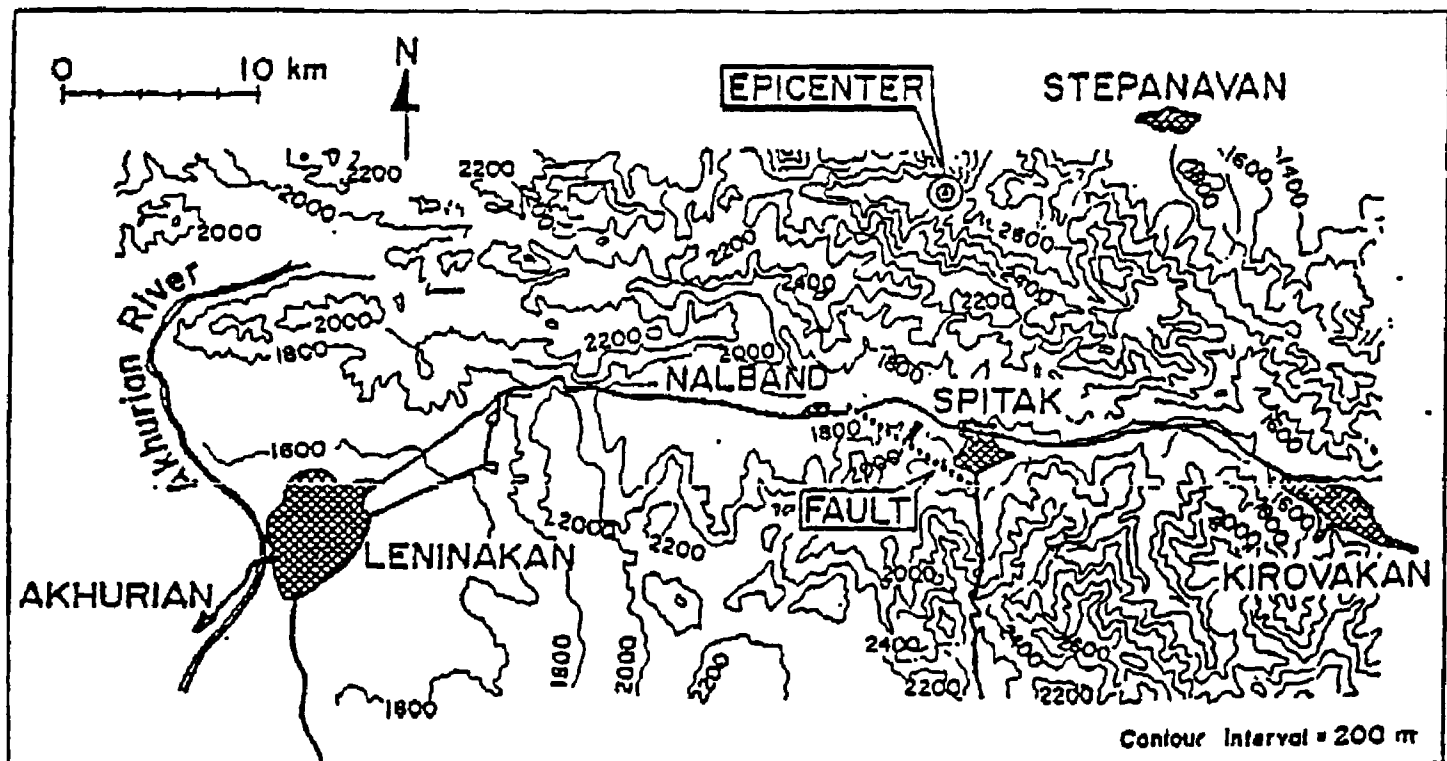


Map of Armenian Soviet Socialist Republic



Area of the Most Severe Damage

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ANNEXES

Annex 1 - International flights by country of origin

Annex 2 - List of Donations reported to UNDRO as of 31 January 1989

I) PURPOSE OF THE REPORT

1. This report outlines the main features of the international aid offered, during the emergency phase, to the victims of the earthquake of 7 December 1988 in the Soviet Socialist Republic (SSR) of Armenia.
2. It is based on the findings of a three-member UNDR0 evaluation mission which took place from 11 to 19 January 1989. The members of the mission visited the disaster sites and met with authorities and relief workers of the USSR and Armenian SSR both in Moscow and Yerevan, as well as with survivors of the disaster.
3. Two UNDR0 delegates were among the first to arrive at the disaster areas on 9 December 1988 and were present for most of the emergency phase. Their observations have been incorporated into this report.
4. The purpose of this report is not to make any judgements, but rather to draw lessons from the experience in the Armenian SSR in order to enhance the future effectiveness of international disaster aid.
5. The comments and evaluations in this report are not intended to be definitive, as it would take several months to assemble all the data and to compile a full evaluation of the events. Some comments may also reflect the opinions of mission participants and not necessarily represent those of the Office of the United Nations Disaster Relief Co-ordinator.

