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ADVISORY MISSION ON PROTECTION AND
SAFETY MEASURES IN BUILDINGS
DAMAGED BY EARTHQUAKES
AND OTHER DISASTERS

SI/MEX/86/801/11-52

MEXICO

Terminal report

Prepared for the Government of Mexico
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of a team of three consultants from the
Danish Civil Defence and Emergency Planning Agency

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disaster relief*

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ABSTRACT

The project "Advisory mission on protection and safety measures in buildings damaged by earthquakes and other disasters" (SI/MEX/86/801), for which the United Nations Industrial Development Organization (UNIDO) is the executing agency on behalf of the United Nations Development Programme (UNDP), was carried out by a team of three consultants from the Danish civil defence organization, Civilforsvarsstyrelsen, from 2 to 10 April 1986.

The objective was to advise the Government of Mexico on ways and means of strengthening their disaster relief capacity, particularly with respect to safety measures in industrial buildings. The project also foresaw a study tour at a later stage for three specialists from Mexico to Denmark to see the Danish civil defence organization in operation.

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INTRODUCTION

A team of three consultants from the Danish civil defence organization, Civilforsvarsstyrelsen (the Danish Civil Defence and Emergency Planning Agency), Copenhagen, visited Mexico City from 2 to 10 April 1986 under the project "Advisory mission on protection and safety measures in buildings damaged by earthquakes and other disasters" (SI/MEX/86/801) for which the United Nations Industrial Development Organization (UNIDO) is the executing agency on behalf of the United Nations Development Programme (UNDP), to assess the capacity of protection and rescue operations in Mexico.

En route from the airport to the city, damage resulting from the severe earthquake which struck Mexico at 7 a.m. on 20 September 1985 was evident, although many damaged buildings had been removed.

General Salvador M. Bravo y Magana, Director, Sistema de Proteccion y Restablecimiento del Distrito Federal (SIPROR), who only spoke Spanish, and Professor Ovsei Gelman, University of Mexico, an expert on civil defence matters, who also spoke English, arranged the programme for the mission, and it was agreed that although representatives of national authorities would not be present at the meetings, staff of the Ministry of the Interior, who were responsible for Mexico's planning and relief organizations, would be invited to attend.

Stress was placed on the support given by the Mexican people to one another in the distress which followed the earthquake on 20 September 1985, and the fact that it occurred at 7 a.m. helped explain the relatively small loss of life as government buildings, offices, schools etc. were next to deserted at the time.

A video presentation of a film made by a SIPROR staff member showed how rescue work was undertaken, and how ineffective many efforts were in the situation.

Freeing trapped persons was performed in a less than suitable manner, the fire brigade was engaged in putting out minor fires, and sequences showed police and military personnel engaged in purely guard duties.

Extensive use was made of powered excavators, but not where there were survivors in the buildings concerned, and it was interesting to note that although in some areas collapse of buildings was total, in other areas individual houses had collapsed whilst adjacent houses remained unharmed.

It was clear that the older part of the city, containing conventional brick houses, had suffered no damage, whilst the collapsed areas contained houses built with reinforced concrete. These had been constructed in the 1960s to 1970s, and it was noted on the film and verified later, that the floors had collapsed in such a way as to enable the concrete to come loose from the reinforcing steel, which was still intact. It was the opinion of the team that concrete quality was poor in these instances.

The film also showed a European group who had arrived to try and find people in the ruins with the help of rescue dogs, but in view of the gigantic task at hand, their efforts were to little avail.

The team was then told that the water supply was interrupted during the earthquake because the main water plant had been wrecked, and that the banking system had broken down because of power failures. Equipment used for cleaning

operations in the first few days was made available by contractors, and the owners of buildings had to organize rescue work themselves. Each ruined house had been allotted an engineer or architect who guided volunteers in the task of rescuing others in such a way as to minimize risk to their own lives.

