SWEDEN

NATIONAL SUMMARY REPORT

IDNDR

Contact: Focal Point for IDNDR
Mr Stig Sjöstedt
Head of Division
Statens räddningsverk
(Swedish Rescue Services Board)
Karolinen
S-651 80 KARLSTAD, Sweden

Phone: (46) 54 10 40 00

Fax: (46) 54 10 28 89

Telex: 66197 SRV S

SECTION A: PROFILE

1. Composition of National Committee (Focal Point):

No Swedish National Committee. The following institutions and governmental agencies form a contact group and receive IDNDR-information from the Swedish Rescue Services Board (Swedish Focal Point)

Ministries

Ministry of Foreign Affairs (1)
Ministry of Defence (1)

Academic and Research Institutions

The Royal Institute of Technology (KTH) (2)
CITEC
100 44 STOCKHOLM
Contact: Rodolfo Candia

University of Uppsala (1)
Seismologen
Box 2101
750 02 UPPSALA
Contact: Ota Kulhanek

Department of Geophysics (1)
Villavägen 16
752 36 UPPSALA
Contact: Carl Erik Lund

Swedish Commission on Slope Stability (1)
c/o SGI
581 01 LINKÖPING
Contact: Elvin Ottosson

National Defence Research Establishment (FOA) (1)
172 90 SUNDBYBERG
Contact: Maria Broberg

Private Sector
none

Public Services
Swedish International Development Authority (SIDA) (1)
SEO-byrån
105 25 STOCKHOLM
Contact: Christina Regnell

Swedish Commission for Dam Safety (1)
Box 522
162 15 VÄLLINGBY
Contact: Åke Vikner

National Licensing Board for Environmental Protection (1)
Box 2121
103 13 STOCKHOLM

Swedish Meteorological and Hydrological Institute (SMHI) (1)
601 76 NORRKÖPING
Contact: Hans Sandeling

Central Office of the National Land Survey (1)
801 82 GÄVLE
Contact: Peter Landewall

Swedish Geotechnical Institute (SGI) (1)
581 93 LINKÖPING
Contact: Jan Hartlén

Geological Survey of Sweden (SGU) (1)
Box 670
751 28 UPPSALA
Contact: Curt Fredén

National Board of Housing, Building and Planning (1)

National Road Administration (1)
Röda Vägen 1
781 87 BORLÄNGE
Contact: Leif Pettersson

Non-Governmental Organizations
Red Cross (1)
Box 27316
102 54 STOCKHOLM
Contact: Christer Åquist

Media
None

Insurance
Swedish Insurance Federation (1)
Box 1436
111 84 STOCKHOLM
Contact: Jan Granmar

Others
None

2. Internal organization of the National Committee

No Swedish National Committee

3. Prevailing hazards

Type	Location	Affected population
Storms		
Floods	Along rivers - in, above all North and Middle Sweden	116 municipalities
Landslides	Coastal zones Along river valleys	Geological conditions for landslides exists in some 200 municipalities

4. Recent natural disasters

Type	Location	Affected population	Losses
Floods 1977		No casualties	Construction damages
Floods 1985		No casualties	Construction damages
Floods 1993		No casualties	Construction damages
Land-slide 1977	Gothen-burg	9 people killed	67 buildings destroyed
Storms 1984		No casualties	Construction damages

Damages caused by natural disasters

Year	Number		Compensation paid by insurance companies (USD)	
	Storm, hail	Other	Storm, hail	Other
1992	3 495	658	3.1 million USD	1.6 million USD

5. National socio-economic conditions

*Population	8.692.013 (Dec-92)
*Gross-National Product (GNP)	189,42 billion USD (-89)

*Per-Capita Income 22 303 USD (-89)

6. Availability of assistance to other countries in the field of natural disaster reduction

THE SWEDISH RESCUE SERVICES BOARD:

Training
Fire brigade personnel from Spain have on several occasions received training in, among other things, technique and tactic in fighting wild fires.
A similar education, though of a somewhat smaller scope, has been accomplished with fire brigade personnel from Russia, Estonia, Saudi Arabia, Singapore and USA.