II) THE EVENT

6. The earthquake had a destructive magnitude of 6.9 on the Richter scale and hit an area of 80 kilometers in diameter, comprising the towns of Leninakan (290,000 inhabitants), Spitak (25,000 inhabitants), Stepanavan and Kirovakan in the northern part of the Armenian SSR. The earthquake struck on Wednesday, 7 December 1988, at 11.41 a.m. local time when children were at school and workers in factories (frequently high-rise buildings), causing a high number of deaths.
7. The town of Spitak was completely destroyed. Many buildings, both new and old, were damaged or destroyed in Leninakan. Areas of Kirovakan were severely damaged. Many rural villages in the 45 km span between Spitak and Leninakan (notably the village of Shirakamout situated near the epicenter) were destroyed.
8. Economic losses were aggravated by damage to the communications network (roads, bridges and railroads) and especially by the destruction/damage of several industrial facilities, including textile plants, granaries and a sugar plant.
9. The death toll as of mid-January 1989, though lower than the initial estimates, is staggering: 25,000 confirmed deaths. Extracted alive from the debris were 15,000 people, most of them during the first hours/days after the disaster. Of the 31,000 injured, 12,000 people were hospitalized. About half a million people, according to government estimates, were left homeless. Of these, 118,000 were evacuated from the area (78,000 outside the Armenian SSR).
10. In December 1988, the international and Soviet press put the number of estimated deaths at 55,000 (UNDR0 Situation Report No. 10 of 19 December 1988 had indicated a total of 50,000 to 60,000 estimated deaths). However, in January 1989 the Deputy Prime Minister of the Armenian SSR questioned the accuracy of this estimate. Although the final death toll cannot be determined precisely, the evaluation mission believes that a conservative estimate would be in the range of 30,000 to 35,000.
11. Soviet sources put the value of total damage at 10 billion roubles (US \$16 billion at the United Nations official exchange rate).

III) USSR ACCEPTANCE OF INTERNATIONAL ASSISTANCE

12. On 9 December 1988, UNDRO was officially notified by the USSR Mission in Geneva that international assistance would be accepted. Soviet officials remarked that such a decision would have been 'unthinkable' some years ago and represented a major change in USSR policy. A Soviet official noted that the USSR had accepted international assistance on only two past occasions. The first was during the great famine in the 1920's; the second was through the Red Cross during the Second World War.

IV) FACILITIES GRANTED BY THE USSR FOR INTERNATIONAL ASSISTANCE

13. Unlimited access was allowed to disaster areas.

14. In addition, the Government of the USSR took extraordinary measures to facilitate the flow of international aid. The following are particularly worth mentioning:

- i) Visas were granted on the spot to relief workers and journalists upon their arrival at Yerevan airport;
- ii) Free transport of international relief assistance was provided by Aeroflot;
- iii) Free fuel was offered to international relief flights for their return journeys;
- iv) Unrestricted access to airports in disaster areas was given for all kinds of aircraft, including military;
- v) Handling fees were waived for foreign relief flights;
- vi) International assistance was exempt from customs and other duties.

15. It is too early, and may prove difficult even later, to quantify the results of these measures, but they certainly had a multiplying effect on the international assistance, as could be seen by the many Aeroflot flights carrying relief goods to the Armenian SSR from all over the world.

V) ASSISTANCE MEASURES TAKEN WITHIN THE USSR

16. A description of the relief assistance provided within the USSR would be beyond the objectives of this report. After cutting short his official visit to the United States, Mr. M. Gorbachev, President of the Soviet Union and General Secretary of the Communist Party, surveyed the disaster areas on 10 and 11 December. The day of 10 December was declared a national day of mourning. Mr. N. Ryzhkov, Prime Minister of the USSR, headed a commission of the Politburo of the Communist Party specially designated to oversee the relief and rehabilitation operations.

17. It has been estimated that 90 percent of all the relief assistance came from within the USSR. Of the 1,400 flights with relief items registered at the time of writing, more than 1,050 came from the Soviet Union. But most of the Soviet help came by railway. It was reported that already by 19 December 1988, 27,000 rail cars of relief supplies had reached the area.

18. A Soviet official valued USSR emergency help, including grants to affected families, at one billion 900 million roubles (US \$3.2 billion at the official United Nations exchange rate).

19. Various organizational difficulties experienced during the emergency phase were reported by the Soviet and foreign press. In this regard, the exhaustion of relief workers, some of whom had been working incessantly despite the loss of members of their families, should be taken into account.

VI) THE RESPONSE OF THE INTERNATIONAL COMMUNITY

a) Volume

20. The earthquake in the Armenian SSR led to a virtually unprecedented show of international solidarity, in terms of both magnitude and geographical representation.

21. The total foreign relief aid was the highest reported to UNDRO for a single, recent natural disaster. As of 31 January 1989, emergency contributions reported to UNDRO amounted to *US \$117 million* (of which US \$58 million came from governments and United Nations organizations, US \$12 million from intergovernmental organizations, US \$24 million from Red Cross and Red Crescent Societies and US \$23 million from other sources). The sum of US \$117 million excludes contributions in kind and services, including rescue teams, for which the donors did not indicate any value to UNDRO. Thus the actual total amount could be much higher.