Finally, at a meeting in the Royal Danish Embassy, an outline of the political situation in Mexico was given to the team by the Danish ambassador, P. B. Søndergaard.

RECOMMENDATIONS

With respect to the following recommendations the consultants would like to make the following reservations. Their report was made solely on the basis of the information obtained during a one-week visit to Mexico City. The consultants have no factual knowledge about the conditions characteristic of the individual states or communities, and the short duration of the visit was insufficient to enable them to investigate conditions further.

They wish also to stress that their knowledge of conditions in Mexico is extremely limited; this applies to the situation within the political system, the trade union movement, and other bodies which have a bearing on the matter. The recommendations should only be considered as final after thorough discussions with the competent authorities. The recommendations should also be understood as being made on the basis that the consultants did not ascertain the existence of a proper rescue service. They have since been informed that the Mexico City fire brigade performed a number of rescue operations, but it is their belief that with the equipment they saw, only limited tasks of this nature could be undertaken.

A. The command structure

1. A command structure should be established; it should be able to co-ordinate all resources in a disaster situation. The resources comprise:

- (a) Fire fighting;
- (b) Rescue service and first aid;
- (c) Transportation of casualties (ambulances);
- (d) Taking care of casualties (hospitals);
- (e) Care of the homeless (billeting and feeding);
- (f) Maintenance of law and order (the police).

A communications network should be made available to ensure that the command structure is effective.

2. The command structure should follow the local administrative units and should be set up as follows:

- (a) National level (e.g. under the Federal Ministry of the Interior);
- (b) State level, including the Federal district, Mexico City (e.g. under state Ministries of the Interior and the Federal District);
- (c) Community level (under the mayor).

As in Denmark, it is important that organizations designed to aid people after disasters are run by the civil authorities.

3. The personnel of the command structure should reflect normal conditions, but it must be possible to boost the staff when cases of large-scale accidents require prolonged operations. One way of doing this is to designate civil servants from related administrative units. Another is to designate people from commercial enterprises, i.e. from businesses not under the control of public authorities. However, everyone involved in the command structure must be trained and their training must be kept up to date.

B. The establishment of a rescue service

4. It is recommended that a rescue service proper be set up in conjunction with the existing fire brigades; the fire brigades should be provided with the equipment necessary to cope with everyday situations (the normal situation). This requires additional material than we saw with the existing fire brigades, which should be operated by trained fire fighters.

5. In cases of large-scale rescue operations, individual communities should be able to enlarge their rescue and other services. This can be achieved through the storing of equipment and the designation of personnel. For socio-economic reasons the services of the community should, however, not be aimed at being able to solve a "worst case" scenario. The rescue service should be able to support the fire brigades during major operations. The organization may take the form of self-protection units in residential or industrial areas. The service personnel may be volunteers from the area or the plant.

6. At the state level, mobile units should be available. These can be deployed in cases of large-scale damage. The units may be organized together with training facilities (see 9 below). Concrete evaluation will indicate whether the units are to be organized under the Federal government or under the individual state; but it must be stressed that minute co-ordination of all activities should be ensured, including uniform material and training schedules. This makes it easier to operate in a damaged area.

C. Personnel recruitment

7. Leadership personnel should, as far as possible, be employed by the authorities who solve the tasks on an everyday basis. With respect to large-scale accidents a reserve should be available, especially in cases demanding prolonged operations. The leaders will have to fulfil different requirements, depending on their level of activity. Training should cater for these different needs.

8. The work of many people is needed at the manual level. Everyday tasks must be solved by those employed by the different services, e.g. the fire brigades and the ambulance services. The recruitment of personnel for large-scale accidents and the ensuing rescue work is a crucial question. After the earthquake in 1985 in Mexico City, most of the rescue work was performed by volunteers; the authorities were not really involved in its organization. It is obvious that this spirit of self-sacrifice should be utilized in order to obtain personnel. Better conditions for solving the tasks involved should be provided, however, through the procurement of equipment and training.