Co-ordination of the rescue services in the Baltic States
The Baltic States after their indepence have expressed a wish to make their rescue services more effective. Sweden is helping Estonia, Latvia and Lithuania to create a national body corresponding to the Swedish Rescue Services Board.

SRV Rescue Team
The Swedish Rescue Services Board (SRV) has created a so called Rescue Team for operations at short notice abroad. The rescue force can be organized and equipped according to the type of rescue operation foreseen, for exampel earthquake, flood, wild fire or chemical accident. The rescue force consists of 5 to 100 men, depending on the scale of the emergency and can leave the country 10-12 hours after a governmental decision.

Emergency planning abroad
Deliberations on Swedish participation in setting up national emergency plans are under way.

Wild fire mitigation in the Baltic States
During July 1992 large areas of Latvia were hit by wild fires. To help in the mitigation Sweden sent an expert team of 26 persons and material. The Swedish team above all helped out with command and co-ordination.

Risk analysis
In order to help the municipalities the Rescue Services Board issued a handbook in risk analyses within the rescue services. The handbook is useful in the preventive work against natural disasters, as well as other types of emergencies.
The handbook has been translated into English and published by UNEP, thereby becoming available also internationally. Translations into French and Spanish are under way.

THE ROYAL INSTITUTE OF TECHNOLOGY

The Royal Institute of Technology (KTH) is at present engaged in two programmes related to natural disaster reduction in the developing countries.

CEPREDENAC
The first programme is the Natural Disaster Prevention in Central

America (CEPREDENAC), which is administered and co-ordinated by the Centre for International Technical and Educational Co-operation (CITEC) at KTH, and supported mainly by the Swedish International Development Authority (SIDA) and Norway.

SuWaR
The second programme is called " Sustainable Use of Water Resources (SuWaR)" and is also supported by teh Swedish International Development Authority (SIDA). The programme does not directly address disaster reduction problems, but has a close relationship with water-related disasters in Southern Africa, South Asia and Nicaragua. Experience from the programme could in the future be utilized for a more pronounced regional water-related disaster reduction programme.

THE SWEDISH METEOROLOGICAL AND HYDROLOGICAL INSTITUTE (SMHI)

Hydrology
The Swedish Meteorological and Hydrological Institute (SMHI) is running a project in the field of hydrology in several places in southern America. These projects are financed primarily by the Agency for International Technical and Economic Co-operation (BITS).
SMHI is also engaged in a BITS-financed project in Zimbabwe, which aims at adapting a hydological model to the Manyame-river. This will enable flooding prognoses, with the purpose of using the water as effectively as possible during drought periods.

Meteorology - forecasting/warning systems
As a part of it's regular activities SMHI also has embarked on a long-term project with the aim of supporting the Baltic States in the build-up of their hydrometeorologcial institutes. Among the duties of a hydrometeorological institute is the issuing of warnings when extreme events are imminent.

In this area the international co-operation is very important and SMHI actively work within the World Meteorological Organization (WMO).

DEPARTMENT OF GEOPHYSICS AND FOA

Seismology - forecasting/warning systems
A project which has attracted a lot of publicity abroad deals with seismology and the possibilites of early warning. It is a joint nordic project. The Swedish institution represented in the project is the Department of Geophysics at the University of Uppsala.
The idea behind the technique is to register movements in the ground within the magnitude 0-1 on the Richter-scale, with the help of a seismographic network. These minor earth movements could eventually be used in predicting a major earthquake.

The National Defence Research Establishment (FOA) is also active in the field of seismology and is operating 2 array stations in Sweden.

Seismology - Training
The Department of Geophysics provides training on academic level in all branches of seimology. Several programs in Natural Disaster Prevention are going on for Central America (CEPREDENAC), East Africa and other regions.

THE SWEDISH GEOTECHNICAL INSTITUTE (SGI)

The Swedish Geotechnical Institute (SGI) has been working with landslide problems since its start in 1944. Safety questions in planning and the use of slide prevention techniques in construction are central duties for the institute. SGI is working in all phases of the municipality planning and building process regarding landslide problems with
* landslide risk mapping
* stability investigation and analyses
* design of stabilization work
* landslide warning systems

Advice to municipality planners and engineers and short term courses to different categories are also part of the SGI work in landslide risk management.