22. As of January 1989, relief supplies had been airlifted on 348 flights (many by Aeroflot) from at least 45 countries, as reported in Annex 1.

23. Most international support to the Armenian SSR was in kind and in services. As of 31 January 1989, cash contributions amounted to US \$18 million, or 15 percent of the total aid. However, the value of cash contributions and their proportionate share of total contributions are likely to rise substantially, when current fundraising efforts have been completed and donors have allocated funds for specific projects. Most of this cash will probably be used for recovery and rehabilitation.

24. Donor participation in the relief effort reflects a particularly wide geographical representation from all continents, irrespective of political inclinations. According to UNDRO's records, the following 67 countries provided emergency assistance:

Afghanistan, Algeria, Argentina, Australia, Austria, Bahrain, Belgium, Bulgaria, Canada, Chile, People's Republic of China, Colombia, Cuba, Cyprus, Czechoslovakia, Denmark, Egypt, Finland, France, German Democratic Republic, Federal Republic of Germany, Greece, Holy See, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Jordan, Kenya, Democratic People's Republic of Korea, Republic of Korea, Kuwait, Lebanon, Libya, Luxembourg, Madagascar, Monaco, Mongolia, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Poland, Portugal, Romania, Saudi Arabia, Singapore, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syria, Turkey, Uganda, United Arab Emirates, United Kingdom, United States of America and Yugoslavia.

25. The list shows that donations arrived not only from "traditional" donors but also from many other countries. The multitude of donors obviously had an impact on the variety and quality of goods donated.

26. Among the donors, Turkey (where the earthquake also provoked casualties) offered foreign countries the possibility of moving their relief aid through its territory.

27. At the peak of relief operations, some 1,000 foreign workers were in the disaster areas alongside the reported 30,000 army and civilian workers from the Armenian and other Soviet Socialist Republics. There was a kaleidoscope of different languages and operating methods which, even under normal circumstances, would have been difficult to organize and co-ordinate.

28. It should be noted that a substantial portion of both governmental and non-governmental contributions, was channeled through either the League of Red Cross and Red Crescent Societies (LRCRCS) or national Red Cross societies, which provided assistance directly or through the Soviet Alliance of Red Cross and Red Crescent Societies.

29. LRCRCS Situation Report No. 14 of 16 January 1989 indicated that 227 of all international flights carried Red Cross relief items from 40 national societies. Altogether, 552 Red Cross delegates visited the Armenian SSR. The breakdown, excluding USSR delegates, was as follows:

- 341 members in Red Cross rescue teams from 7 national societies
- 30 medical experts from 5 national societies
- 159 representatives and relief workers from 20 national societies
- 18 journalists sent through national societies
- 4 delegates from the secretariat of the League.

The following is a summary of contributions by category of donor, with governmental contributions listed by country:

UN SYSTEM		US DLRS
-----		-- ----
- UNDR0:	Emergency grant	20,000
	two relief flights from Pisa warehouse	
- WHO:	Assessment team from Copenhagen	(++)
GOVERNMENTS		

- Algeria:	Rescue teams (3 relief flights)	* 1,000,000
- Australia:	Cash through LRCRCS	434,782
- Austria:	2 relief flights, 119 rescuers, 28 tons relief supplies	524,999
- Belgium:	2 relief flights with Red Cross and Medecins Sans Frontieres	415,512
-* Bulgaria:	Relief flights with rescue teams	(++)
- Canada:	Cash, relief supplies and transport	4,663,864
-* Chile:	Relief supplies	20,000
-* China P.R.of:	Food and clothing through Red Cross	(++)
-* Cuba:	Relief flight	(++)
-* Cyprus:	Relief supplies, cash	22,000
- Czechoslovakia:	Relief supplies, trains	1,500,000
- Denmark:	Cash through Danish Red Cross	1,204,818
- Finland:	Medical supplies through Red Cross, Mobile hospital, blankets through UNDR0	673,851
- France:	497 Rescuers, 54 dogs, 1,470 MT relief Supplies by air, sea, road and rail	3,856,652
- German Dem.Rep.:	2 relief flights	* 868,558
- Germany, Fed. Rep. of:	Heavy equipment, communications, Rescue teams, relief supplies, flights	10,477,902
-* Greece:	Relief supplies	(++)
- Holy See:	Cash	100,000
-* Iceland:	Cash, transport of blankets	54,989
-* India:	Relief flights	100,000
-* Indonesia:	Relief supplies	(++)
- Ireland:	Cash through Irish Red Cross	155,038
- Israel:	4 relief flights with rescue teams	(++)
- Italy:	Relief flights, communications, rescue Teams, relief supplies	2,237,354
- Japan:	Cash through Red Cross, relief supplies, Airlifts of tents and blankets through UNDR0	10,026,767