9. There are many problems related to the use of volunteers. These include:

- The recruitment of sufficient persons.
- Are they able to spare the time necessary for training?
- Can they be part of the preparedness for long enough to make the efforts a worthwhile investment?

Nevertheless, it is recommended that volunteers are included in the structures which make co-ordinated rescue work possible.

10. If the volunteer principle is not applicable, it is recommended that the national conscription model be adopted. Guidance is possible to a much greater extent in this instance than would be the case of the volunteer system. If this approach were selected, personnel should be directly conscripted instead of placing the responsibility with the military. Finally, a third possibility exists - the Danish model - which combines the two principles.

D. Training and education

11. The setting up of a graded leaders' training course is also recommended. It is important, however, that leaders at a high level are acquainted not only with constructional features and their typical forms of collapse, but also with the actual running of a rescue operation. Material on leaders' training and education was distributed during the consultants' visit to Mexico City in April 1986.

12. A teaching system which caters for the leaders' education should be set up. This should be run by the Federal government, and following further discussions with the Danish Civil Defence Agency, the first leaders and teachers can be trained in Denmark. These leaders and teachers can then train their future colleagues in Mexico.

13. For the discharge of manual level functions, training should be established within the different services. On the basis of a concrete analysis it seems preferable to combine the training within the different services as this makes the flexible use of forces possible in different operations. Naturally, rescuers must be well acquainted with the means of rescue operations, first aid, propping, and the means of lifting; and they must also have to know something about fire fighting.

14. Training centres for manual workers should be established. These centres should also be equipped with exercise facilities and should be operated either by the Federal government or by state governments. In the latter case, the Federal government must set up a co-ordination body with the aim of co-ordinating training. It would be advantageous to attach mobile units to the training centres; they would then be available for reinforcing local forces in cases of large-scale accidents. The trainees may also be part of the preparedness programme proper.

E. Equipment

15. The highest level of leadership should be furnished with command centres. These should be equipped with the necessary communications equipment together with statistical information. This type of centre should be established at all three levels (Federal, state and community).

16. The equipment for the individual services should be procured and stored in depots. It is essential that the equipment is simple and portable; simple because it is to be used by people who do not usually do civil defence work, and portable because it must be possible to take the equipment to areas where vehicles often cannot go.

17. Guidelines are to be established which describe the necessary operations in a damaged area (tactical principles); manuals and textbooks should be procured. The Danish Civil Defence Agency could make the relevant literature available.

F. Further co-operation

18. These recommendations will be discussed with the Mexican representatives who intend visiting Denmark in October 1986. The Danish Civil Defence Agency will provide detailed advice in relation thereto.

I. CIVIL DEFENCE IN MEXICO

General Salvador M. Bravo y Magana and his staff explained the organizational structure applying to the civil defence of Mexico City. It was emphasized that it had been introduced only after the earthquake, although since 1974 there had been an official plan for the protection of the population. Prior to that time it had been the responsibility of the police and the armed forces.

In 1980, the city government established Sistema de Proteccion y Restablecimiento del Distrito Federal (SIPROR), i.e. the "system for the defence of the population in the event of accidents in Mexico City". The organization is responsible for preventative as well as remedial measures, and is now subordinate to the city corporation.

At the outset the agency had only a planning function; but it was later, as a result of the earthquake, granted executive powers. It was difficult, however, for the agency to keep pace with the needs, because of the great expansion of the population and the high rate of vulnerability in the city. Rainfall often caused floods and there were often problems with the water supply. Moreover, buildings in Mexico City - at least in the areas which were formerly lake beds - sank at the rate of a few millimetres each year. There was also a high rate of pollution; household refuse was sometimes simply dumped in the streets, and there was an annual average of 29,000 fires, many of which sparked off explosions.

There were large industrial areas in the centre of the city, including petrochemical works with their own refineries. Attempts are now being made to locate these industries elsewhere, outside the city limits, but it is proving to be a difficult process. Mexico City's international airport is also located in the centre of the city, which also poses safety problems.