International exchange of research foundings is recognised by the institute as having vital importance. Close relations are therefore being established with research institutes and universities in Europe, North America and Japan.

THE GEOLOGICAL SURVEY OF SWEDEN

The Geological Survey of Sweden has established a co-operation within the area of environmental-geological questions with the Baltic States and this co-operation will be further developed during the decade.

SWEDESURVEY

Swedesurvey Ltd is responsible for the marketing and co-ordination of the activities abroad of the Central Board of Real Estate Data and the Central Office of land Survey.
In a catastrophy new maps are often needed, often in digital version, in order to allow quick interpretations and processing. Swedesurvey can provide this type of material at short notice.
When it is necessary to clarify present use of land, rights to land or a valuation of land or buildings Swedesurvey can provide experts with international experience. By combining real estate information with landscape information the analyses and planning of assignments can be made more effective. Valuation might be needed in order to lay down the scope of damage as well as the scope of compensation in case the owners can not return to the area.

7. International assistance required for natural disaster reduction

No direct assistance is required. However, an exchange of research results and methods and a co-operation in research programs is always of importance.

SECTION B: STRATEGIES AND ACTIVITIES

1.Steps towards achieving the 3 main Decade targets

(a) Geological conditions for risks of landslides are present in some 200 municipalities. Overview mapping of risks for landslides has been carried out/ begun in some 40 municipalities.

The Swedish Geotechnical Institute (SGI) has developed a flexible computerised monitoring system for landslides. The application of the system is primarily to observe changes in soil parameters such as pore water pressure, soil pressure, horizontal and vertical movements and tilting, which can indicate increased danger of landslides. The monitoring system has opened new views to estimate risk for landslides and give data of high quality for modern analysis programs in soil mechanics.

Flooding is to a certain extent predictable, both in time and space. Methods exist for prognoses as well as for illustrating the risks of flooding in form of maps. The latter possibility has up till now only been marginally used.
Sweden has a relative great amount of water power. The major part of the production capacity is in the northern part of the country. Because of unusually high rainfall during the autumn of 1985, a landslide occured in a small power station dam which led to the break of the dam. The dam break caused much material devastation, but fortunately nobody was injured.
This lead to an alteration in the assumption regarding the flow, on which the dimensioning of the dams are based. The former assumption meant a dimensioning based on a 1 000-year flow. The security has now been raised to a 10 000-year flow.
This means that many of the power station dams cannot withstand the dimensioned flow and a big rebuilding program, which certainly will go on for many decades, will start.

The installation of warning systems has started in connection to the power station dams. The warning system will warn people who live or stay down-stream of the dam. The system will also warn the staff in operation beforehand against for instance increased leakage or movements in the dam body.

The planning and preparedness of the rescue services must be strengthened.

Accidents due to hard winds or lightning make up a relatively large part of the total number of natural disasters. Methods to protect lives and property exist, but are not used to such an extent that might be wished.
In recent years attention has been drawn to the problem of coastal erosion. Even if the phenomenon in itself is slow and cannot be described as an accident, it can cause sudden events such as landslides. Several suggestions have been made on how to reduce the effect of erosion technically and work has begun along the southern coast line.

(b) As far as landslides are concerned the Swedish Rescue Services Board continues to work on several front-lines: within the Swedish Commission on Slope Stability, through key mapping and through the financing of preventive measures against landslides. Together with the National Board of Housing, Building and Planning the Swedish Rescue Services Board propagate the use of the information obtained from key mapping in physical planning, as well as working on giving the risks of flooding due attention in physical planning at the regional and local level.
The Board, moreover, supports preventive measures as well as measures aiming at limiting the damage caused by landslides and other natural hazard in the municipalities.
The follow-up and evaluation of projects carried out up till now will be intensified.

The programs aiming at improving the knowledge concerning risks among the public and it's ability to prevent and limit the damage caused by natural disasters will be continued and improved

The Swedish insurance companies together form a Commission on Natural Disasters where the consequences of natural disasters regularely are discussed.
At present several major insurance companies are investigating the consequences of major brakes from an insurance perspective.
Generally, damages on buildings and personal property caused by flooding are compensated by the insurance companies if you have taken out a consumer insurance policy. Other terms apply to company insurance policies.