GOVERNMENTS Cont'd

-* Kenya:	10 mt tea, 3 mt of coffee	16,400
-* Korea, Rep of:	Rescue teams, supplies	2,000,000
- Luxembourg:	Cash	277,008
-* Madagascar:	Medicines, volunteers	(++)
- Mongolia:	Medicines, 50 mt canned meat, tents	(++)
-* Morocco:	Airlift of medical and shelter supplies	(++)
- Netherlands:	Medical supplies, communications through LRCRCS	1,538,461
- New Zealand:	Cash through LRCRCS	32,679
- Norway:	Cash, supplies, rescue team	* 770,000
-* Pakistan:	Relief supplies	(++)
-* Poland:	Rescue team, relief supplies	(++)
- Romania:	1 relief flight with supplies	(++)
-* Saudi Arabia:	Relief supplies	500,000
-* Singapore:	Relief supplies	20,000
- Spain:	Relief supplies through Spanish Red Cross	474,839
-* Sri Lanka:	5 mt tea	(++)
- Sweden:	Cash through Red Cross, 4 relief flights with rescue teams, supplies and equipment	1,249,999
- Switzerland:	Rescue/medical teams, 2 relief flights	819,443
-* Syria:	Relief flight with supplies	(++)
- Turkey:	4 truckloads of medical supplies	252,576
- Uganda:	Emergency services	(++)
-* United Arab Emirates:	Relief supplies	(++)
- United Kingdom:	Relief flights, supplies and equipment, rescue teams	9,519,336
- USA:	8 relief flights, rescue teams, Supplies and equipment, cash	1,910,451
-* Yugoslavia:	Supplies	149,000

Total US \$58 Million

INTERGOVERNMENTAL ORGANIZATIONS

-* Agfund:	Cash	50,000
- EEC:	funding of 38 relief flights (with NGO's and Red Cross), relief supplies, prefabs	11,976,042

Total approx. US \$12 Million

RED CROSS AND RED CRESCENT SOCIETIES

Afghanistan, Algeria, Arab Red Cross and Red Crescent Societies, Australia, Austria, Bahrain, Belgium, Bulgaria, Canada, Columbia, Cyprus, Czechoslovakia, Denmark, Finland, France, German Democratic Republic, Federal Republic of Germany, Greece, Hungary, Iceland, India, Iran, Ireland, Italy, Japan, Democratic People's Republic of Korea, Republic of Korea, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Pakistan, Poland, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States of America and Yugoslavia

Total US \$24 Million

OTHER SOURCES

Total US \$23 Million

* Subject to Verification
(++) Value not reported to UNDRO

Grand Total US \$117 Million

30. A large portion of foreign help came from local communities, Armenian groups, private citizens and religious groups abroad. Fund raising campaigns were organized by leading newspapers, charity records were issued by famous singers, concerts of modern and classical music were held. This help is reflected in UNDRO's statistics only to a limited extent, as some of the revenues from these initiatives are still being gathered.

31. A full list of donations reported to UNDRO by 31 January 1989 is contained in Annex 2.

b) Timing

32. International assistance arrived at Yerevan as soon as administrative formalities were completed. The first rescue team to arrive, 53 hours after the earthquake, was the French, followed immediately by the Swiss team and UNDRO.

First arrivals of international assistance at Yerevan, as reported by the local airport authorities

Origin	Type of aircraft	Date of arrival	Hour	On Board
1) Government of France and medical equipment	C-130	9 Dec.	16.30 hrs	84 rescuers and Medical Equipment
2) Government of Switzerland	DC-9	9 Dec.	18.17 hrs	37 rescuers
UNDRO's two delegates	commercial Aeroflot flight	9 Dec.	18.30 hrs	
3) Government of France	C-130	9 Dec.	19.00 hrs	85 rescuers

33. After these, the in-flow of aid became hectic. Soviet officials mentioned the problems arising from trying to cope with landings ten times more frequent than normal, and the enormous amount of time, manpower, equipment and transport means required just to unload the materials donated and take them to warehouses.

34. They repeatedly raised one point which, in their view, aggravated co-ordination difficulties, namely that some donors either did not announce their flight or gave erroneous or insufficient information about their cargo.

35. While donors duly informed UNDRO of their assistance, whether in cash, kind or services, the information generally reached the Office too late and without sufficient data to enable it to alert the Soviet authorities involved in relief operations. If all donors had communicated their interventions to UNDRO before they actually took place, and with all the operational data required, the Office could have assisted the Soviet authorities more efficiently in developing a well co-ordinated relief programme. More timely information conveyed to UNDRO would also have facilitated other donors' planning.

36. International emergency assistance continued to flow into the country even long after the emergency phase was declared to be over and emergency needs fully met. On the eve of their departure from Yerevan on 16 January 1989, the evaluation mission was notified by Soviet officials that international relief flights were continuing to land with unsolicited emergency supplies, and that an additional 30 to 40 foreign relief flights were still expected.

37. One may deduce that preparations for at least some of these flights had started in the donor country prior to the announcement that emergency needs were fully met. On the other hand, some donors, particularly among non-governmental organizations and private sources, possibly believed that the affected people in disaster areas would need basic items like clothing or blankets even during the rehabilitation phase. Nevertheless, these arrivals had the effect of further jamming the warehouses already filled to capacity.