SIPROR has at its head the President of Mexico; then comes the Lord Mayor and his top officials; below these is a co-ordination committee which includes such individuals as General Salvador M. Bravo y Magana and his staff. Under the co-ordination committee are two subcommittees, one for studies and planning, compilation of information and data, preparation of statistics, and plans for education and training. The other (the executive subcommittee) is responsible for co-ordination between the executive agencies, compilation of lists of equipment and other resources, including hostels where survivors may be accommodated, and the capacity of hospitals. Finally, the co-ordination committee has an administrative agency.

Each local council throughout Mexico has similar organizations, co-ordinated by the Ministry of the Interior, on a nationwide basis. Heading the agency in each municipality is the Mayor, under whom there is a subdelegation which enjoys a line of contact with SIPROR for professional advice and guidance. There is also another committee beneath the subdelegation which co-ordinates population protection measures, and under that committee are two additional subcommittees: one responsible for plans and the other for execution.

SIPROR has so far provided advisory functions in connection with the gas disaster at San Juan, in connection with the interruption of the water supply, and with flooding in Mexico City. The intention is that SIPROR is to have

more authority so that the organization can also take action when accidents occur. It was further emphasized that the legislation on which the work is based relates not only to preventative and remedial measures, but also to reconstruction programmes.

With the aid of a large map of Mexico City the consultants were shown how attempts had been made to gather experience after the earthquake. It was quite obvious that the disaster has affected a zone in the city centre, but the degree of impact on other areas seemed to be a function of the type of subsoil on which the city stood. The hardest-hit sectors were those where the buildings were located on the former lake bed.

Work has now begun on the collection of relevant information and on the establishment of a data-processing system, and it is emphasized how important it is that the data are credible and accurate. Data collection is based on information provided by the general public, contributions from other public offices, and by the contribution of information from hospitals, by organizations engaged in survival matters, and information from environmental authorities. This information will later be used in planning activities.

The work of the Ministry of the Interior is divided into three phases. The first phase began in October 1985 when a national committee was set up to begin the reconstruction of Mexico City after the earthquake. The committee will, however, be responsible for planning to counter any future disasters, and in this connection, the population at large is able to participate. With this as a background, studies will be made as a basis for an actual organization, whose intention it is to:

- Diagnose risks.
- Prepare a safety programme for the population.
- Consult with the parties involved.
- Co-ordinate among the various administrative levels.
- Maintain a nationwide civil defence system.

The national committee has a technical secretariat which co-ordinates activities towards achieving these ends. A number of subcommittees have been formed which are intended to handle research in civil defence matters, identify the most serious risk elements, involve the population in the work, present proposals for education and training and to deal with legal aspects, and to be responsible for planning and execution of work in connection with accidents. The most recent subcommittee was one which was to be responsible for integration at the various levels in the states and local councils. The national committee's constitution contains a government mandate to establish a population protection system. There is also a system known as the National Democratic Planning System, and work on civil defence matters goes on within this framework. It is believed that the first phase has now been completed, and the build-up of a system will now begin. This phase has been referred to as the Planning and Concept Formulation Phase.

The second phase includes the work of organization and planning. All public authorities and commercial authorities as well as "the social sector" have been invited to participate in this phase. The social sector includes

the population at large, encompassing the lowest-paid public servants and industrial workers. Organizations which are then created can co-operate on the same basis with other agencies working on these matters. The Ministry of the Interior will prepare a number of programmes and manuals which will provide general and detailed guidelines.

Nationwide summaries of resources, qualitative as well as quantitative are also required. The objective is to prevent disasters, to safeguard lives, and to ensure the continued existence of the Mexican way of life. The distinction here is between preventative and remedial measures. The former are divided among administrative and some material matters, and it is intended to introduce a number of standards which formalize the way in which things are to be done. The starting point is the geological aspect of the country, the structure of sanitary services, and "the social structures".