(c) Flood prognoses are constantly being developed by the Swedish Meteorological and Hydrological Institute.
With the help of the Swedish Rescue Services Board the system for issuing of warning for flooding is being developed as well as the relation to the needs of the rescue services.

The entire population shall receive warning messages, when necessary, through radio and televison. In areas with dangerous activities (for instance nuclear plants or chemical industries) warning shall be issued with the help of outdoor sirens as well.

Preparations shall be made for evacuation, as a preventive measure. The planning shall be co-ordinated throughout the country following the common rules agreed upon by the different authorities responsible for evacuation.

2. Present national plan for natural disaster reduction

(a) Time span covered
1994-1999

(b) Agencies, institutions and organizations involved:
The Swedish Rescue Services Board in co-operation with other governmental agencies as well as academic and research institutions

(c) Implementing agencies
Swedish Rescue Services Board

(d) Funds available for implementation
About 12 million USD

3. Legislation introduced and enacted in relation to natural disaster reduction

The Planning-and Building Act (PBL) is a very comprehensive legislation. It regulates the municipalities planning of housing and other uses of the land.

When the Planning-and Building Act is applied one should also take into consideration the general rules of the Natural Resources Act. The Planning-and Building Act forced all municipalities to endorce a key plan before the 1st of July 1990, which shows how the municipality plan to use it's land.
This key map is supposed to form the basis for the detailed plan and decisions concerning different areas, which are legally binding as opposed to the key plan. The municipality has to follow these detailed plans when they decide on building permits, among other things.

The county administrative board checks that the municipalities planning is in accordance with existing rules and what effects the ruling of one municipality has on the neighbouring municipalities.

The following paragraphs in the Planning-and Building Act are concerned with the issue of health and safety.
Buildings should be located on land suitable for the purpose considering:
1. the health of the residents and others
2. ground and water conditions
3 the possibilites to provide communications, water distribution and sewage system and other forms of public service
4 the possibilities to prevent water- and air pollution and too high noise levels

The general overview of the planning and building practices in Sweden is entrusted to the National Board of Planning.

The Natural Resources Act regulates the economizing on land and water in order to secure sustainability. It is supposed to be used together with other regulations, for instance the Planning-and Building Act. It stipulates how different types of land and water areas can be best used and how certain areas of national interest, for instance certain coastal zones, rivers and river stretches, can be protected.

In order to prevent fire the opinion of the Head of Rescue Service in the municipality shall be taken into account when planning large scale timber felling or peat digging.
During the forest fire season the local Board of the municipality may decide on a general prohibition on lighting fires if there is a high fire-risk (fire hazard 4-5).

4. Disaster mitigation activities completed or underway:

Systems for observing, forecasting and warning:

Hydrological modelling of extreme floods in Sweden.
Status: Completed. Publication: Hydrological modelling of extreme floods by Joakim Harlin, The Swedish Meteorological and Hydrological Institute (SMHI), RH Report No 3, March 1992.
Participating institutions: SMHI, the Swedish river regulation enterprises, the Royal Institute of Technology in Stockholm
Costs: Approx. 100 000 USD
Sources: River regulation enterprises, SMHI

Land-use and risk management
Title: Floods in Sweden - Trends and Occurence
Status: Completed
Participating institutions: Mainly the Swedish Meteorological and Hydrological Institute
Costs: About 50 000 USD
Sources: The Swedish applied research program for dam safety and floods during extreme hydrological conditions

Weather forecasting
Title: High Resolution Limited Area Model (HIRLAM). Development of an operational weather forecasting model. Application in this context: Warning for hazardous weather
Status: Project period: April 1992 - October 1996
Participating institutes: Swedish Meteorological and Hydrological Institute in cooperation with the weather services in Finland, Denmark, Norway, Iceland, the Neatherlands, Ireland, France and Spain

Sources: Participating weather services, Nordic Council of Ministers, CEC
Implementing agencies: Participating weather services

Earthquakes
In Sweden a national network is run by the Uppsala University. The network is analog and plans exist to build up a digital network for research and continious monitoring of the Swedish and global seismicity to be used in hazard assessments and other studies.