38. As of mid-January 1989, some ten foreign relief agencies were still operating in the disaster areas. These included a medical team from the Swiss Disaster Corps in the village of Ghuziakan, a government team from the Federal Republic of Germany assisting in the repair and restoration of the logistics and communications network, a team from the Red Cross of the Federal Republic of Germany providing logistics support in the town of Stepanavan, Médecins Sans Frontières (France, Belgium, Holland) operating health posts in Leninakan and giving medical assistance in Yerevan hospitals, Médecins du Monde operating in the village of Artik, SOS Arménie arranging the delivery and distribution of contributions in kind from France, Aide Médicale Internationale (AMI) and the Adventist Development Relief Agency (ADRA).

c) Role of International Media

39. By focusing daily world attention on the fate of the victims, the television and press played a key role in stimulating international aid. Disaster coverage benefited from the great amount of information made available by the Soviet media and was on the whole, extensive and accurate. The open and self-critical attitude of the Soviet authorities greatly facilitated objective reporting. On the other hand, a few reports and interviews on certain individual aspects of the emergency made donors' decisions more difficult regarding the type and timing of their donations.

40. The case of the Armenian tragedy should be taken into account in future meetings on the role of the media in disasters which UNDRO plans to organize.

d) Type of Donation

i) Search and Rescue Teams

41. Soviet officials could not indicate to the evaluation mission how many of the 15,000 people rescued alive from ruins and debris were extracted by foreign teams. They confirmed, however, that most of the people were saved in the first hours after the disaster (i.e. before the arrival of the foreign teams).

42. As in other disasters, it seems that a major role in rescue was played first by relatives, friends and neighbours, then by local authorities and relief workers sent from Yerevan and Moscow. The Minister of Health of the Armenian SSR, Prof. E.S. Gabrielyan, said that, after feeling earthquake shocks in Yerevan and hearing that communications with Leninakan and Spitak had been cut, he dispatched "brigades" of medical specialists there without any idea as to the size of the disaster. Mr. Alexei M. Moskvichov, Deputy Minister of Health of the USSR, noted that, by 15.30 hrs on 7 December, teams of Soviet medical specialists were ready for departure at Moscow airport and by 20.00 hrs had started working in the disaster areas. He said that the work was most difficult during the first night, since it had to be carried out on the street without lights or electricity.
43. The Soviet authorities commended the work carried out by the foreign teams. Praise was general also among USSR relief workers. During emergency operations, the local population openly manifested gratitude towards the teams. This was due to the recognition that, with their sophisticated equipment, they were saving lives and recovering bodies and belongings in especially difficult cases. It should be recalled that, thanks to the co-operation between Soviet and foreign rescuers, survivors were reportedly extracted from the debris as late as 26 December 1988 (19 days after the earthquake).
44. The arrival of foreign teams and equipment brought welcome relief to the Soviet workers, who had been working without respite under strenuous circumstances.
45. The most efficient rescue teams were those which were totally self-sufficient. Unfortunately, some were not. For instance, quite a number did not take along vehicles and therefore had to rely on local transport which was not always available. Of course, the airlifting of vehicles takes space and much preparation, but the advantages in the disaster areas are probably worth the effort.
46. A number of teams did not take along appropriate equipment to search for trapped victims. It is suggested that this matter be reviewed in the context of a specific workshop.
47. Another problem experienced by some rescue teams was the lack of local accommodation. Each team should be fully autonomous with regard to shelter and basic supplies.
48. It was reported that exhaustion and the difficult working environment had a negative impact on the performance of some dogs during the most critical phase.
49. It was noted that many rescue teams had satellite communication systems with their foreign headquarters. What they lacked most, however, were communication links with each other in the disaster area, so as to better co-ordinate their operations. A link between teams and other relief workers would also have been most useful.
50. A number of teams included interpreters. Others had none, which rendered their contacts with the local population difficult. It would have been an important asset to have interpreters, if not in Armenian, at least in Russian.
51. Finally, great disparities existed among rescue teams. Many were composed of competent, qualified staff. Others were not, creating a burden rather than facilitating relief operations.
52. Evidently, authoritative sources of information on the capabilities of the various medical and search and rescue teams pouring in were not at the disposal of the Soviet authorities. Had this information been available, specific tasks could have been assigned to them on the basis of their competence.
53. UNDRO field delegates maintained contacts with foreign rescue teams. However, the evaluation mission did not meet the teams before they left. Their views and experiences will, of course, be most valuable for completing these initial observations. To this effect, the Office envisages holding a meeting with representatives of the teams in order to exchange ideas on this relief operation and on the lessons which may be drawn for the future.

ii) Search and Rescue Equipment

54. The grave lack of rescue equipment in the initial stages^{*} was widely reported in the Soviet and foreign press. At that time, people were obliged to dig with their bare hands, and the provision of simple items like gloves and lamps would have been very useful. At a donors' meeting organized by UNDRO in Geneva on 12 December 1988, the USSR representatives requested cranes and equipment to cut through cement and steel in order to reach trapped victims. Following this and other Soviet requests, various donors donated cranes and cutting devices for the mechanized removal of the debris.

iii) Medical Aid

55. The earthquake destroyed the area's medical facilities and killed or injured doctors and nurses.

56. Soviet authorities indicated that local doctors who had survived, some of whom had lost close relatives, were quickly overwhelmed by the dimensions of the disaster. Thus there was an immediate need for additional medical staff, including from abroad.