With respect to remedial measures, these include alarm systems, evacuation, planning, co-ordination of actions, safety, rescue, material matters, sanitary matters, logistical matters, and "social communication". The Ministry of the Interior intends to streamline these areas, so that all parties involved react suitably in a given situation.

Finally, the Ministry of the Interior wants to establish a number of support functions for planning, co-ordination etc., including the construction of proper installations for civil defence.

A General Planning Act authorizes the President to co-ordinate among the various levels of society in Mexico. This includes the Federal state itself, the governments of the individual states, and the local councils. The President was granted these powers in order to ensure uniform development in the country.

The Ministry of the Interior, therefore, feels able to take the necessary initiative to ensure that agreements are made between the individual states and the local councils on the development programmes to be introduced. It also wishes to suggest agreements between private persons and those working in the private sector, and in this way it is hoped to set up groups of volunteers to handle some of the tasks. In the municipalities, the local councils will to a great extent seek to base their solutions on voluntary efforts. The commitment evidenced in connection with the earthquake gives reason to believe this endeavour will be successful.

Attempts are being made to review and introduce new legislation on civil defence. It is intended to construct study centres which will conduct scientific studies and thus provide the best possible foundation for the establishment and development of the civil defence system. These centres will also make an effort to involve private undertakings, universities etc.

The establishment of a fund is now being investigated for financing the project. The money will come from the Government, from industry, and from private individuals. The possibility of utilizing the insurance system for funding purposes will also be investigated: at present it is not customary, for example, to insure houses or motor vehicles.

The Ministry will also study the prospects of setting up a civil defence school designed to educate and train volunteers as well as professionals. There are also plans to organize volunteers on a geographical basis in the

states, municipalities, and even in the small villages. Efforts will also be made to organize according to a professional criterion, e.g. physicians and nurses; and organize according to places of work, hospitals, the police, and within industrial enterprises. Efforts will also be made to set up a rescue service.

The Ministry of the Interior anticipates a number of results by the end of 1986. These would include changes in the public structure; standardization within the various sectors; and arrangements between the various components for co-operation, preparation of action plans, and summaries of the resources available.

The third phase is operational, and is anticipated as beginning in January 1987. The programmes which have already been planned will then be implemented.

Work has meanwhile been in progress on a temporary programme facilitating a co-ordinated effort in the event that major disasters such as an earthquake should occur again. This is the prime target for the work of the Ministry of the Interior in its efforts to fulfil the expectations of the population with respect to disaster control.

II. ACCIDENT PROCEDURES

The procedures employed in Mexico City in the event of accidents are guided by the collection of data, which forms the basis for the execution of any programmes intended to be employed and, in particular, as a basis for decisions by the authorities. Data from previous accidents are now stored in a computer, so that it is now possible in any given situation to present politicians with various alternative responses. The possibilities of co-ordinating various measures will be effected through a committee, which has a number of support functions for the decision process. It is proposed that a command system is established, which includes a control centre from which the response to accidents can be supervised. The control centre will be located in the proximity of SIPROR's offices, and it is intended to control turn-outs with various means of conveyance from there. A responsible person will accompany each turn-out with a list of the resources that can be drawn on, if necessary. In the event of an accident, the following sequence is envisaged:

1. An alarm is received.
2. Its accuracy is verified.
3. An attempt is made to define the damage area.
4. Those responsible for the proper decisions are informed.
5. An intervention decision is made.
6. Members of the co-ordination committee are sent to the operations area to collect information, which will then be conveyed to the control centre.
7. When the situation is back to normal, a report will be prepared for the purpose of evaluation, with a view to development of the population protection system.

SIPROR has no forces of its own, but the plan is for it to co-ordinate efforts supervised by the Red Cross, the police, the fire brigades, and volunteers.