The National Defence Research Establishment (FOA) runs 2 array stations in Sweden. These represent an important part of a global verifications system for the Comprehensive Test Ban Treaty.

Landslides
In order to prevent landslides the Swedish Rescue Services Board has paid for key maps in fourteen municipalities during 1992/93. The maps provide information about which areas need to be studied further concerning stability.

13 different objects in twelve municipalities received support for preventive measures against landslides and other natural disasters in 1993. The Swedish government in December -93 decided to invest 3 million USD in the forthcoming year on preventive measures in 13 municipalities against landslides and other natural hazards.
The decision is based on a risk evalutation based on material provided by the Swedish Rescue Services Board in co-operation with

the Swedish Geotechnical Institute and the Swedish Meteorological and Hydrological Institute.
The same amount - 3 million USD - has been invested every year since 1987 as a part of the preventive program against slides.

The Swedish Commission on Slope Stability - a commission of the Royal Academy of Engineering Sciences - was founded in 1988 for the purpose of handling research, development and information concerning land slides. The main task of the Commission is to initiate and coordinate research and give information about slope stability and land slides, as well as methods for preventive measures. The work of the Commission is financed by ressearch grants and fees of the members and will continue up to 1996.

The Commission on Slope Stability will work in the purpose of the IDNDR declaration.

The work of the Commission will concentrate on the following priority areas:
* Information and education to different parties concerned
* Slope behaviour (Stresses and strains in slopes and methods for analyses and calculations)
* Reinforcement measures (slope stability, stabilization methods, environmental aspects)

The most important working tasks of the Commission are:
* to formulate Research and Development (R & D) programs and give priority to R & D efforts
* to initiate R & D or through the working groups accomplish R & D tasks
* to make sure that there are enough economical and personal resources to carry out the R & D programs
* to follow up and evaluate R & D in the various areas
* to make available R & D result and inform about them
* to ensure that the R & D results are put to practical use, i.e. supervision, advice and guidelines
* to disseminate information about slope stability to different appropriate National and Local authorities and other parties
* to act as a discussion forum between different parties concerning stability matters

Preparedness and community awareness
In order to change behaviour you really need to start with the very young, who have not already established habits of their own.

The Board is therefore working with the prevention of fire on local, regional and national level. The Board, together with the non-governmental organization SBF, put together a material to be used in the compulsory school- one package aimed at children in the second grade (8 year olds), the second aimed at children in the fifth grade (11 year olds). In the autumn of 1992 the material was ready for distribution and up till now about 40 % of the 8-and 11 years old in Sweden have been given lectures on civil protection.
What the children are being taught:
The material for the 8 year olds

- things you should not play with - chemicals, matches
- what to do if a fire breaks out - get out quick, stay below the smoke, close the doors thus smothering the fire, call 90 000/112
- if a fire breaks out at school - how to evacuate, where to fins the fire extinguishing equipment
- if a fire breaks out in your home - how to get out
- important signs you need to know - emergency exit and others
- the rescue service - how it works

The material for the 11 year olds:
- the same subjects as for the 8 year olds, but more elaborate
- alarm signals - in Sweden different types of signals are used to warn the citizens. Learn how to recognize the signals and what to do if any of these signals are sounded
- risks in the area where you live

There is also another type of school material, aiming at young people in the 8th grade (15 years old). This material deals with preparedness against all types of hazards. Among other things the students are asked to make an inventory of the risks in the municipality where they live and ask their politicians and civil servants what they have done or are planning to do in order to minimize these risks.

Everybody needs to know what to do in case of a disaster/accident. The Board together with several non-governmental organizations including the Red Cross, is educating the population during evening classes.
A special project is being run in sparsely-populated areas. People who live there must take on the responsibility of their own safety and must be able to help themselves, awaiting the arrival of the rescue service from the nearest municipality.

5. Plans to fully achieve Decade targets by the end of 1999

In it's program planning for the period of 1994-1999 the Swedish Rescue Services Board has decided, as an overall goal nationally, that:
- Damages caused by natural disasters shall be limited as much as possible.
- The breaking of dams shall be prevented

In order to obtain this:

- Areas at risk for natural disasters such as landslide and flooding should be included in the physical planning at different levels. The mapping of such areas should be carried out in municipalities with high risk of such disasters.

