotá city it is regarded that security and mobilisation conditions are safe. The field visits will be limited to recognise excursions on Phase I and Phase III; other data will be collected from maps, photographs and magnetic information.

4. GLOBAL ISSUES (Environment, Gender, Poverty, etc)

(1) Environmental parameters (such as pollution control, water supply, sewage, environmental management, forestry, biodiversity) of the Project, if any.

Does not apply.

(2) Anticipated environmental impacts (both natural and social) by the Project, if any.

Does not apply.

(3) Women as main beneficiaries or not

People in general will be beneficiaries, but not women specifically.

(4) Project components which require special consideration for women (such as gender difference, women specific role, women's participation), if any.

Does not apply.

(5) Anticipated impacts on women caused by the Project, if any

Does not apply.

(6) Poverty alleviation components of the Project, if any.

Does not apply.

(7) Any constrains against the low-income people caused by de project.

No one.

5. REQUIREMENTS TO BE UNDERTAKEN BY THE GOVERNMENT OF COLOMBIA:

In order to facilitate the smooth and effective conduct of the Study, the Government of Colombia shall take necessary measures:

(1) To secure the safety of the Study Team,

(2) To permit the members of the Study Team to enter, leave and sojourn in Colombia in connection with their assignment therein, and exempt them from foreign registration requirements and consular fees,
(3) To exempt the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Colombia for the conduct of the Study,
(4) To exempt the Study Team from income tax and charges of any kind imposed on or in connection with the implementation of the Study,
(5) To provide necessary facilities to the Study Team for remittance as well as utilisation of the funds introduced in Colombia 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,
(7) To secure permission for the Study Team to take all data, documents and necessary material related to the Study our of Colombia to Japan, and,
(8) To provide medical services as needed. Its expenses will be chargeable to members of the Study Team.

6. CLAIMS

The government of Colombia shall bear 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 wilful misconduct on the part of the member of the Study Team.

7. COUNTERPART

The FOPAE shall act as counterpart agency to the Japanese Study Team and also as co-ordinating body in relation with other governmental and non-governmental organisations concerned for the implementation of the Study.

8. RESPONSIBILITIES OF THE PRODUCTS

The FOPAE will, as the executing agency of the project, take responsibilities that may arise from the products of the Study.

Signed: _____

Title: _____

On behalf of the Government of Colombia

Date: _____