There are also plans for setting up a type of block protection unit, so that voluntary forces emerging during the earthquake disaster can be organized to ensure that there is always someone on the spot who can begin work if an accident does occur. However, there is no intention of supplying these block protection units with actual equipment.

III. INSPECTION OF THE EARTHQUAKE RUINS

During a guided tour of the earthquake ruins, the consultants saw evidence that craftsmen were working intensively to demolish and repair the many buildings that had been wrecked. Many of the buildings had already been demolished, others had had several storeys or sections removed. Apparently, the rest were to be repaired, even though the supporting structures were also seriously damaged.

The technical department of the city corporation of Mexico City had been given the task of inspecting all damaged buildings of more than four storeys, to determine which could be repaired and which were to be demolished.

Several thousand damaged buildings had already been inspected; about 500 of them had been condemned and another 800 were so severely damaged that the necessary repairs had to be approved by the authorities. Approximately 7,000 buildings were only slightly damaged, and the owners were allowed to carry out the repairs themselves without further approval.

The consultants' immediate impression was that there was great uncertainty on the technical level as to the standards that were required to secure new and old buildings against earthquakes; this uncertainty extended to the consequences of any future earthquakes, should Mexico City be struck again.

A. Mode of collapse and rescue work

The most seriously damaged buildings were those made of reinforced concrete where the concrete surrounding the reinforcing steel had been loosened so that either the columns had tipped over or the horizontal partitions and secondary walls had collapsed.

The types of collapse, very often all three in the same building, were either in the form of:

- Pancake collapse.
- Oblique collapse.
- V-shaped collapse.

It was a characteristic feature in most of the buildings viewed by the consultants that there were many horizontal cavities, which would make it possible to work forward towards a trapped person. The horizontal cavities in the buildings seemed to provide reasonably good prospects of locating anyone trapped there; this would be better than by working down from the top (experience has shown that the propagation of sound is more than five times greater horizontally than vertically). It must be concluded that a comprehensive, well-established, well-controlled, and smoothly operating rescue service would have been able to extract a large number of wounded and non-wounded trapped persons.

B. Visit to the main fire station

During a visit to the main fire station the consultants learned that there were a total of 48 men on duty at all times, and that there were a further six stations in Mexico City, each with 28 men, corresponding to a

station for every 2 million to 3 million inhabitants. By comparison, New York City has 8 million inhabitants and has 200 fire stations (one fire station for every 40,000 inhabitants). Copenhagen has a population of 1.5 million and 16 fire stations (one fire station for every 93,700 inhabitants).

The alarm centre simply consisted of seven telephones.

IV. CIVIL DEFENCE IN DENMARK

Information was given by the consultants on the system of civil defence in Denmark, as follows:

- It was emphasized that Civilforsvarsstyrelsen is not a military organization; Denmark operates according to a concept of total defence, so that all means will be brought into action to ensure that the country can continue to operate if a disaster should occur.
- A summary of the objectives of the Danish Civil Defence Act, with emphasis on the fact that Denmark considers war to be one of the disasters that the country may be exposed to, but otherwise, apparatus is used when other disasters occur. Some time was spent on explaining the fact that Civilforsvarsstyrelsen is used in times of peace, because it is not part of Mexico's assumption to plan for the possible outbreak of war.
- Preventative measures: warning, evacuation, shelters, and information.
- Remedial measures, including auxiliary forces, ambulance service, and medical and health preparedness.
- Multi-function measures, including command structures and signal service.
- The responsibility for co-ordination of civil emergency planning.
- Presentation of the English version of a film: "Also to-day", covering the peacetime commitments of Danish civil defence.
- The structure of society in Denmark, the role of the Government and the Danish Parliament, and the framework of the legislative system. The Ministry of Justice is responsible for the police and the fire services, but the actual authorities responsible for the fire brigades are the individual local councils. Military defence is the responsibility of the Ministry of Defence. The duties of the Ministry of the Interior include civil preparedness, medical and health preparedness, and the local administrations. A summary of civil preparedness was presented - the individual ministries responsible for planning within their respective domains - also in relation to any accidents. The Ministry of Agriculture is thus responsible for planning the food supply; the Ministry of Energy is responsible for oil supplies, for example; the Ministry of Traffic is responsible for transport, road repairs etc.
- Hand-out of a brochure "Civil Defence - What Is It?".
- Based on the brochure, a rundown of Denmark's peacetime organization - the internal one in the National Civil Defence and Emergency Planning Agency and the structure of the civil defence regions in peace and war as well as the organization of the civil defence mobile columns.
- Summary of the emergency plans for civil defence.