- The possibilities to predict natural disasters, for instance floodings, should be considered in connection with planning and carrying out of rescue operations.

- Down stream larger dams, warning systems shall be installed giving information about the condition of the dam as well as the safety of the inhabitants in the area.

- Measures taken against natural disasters with the help of state

financing shall be well motivated and prepared. The effects of measures carried out shall be followed-up systematically.

SECTION C: INTERACTIONS

1. Publications on IDNDR-related subjects:

The Swedish Commission on Slope Stability has issued a lot of publications in Swedish dealing with:

* Measurements of Stresses and Strains in Slopes.
* Stresses and Strains in Slopes, Case records.
* Resonsibility and claim for compensation at landslides.
* Landslides in Sweden. The report presents a number of occurred slides during the last fifty years.
* Measurements of horizontal stresses and horizontal movements.
* Comparison between different slope stability calculation programs.
* Safety first of all. A fact sheet about landslides and questions relating to landslides. The fact sheet is intended for residents, house owners, neighbourhood representatives, officials and consultants.
* The Swedish Emergency Services action check list. The check list is to be followed when a landslide has occurred or there is imminent danger of a landslide.
* Landslide questions in the planning and building process.
* A fact sheet about stability investigations. It is fashioned into a form. After a stability investigation is completed the form shall be filled in.
* Video film: Landslides - safety first of all. The video film is part of the Commission's efforts to give adequate information and knowledge to every person who are concerned and interested in these issues.

2. IDNDR meetings and conferences

It is vital to create a risk awareness in the municipalities. The Board together with the regional authorities in six regions therefor run a special project, aiming at making politicians, employees working for the municipalities and civilians aware of the risks in their municipality and to promote a discussion of possible actions to reduce these risks.

Every year a national campaign, run by the local rescue services and financed by the Swedish Rescue Services Board, tries to enhance risk awareness and preparedness. The 1993 theme was evacuation.

Together with other authorities (the Central Board of Real Estate Data, the Central Office of the Land Survey, the National Maritime Administration, the Geological Survey of Sweden and the National Board of Civil Emergency Preparedness) the Swedish Rescue Services Board is organizing a risk planning day open to all politicians and employees within municipalities and county administrative boards responsible for environmental issues, rescue services, social- and emergency planning.

This will take place in the beginning of 1994 and will illustrate how you can reduce damages to life, property and environment before, during and after an accident with the help of landscape- and real estate information.

The way in which the different authorities co-operate in order to raise awareness and minimize the damages, as illustrated in the example above, is typical of the "Swedish administrative model". Depending on the problem which needs to be solved groups, made up of the authorities, representatives of the private sector and of non-governmental organizations, are formed.
The advantages of this model according to our experiences are among other things a greater involvment and a swift implementation. A horizontal co-operation between authorities and scientific institutions, internally as well as between countries in an affected region, is also something we try to promote when working outside Sweden.

3. Current or planned partnerships and co-operation related to IDNDR with other countries
A request has come from the Finnish IDNDR-committee to put together a Nordic report to the IDNDR-conference in Yokohama. Sweden had to turn the suggestion down, because of the short time available.
There is however a tradition among the Nordic countries to co-operate in activities aimed at helping countries outside the region and this will surely be manifested throughout the remainder of the decade.

SECTION D: EVALUATION

1.Overall evaluation of national disaster mitigation programmes

The Swedish activities aimed at reducing the effects of natural disasters probably would have been of the same magnitude even if this decade had not been declared the international decade of natural disaster reduction. The activities began a long time ago and will continue after the end of the decade for as long as there is a need. From a scientific point of view, however, the proclamation of the decade has enhanced the possibilities for Swedish Research Institutions to test programs and models outside Sweden and has directed money towards the goal of global natural disaster reduction to a greater extent than would otherwise probably have been the case.

2. Review of the IDNDR

The main focus of IDNDR should be on regional, action-oriented projects. Internationally Sweden will continue to support programmes that have a demonstrably beneficial effect on recipient countries' capacity to mitigate or respond to disasters.
The projects should be oriented towards the needs of the region in question. Preferably the regions should consist of natural, geographical areas of co-operation.