57. Their task was a difficult one. Medical attention had to be provided to trapped people suffering not only from injuries but also from severe cold and exposure. Evacuations had to be arranged despite a shortage of vehicles, traffic congestion and communication problems. In the end, some victims had to be transported over long distances on damaged roads before reaching functioning hospitals.

58. Most needed during the first days was a core of flexible, multi-skilled physicians with practical experience in disaster situations, able and equipped to administer basic medical care to victims, including trapped people.

59. According to a Soviet official, there were at one time 1,200 doctors in the disaster area, including over 400 from abroad. However, since most of the medical attention was required within the first 48 hours, it would have been much more effective if international medical staff could have arrived earlier (cf. para. 32).

60. The need for generalists soon came to an end, but the in-flow of unspecialized, unrequired medical personnel continued unabated.

61. A Soviet official stated that foreign specialists in fields such as the treatment of serious injuries, bone crushes complicated with infections and crush syndrome were in short supply during the emergency phase. He admitted that doctors of a generalist type, though no longer necessary at the current stage, might be needed in rural areas during the rehabilitation phase.

62. Soviet authorities noted that local supplies of medicines and medical equipment were rapidly depleted. One of the main problems was to treat the unprecedentedly high number of 800 victims of crush syndrome. In this connection, medical supplies from abroad were most beneficial. Nevertheless, there was an over-supply of artificial kidneys and dialysis machines following a generous response to initial requests. The following factors hindered the effective use of some donated medical supplies: labels not always in generic terms and in foreign languages of all sorts, the inadequate sorting and packing of medicines, the provision of medicaments whose validity had already expired, and medical equipment without all the necessary components.

63. At one time there was an excess of certain donated medicines, including blood and blood substitutes.

64. Donations of field hospitals were discussed. The evaluation team visited the first one which had arrived at the disaster site one week afterwards. Its large size had made transport by mountain roads cumbersome. Its position in a 'rubbhall' tent presented temporary heating problems, which were later overcome. On 14 January 1989 no patient was being treated there.

65. The field hospitals donated will be very useful during the rehabilitation phase.

66. A Soviet official advocated the need to establish small, compact, easily adaptable and transportable field hospitals, fully self-sufficient with regard to accommodation, power and possibly fuel needs.

iv) Tents

67. At the beginning of the emergency phase, when the affected people had to be accommodated in temporary shelter pending their evacuation or settlement with relatives and friends, tents were extremely useful but in short supply. Donors were generous in responding to this need. Tents continued to arrive in Yerevan from abroad, even after the Soviet authorities, UNDRO and the League of Red Cross and Red Crescent Societies had declared that the need had already been met.

68. When the evaluation team visited the disaster sites, it noticed that only a limited number of affected people were still living in tents. Alongside the tents, some people had erected traditional-type, felt/skin huts called 'djurta', which offered better protection against the cold. Large camps of Soviet tents did exist particularly around Spitak, but they were inhabited by workers involved in rehabilitation work. In this connection, it is worth noting that one League delegate praised the quality of these Soviet-fabricated round tents, their adaptability to the climate and ease of installation.

69. Indeed, only heavy-duty winter tents with heaters were suitable for the cold temperatures registered in the disaster area, as stressed in UNDRO's reports. But Soviet authorities argued that the type and quality of tents donated by the international community were most varied. Many were summer tents.

70. According to a Soviet official, the tents should have been able to sustain an inside temperature of + 22 ° Centigrade while outside it was -15 ° Centigrade.

71. One Red Cross worker noted that a winter tent appropriate for one country would not necessarily be so for another and that international standards for determining the features of winter tents do not exist. Generally acceptable parameters should therefore be developed for different climatic conditions, especially with regard to temperature, wind and rainfall. In any case, the tents should obviously be resistant to humidity, with double entry, thick groundsheet and double cloth. Heaters should be placed in the centre of a tent, not in the corners.

72. The experience in the Armenian SSR, where planes were unloaded one after the other and relief goods brought immediately to warehouses, proved again that heaters and other components for tents should be sent in the same plane with the tents.

73. It should be recalled that since November 1987, a Working Group on Donors' Response to Disasters, consisting of WHO, UNICEF, UNDRO, the League of Red Cross and Red Crescent Societies and Food for the Hungry International has been meeting in Geneva to define a common set of guidelines to be applied by all donors for appropriate relief supplies. Among its tasks, the Working Group may wish to include the development of appropriate parameters for winter tents. The other observations on relief supplies contained in this report may also be useful for the deliberations of the Working Group.

v) Other Shelter Materials (plastic sheeting, etc.)