- Summary of the mobilization plans for civil defence.
- Summary of operations procedures and how operations in a damaged area go on; co-ordination of an operation; and the exchange of information at the various levels.
- Presentation of the civil defence training film, "COBRA", on the duties of the population in times of war.
- Objects and tasks of the rescue service.
- Structure and operations procedures of the rescue services.
- Rescue service training for officers as well as ratings - and a summary of training of the personnel in the civil defence mobile columns.
- Hand-out of a brochure "Introduction to the Rescue Service".
- Summary of the training structure for manual personnel, intermediate staff, executive staff, and commanders.
- Curricula for all types of personnel.
- Training aids.
- Training methods.
- Exercises.
- Control and evaluation.
- Summary of training programmes for possible foreign participants in Danish courses.
- Hand-out of a book "Proposal for Officer Training Courses. Training Areas at Training Centres. Hardened Buildings. Civil Defence Vehicles and Equipment. Chemical Laboratory Facilities. Exchange of Personnel". This book provides information on the type of training that could be offered to Mexico utilizing some equipment in Denmark, and on the prospects for establishing training areas.

V. CONCLUSION - FUTURE CO-OPERATION

It is evident that SIPROR has no actual rescue service of its own, and the consultants believe that an actual rescue service would have been able to extricate a much greater number of trapped persons. The consultants, therefore, feel justified in stating that a well-developed, well-managed, and smoothly operating rescue service would have been able to save more lives.

What is required in similar situations are:

- A large number of trained executives with a knowledge of building construction and their characteristic modes of collapse, accompanied by knowledge of the quickest and easiest methods for locating and rescuing people from damaged buildings.
- A large work-force, including volunteers, to work in the ruins - with the ability to administer first aid to the injured and to perform the most basic lifting and strutting work during their penetration into the collapsed buildings.
- Communication equipment, bandages, other first-aid equipment, and tools to facilitate penetration into damaged buildings.

The present planning of a nationwide civil defence system as well as civil defence for the Federal district show a professional touch. Relevant analyses are being made which will clearly lead to a sound and firm foundation for decision-making on structures, tasks etc., in future Mexican civil defence. By a Presidential decree dated 6 May 1986, a basis has been provided for the establishment of a nationwide civil defence system to be incorporated into the existing institutional framework on the Federal as well as the state level. A sound foundation for future work appears to have been provided.

It was suggested that the next step in co-operation should be a visit by a Mexican delegation to Denmark, to take place during late July 1986, while the civil defence corps was carrying out a major exercise.

Future co-operation might include the exchange of information, including directives and regulations, training curricula, and technical literature relating to matters such as the training of rescue dogs.

Based on the experience of the consultants, future co-operation could, by way of example, be implemented according to the following guidelines:

1. A Mexican delegation could visit Denmark in July 1986.
2. Danish civil defence authorities could provide information on the establishment of a Mexican civil defence education system with associated physical facilities such as training grounds.
3. The Danish civil defence authorities could make manuals, textbooks and training curricula etc., available to the Mexican authorities - who would supply their own translations.
4. Mexican instructors could be trained in Denmark. They could then train their own colleagues in Mexico.

5. Denmark's National Civil Defence and Emergency Planning Agency could provide guidance on the acquisition of civil defence equipment.