74. Greater supplies of shelter materials would have been very useful to help people arrange temporary habitation and meet other needs in the aftermath of the disaster. Few donors provided these items, for which no request was made. It was noted that these materials are produced and largely available in the USSR.

vi) Blankets

75. Blankets dispatched from abroad were not always of the heavy-duty winter type; some were light and not adapted to local conditions.
76. Some donors continued to send blankets, although the need for them had been met.

vii) Clothing and Shoes

77. UNDRO notified donors already in its Situation Report No. 7 of 14 December 1988 that there was "no further need for clothing". However, large shipments of clothing continued to arrive in the disaster area.
78. In fact, the oversupply of untidy, unsorted clothing appeared to be almost "a disaster within a disaster". The fact that much of it was second-hand would not have mattered so much, if it had been properly fumigated, sorted by category, age group and sex, and clean for use. Unfortunately, this was not the case; summer sandals and heavy clothing were mixed in the same bag. Packing was inappropriate and inadequate, making distribution even more difficult. The evaluation team was told of at least one instance where, after checking the type and quality of clothing donated, the people in one rural village refused to accept it and obliged the truck to return to Yerevan.
79. The key question is the sorting out and proper packing of clothing prior to its dispatch from the donor country. Of course, this takes time but can be carried out much more effectively in the donor country than in the disaster area, where relief workers should not be diverted from other emergency tasks.
80. It should be noted that Soviet officials reported also donations of tidy, appropriate clothing which was professionally sorted and packed.
81. Many donations of clothing came also from within the USSR.

viii) Food

82. Food quickly disappeared from the list of items being requested from the international community, and only small quantities were donated from abroad. However, instances were reported of donated food which was unfit for human consumption and had to be destroyed.

ix) Communications

83. It was stated that, at one stage of the relief operations, 16 satellite communication stations belonging to donors and rescue teams were operating in the Armenian SSR. From the second day after the earthquake, UNDRO delegates had the benefit of a direct telephone and telex link, through the Armenian Ministry of Foreign Affairs, to UNDRO Headquarters in Geneva and the United Nations Information Centre in Moscow.
84. However, local communication problems existed and were serious. First, the Armenian Minister of Health observed that the lack of communications in the immediate hours after the disaster, when he was called upon to take key decisions, was the most difficult problem he had to face. Second, communications among relief workers operating in disaster areas remained difficult for a long time. For a while, the only way to communicate was to move physically from one place to another, with all sorts of complications and delays due to the shortage of vehicles and traffic congestion.
85. Attention should be paid to setting up a simple communications network among search and rescue teams and between them and the co-ordinators of domestic and international relief.

e) Aspects of Needs Assessment, Storage and Distribution

86. The storage and distribution of foreign relief supplies were under the responsibility of the Soviet authorities (mainly the competent ministries and the army). Some donors, particularly non-governmental organizations, arranged for distribution of the goods they had brought in on their own.

87. An in-depth analysis of the internal mechanisms for storage and distribution, as well as the related logistics constraints,¹ does not fall within the scope of this report. The preliminary observations below relate only to some aspects of this question which came to the attention of the UNDR0 missions.

88. With the massive in-flow of aid, it was noted that warehouses in the disaster areas were filled to capacity and that the magnitude of the supplies donated was such, that much of the effort had to go just towards the unloading and storing of donations. It then became extremely difficult to devote appropriate time and staff resources to distribution and, at the same time, ensure smooth handling of the aid pouring in. Under the circumstances, the statement that all needs had been met reflected, more than the factual situation, the fact that the absorption capacity of disaster areas had reached its upper limits, and that only a stop to emergency contributions would avoid a delay in distribution.

89. It should be added that since UNDR0 did not receive any initial assessment as to the quantities of relief supplies like tents and blankets required from abroad, it was later difficult to compare needs against deliveries and verify outstanding requirements.

90. The problems encountered with regard to needs assessment, logistics and distribution and the ways of overcoming them could best be reviewed through an overall plan for improving disaster preparedness measures.

91. The joint mission to the Armenian SSR undertaken from 11 to 19 January 1989 by UNDR0, the World Health Organization (Headquarters and the Regional Office for Europe in Copenhagen) and the League of Red Cross and Red Crescent Societies - in the context of which UNDR0 carried out this evaluation - concluded that: "Experience from the earthquake showed to the Soviet authorities that the strengthening of disaster preparedness is of primary importance. Within the context of the International Decade for Natural Disaster Reduction, the three organizations (UNDR0, WHO, LRCRCS) are prepared to co-ordinate their efforts to provide expert services, according to their respective mandate, towards this end in priority sectors to be agreed upon (such as training, communications, setting up of computerized information systems, epidemiology and environmental health)."

92. With regard to on the spot distributions effected by some donors, a Soviet relief worker mentioned instances of disparities of treatment among people equally affected, inappropriate gifts and dubious forms of publicity or self-promotion associated with them. On the other hand, a representative of a foreign non-governmental organization stated that affected people were measuring the performance of donors by their ability to arrange their own distribution.

¹ A Soviet worker remarked that the traffic jams which made access to disaster areas so difficult during the initial days could have been avoided if private citizens and relatives of the affected people had taken secondary roads, instead of the few main highways. He admitted, however, that there was a local lack of detailed maps, noting that these were more easily available with some foreign search and rescue teams.

VII) CONCLUSIONS AND RECOMMENDATIONS

93. The conclusions of this report may be summarized as follows:

- The earthquake in the Armenian SSR led to an almost unprecedented demonstration of international solidarity, both in terms of volume and geographical spread of donors; as of 31 January 1989, total foreign emergency aid amounted to US \$117 million from 67 countries (excluding contributions in kind and services for which no value was indicated), the highest reported to UNDRO so far for a single recent natural disaster.
- The huge amount of international aid was due also to the extraordinary measures taken by the Soviet authorities to facilitate its in-flow.
- The sum of US \$117 million does not take into account all cash contributions (which so far amount to for only US \$18 million or 15 percent of the total) since complete data on private initiatives are missing and fundraising campaigns are continuing. Funds still being collected or not yet allocated to specific projects will be used for recovery and rehabilitation.
- The volume of assistance provided from within the USSR was much greater than that provided from abroad.
- Donors duly informed UNDRO of their contributions and value. However, on the whole, this information was transmitted too late to allow the Office to assist the Soviet authorities more effectively in mounting a well co-ordinated relief programme. Advance information conveyed to UNDRO on contributions would also have facilitated the planning of other donors.
- By focusing daily world attention on the fate of the victims, the television and press played a key role in stimulating international aid. The disaster coverage benefited from the great amount of information made available by the Soviet media and by the open attitude of the Soviet authorities. It was, on the whole, extensive and accurate.
- Search and rescue teams started to arrive in Yerevan as soon as feasible. While most of the survivors had already been extracted from the debris, their assistance in saving lives and recovering bodies and belongings was widely appreciated by both the authorities and affected population. Beyond the number of lives saved, it was the gesture of human solidarity which was especially felt at that time of distress.
- The Soviet authorities did not have at their disposal authoritative source(s) of information, permitting them to select search and rescue and medical teams on the basis of their competence.
- Untidy, unsorted and inappropriate clothing was dispatched to the disaster area from abroad, complicating relief efforts.

94. Recommendations for future action on the basis of the experience in the Armenian SSR are indicated below. UNDRO has already stressed some of these on past occasions. Those which involve follow-up by the Office will be carefully examined in light of the current availability of staff and financial resources.

- Preferably, donors should give UNDRO advance notice of their contributions in kind and services, so that the Office may advise other donors and assist the disaster-prone country more effectively in its co-ordination efforts.

- Donors should refrain from sending emergency items when the authorities of the affected country and international relief organizations declare that needs are covered. Such action could result in jamming already filled warehouses and diverting relief workers from the distribution process.
- The case of the Armenian tragedy should be taken into account in future meetings on the role of the media in disasters.
- Procedures for the mobilization of search and rescue and medical teams should be reviewed in order to speed up their departure for the disaster site.
- UNDRO should develop a data bank on emergency teams, including an evaluation of their performance in previous disasters which could be made available to disaster-prone countries as appropriate.
- All Search and rescue teams should examine the possibility of taking along their own means of transport.
- The type of equipment and skills required to search for trapped people could be reviewed by all rescue teams in the context of a specific workshop.
- Search and rescue teams should be fully self-sufficient, including provision for interpretation and accommodation.
- Search and rescue teams should consider meeting to share, record and learn from their experiences in the Armenian SSR.
- A communications network among search and rescue teams as well as between them and the co-ordinators of international and domestic aid should be established.
- Among in-country preparedness measures, attention should be paid to setting up a group of flexible, multi-skilled physicians with practical experience in disaster situations, who are able and equipped to administer basic medical care to the victims.
- Medicines should be properly sorted, packed and labeled in generic terms, preferably in internationally used language(s) and, if possible, in the language(s) of the recipient country.
- While keeping UNDRO informed, precise and complete data on the cargo and passengers of international relief flights should be prepared in advance and submitted to local airport authorities.
- The modalities of use of mobile field hospitals should be carefully reviewed in light of the experience in the Armenian SSR.
- Generally acceptable parameters for winter tents with regard to temperature and other climatic conditions like wind and rainfall should be devised. Any components of such tents (for instance, heaters) should be dispatched in the same aircraft as the tents.
- Before sending clothing, donors should take the time and resources to sort and pack it properly. Second-hand clothing should first be dry-cleaned and fumigated.
- Organizational difficulties as well as problems encountered in needs assessment, logistics and distribution and the ways of overcoming them could best be reviewed by means of an overall effort to strengthen disaster preparedness measures. Within the context of the International Decade for Natural Disaster Reduction, UNDRO, with the co-operation of concerned United Nations agencies and NGO's, is prepared to offer its services and expertise towards this end.

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