6. Joint seminars could be held at suitable intervals in Mexico or Denmark in order to strengthen the development of Mexican civil defence.

Danish civil defence authorities would be pleased to assist countries that wished to avail themselves of know-how in this field. Grants for civil defence purposes are insufficient, however, to permit financing for future co-operation, and it is correspondingly difficult for Mexico to find ways and means to meet the costs associated with such a project. UNIDO should be asked to attempt to find ways to provide the necessary finance which could contribute to the saving of many lives if Mexico were to be hit by a disaster in the future.

Annex I

TENTATIVE PROGRAMME FOR A VISIT BY MEXICAN GUESTS TO DENMARK
FROM 14 TO 25 JULY 1986

- Sunday, 13 July: Arrival in Copenhagen.
- Monday, 14 July: Welcome and briefing.
Training of civil defence corps officers.
External training programmes.
Presentation of civil defence corps service manuals, textbooks etc.
Presentation of a tactical, operational game.
- Tuesday, 15 July: Briefing on the civil defence warning system.
Organization of training and exercise facilities at civil defence barracks.
Visit to the Control Centre at St. Dyrehave.
- Wednesday, 16 July: Presentation of the civil defence equipment and repair department, Glostrup, including inspection of depots.
Visit to the Greater Copenhagen civil defence: guests will be briefed on evacuation and feeding services and on volunteers.
- Thursday, 17 July: Visit to the civil defence analytical-chemical laboratory.
Briefing on the Environment Protection Agency.
Visit to the Control Centre, in the park at Bernstorff Palace.
Briefing on disaster relief research.
- Friday, 18 July: Civil emergency preparedness and hospital preparedness.
Visit to the Danish Fire Protection Association.
- Saturday, 19 July: Sightseeing in Copenhagen and North Zealand.
- Sunday, 20 July: En route to Jutland.
- Monday, 21 July: Visit to local civil defence.
Briefing on local civil defence.
Presentation of plant protection.
Visit to Control Centre.
Visit to local fire-fighting service.
Visit to Alert Control Centre.
- Tuesday, 22 July: Visit to civil defence mobile column.
Briefing on peacetime preparedness.
Briefing on the training of platoon leaders and conscripts.
Presentation of vehicles and material.
Presentation of practical training in rescue service etc.
- Wednesday, 23 July: Presentation of operational exercise (night).
Visit to billets at feeding unit.
Base section (day).
Presentation of operational exercise (evening).
- Thursday, 24 July: En route to Zealand.
Presentation of pollution-fighting exercise.
- Friday, 25 July: Evaluation of visit.

Annex II

CONTACTS

A. United Nations Industrial Development Organization

Herbert May, Head
Programme Development and Evaluation Branch

Baris Der Petrossian
Industrial Development Officer,
Construction and Building Materials Unit

Niels Biering
Industrial Development Officer,
Construction and Building Materials Unit

B. United Nations Development Programme

Silva Aranda, Principal

Juan Ayza, Asesor Principal en Desarrollo Industrial

Eva Schubert, Oficial De Programa

C. Royal Danish Embassy, Mexico D.F.

His Excellency, Ambassador P. B. Søndergaard, K.O.D.

Erling B. Hansen, Attaché

Fritz Christiansen, Secretary

D. Officials in Mexico City

Ministry of the Interior

Manuel Garcia Ancira, LL.B., Director de Coordinacion Interinstitucional

Guillermo Andrade Delgado, LL.B., Subdirector de Coordinacion
Interinstitucional

Edmundo Cordero Hernandez, LL. B., Jefe de Unidad Departamental

Ricardo Niño Garciacano, Jefe de Unidad Departamental

Jorge Espejdel Contreras, Jefe de Unidad Departamental

Departamento del Distrito Federal

Gen. Salvador M. Bravo y Magana, Director de SIPROR,
Secretaria General de Proteccion y Vialidad

Gen. Elleazar Santos Salinas

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