3. Collection and Dissemination of Information on Natural Disasters and Disaster Reduction

3-1. Principle and Methods

3-1-1. Data Collection Principle

With the consent from the 24 countries in the Asian region, ADRC has been collecting and organizing information on the situation of natural disasters in each member country and, as well as information, knowledge and experience related to the systems, plans, and specific measures of each country for disaster reduction in order to facilitate information sharing of between member countries. ADRC has been committed to establishing the foundation for such an information network in order to promote establishment of national disaster reduction framework in each member country, and multinational cooperation for disaster reduction in Asia.

In addition, ADRC has collected information from related materials available, the disaster reduction officers of various countries and other related organizations, and constructed an up-to-date database of natural disasters and disaster reduction specialist resources, to help disseminate the information. Furthermore, through collaboration with visiting foreign researchers, the Asian Unit of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), and OCHA ReliefWeb Office in Kobe, ADRC has also obtained quick access to more detailed and specific information, which is incorporated in information ADRC disseminates

ADRC will continue collecting and releasing detailed information on the following through the Internet and other media:

① Disaster management systems (legal frameworks, organizations, basic plans, and disaster management manuals, etc.)
② Actual cases of disaster countermeasures (taken by the member countries in the past)
③ Information on natural disasters (descriptions of natural disasters such as earthquakes, floods, cyclones, etc , and resulting damages)
④ Human resources information (disaster reduction administrators, academic experts, international organizations, private companies, NGO members, etc.)

3-1-2. Means of Data Collection on Member Countries

In fiscal 2003, as in the previous year, ADRC collected disaster reduction related information on member counties through the following methods:

1) **Requests to member countries for information**

ADRC has made efforts to gain the understanding of each member country on the purposes of establishing the ADRC and the need for multinational disaster reduction cooperation Upon the request from ADRC, member countries have been providing natural disaster information, as well as information on actual disaster management measures and disaster reduction systems

2) **ADRC International Meeting 2004 (Refer to Chapter 2)**

At the Fifth ADRC International Meeting (February 4 to 6, 2004), member countries, and advisor countries, and countries and organizations participating as observers provided natural disaster information including country reports, and other materials on actual cases of disaster management, and disaster reduction systems. They also voiced their requests concerning the activities of ADRC.

The Sixth ADRC International Meeting attracted attendance of many disaster-related international organizations, which also participated in the Third ISDR Asian Meeting co-hosted by the ISDR Secretariat, Govenents of Cambodia and Japan at the same location. Thus, the Sixth ADRC International Meeting provided a meaningful opportunity for re-confirming the need of building an international cooperation system for more diverse

collaboration and more efficient disaster information sharing

3) Use of WWW (World Wide Web)

(1) Disaster reduction information of each member country

As it did in the last fiscal year, ADRC is collecting information on the disaster reduction systems of member countries from WWW, in addition to related information provided by administrators in charge at international organizations and countries.

In the future, it will be important to keep a close eye on disaster reduction information provided by member countries, and provide technical and other forms of support to member countries for constructing disaster information databases for an information network that facilitates active involvement of member countries in information dissemination.

(2) Disaster reduction information provided by academic research institutions and international organizations

There are other international organizations and research institutions engaged in collecting and providing disaster reduction information from various perspectives. The Internet has expanded over recent years, gradually providing an infrastructure for access to such information.

However, such information is circulated via different and independent channels. As a result, it is not always easy to access the exact information needed. To resolve this problem and promote disaster-related information sharing, ADRC has proposed use of common disaster IDs The disaster database (EM-DAT) run by CRED of Louvain Catholic University in Belgium provides access to statistical data of disasters all over the world via the Internet. While the EM-DAT serves as a statistical database, OCHA provides information on natural disasters and reliable information on disaster countermeasures and management at its "ReliefWeb" site on the Internet in order to support humanitarian activities during disasters. Use of common disaster IDs for the disaster reduction information will facilitate easy access to information of both EM-DAT and OCHA. ADRC intends to further promote the GLIDE (GLobal unique disaster IDEntifier number) ID project launched in 2001 in order to facilitate effective integration of information disseminated by many disaster management-related organizations on the same disasters.

3-2. Information on Disaster Management Systems

3-2-1. Scope of Information

Major components of a disaster management system include a legal system that prescribes the due process to be followed by the government, organizations that implements actual measures under the government, and a basic plan for ensuring the establishment of the disaster management system. In addition, disaster management manuals, hazard maps, disaster management trainings and seminars, and disaster reduction education programs are also included.

1) Legal frameworks

Not all countries have national level laws comparable to Japan's "The Disaster Countermeasures Basic Act." In some countries, government decrees and rules of specified organizations provide for disaster management systems. The backgrounds and processes of formulating laws and regulation vary from country to country, and there is no single "Best way" for all countries Still, shared information on disaster legislation of different countries will provide a useful reference to countries that are making efforts to establish similar legal frameworks or improve their current frameworks

2) Organizations

Similarly to the case of legal frameworks, disaster reduction agencies vary from country to country In addition, these organizations are often restructured while the fundamental legal framework for disaster reduction remains unchanged. Differences among

countries in natural environments and socio-cultural background do not reduce the significance of studying organizational systems of other countries, in that the purpose "disaster reduction" is common to all countries. Furthermore, knowledge of the roles and command chains of organizations of other countries is important to facilitate international collaboration for disaster reduction.

3) **Basic plans**

Many of the member countries are yet to strategically strengthen their disaster preparedness according to comprehensive disaster reduction plans. Open and shared information on disaster reduction plans of other countries will provide good reference materials for countries planning to formulate or revise their disaster reduction plans. Feedback and reviews that these countries would give will be useful in promoting multinational disaster reduction collaboration.

4) **Disaster manuals**

It is considered that most disaster manuals or hazard maps are compiled based on natural disasters experienced by each country or region, or on the type of natural disaster specific to that country or region. However, such manuals and hazard maps make it difficult for countries and regions having suffered same kinds of disasters to share experiences and information on countermeasures, and might cause inconveniences in the actual implementation of international, regional-national, or inter-regional cooperation. Therefore, as it was in the previous fiscal year, ADRC is committed to collecting information to enable the sharing of these existing disaster manuals and hazard maps Waves of urbanization and globalization continue increasing the pace of changes, and ADRC will continue its effort for the Asian region to share valuable experiences, knowledge, and views of disaster management measures that have been accumulated in different countries and regions.

3-2-2. Levels of Information Sources

It is important to collect information not only at the national government level but also at local government (city, town and village) and community levels. This is because that the first to cope with a disaster is the individuals, and then local communities and municipal governments (cities, towns or villages). Central governments or the international society moves only when the disaster exceeds the capabilities of local governments. Legal and organizational frameworks established by a central government alone do not automatically improve actual disaster reduction capabilities and preparedness down to municipal and grassroot levels. To build a disaster-resistant society, cross-organizational cooperation is indispensable. Sharing of information at all levels is the first step to this goal.

3-2-3. Information Gathering Methods

In 2003, as explained in 3-1-2, ADRC continued its effort to gather information on the disaster reduction systems of member countries through requests to them, field surveys, and international conferences, and by its own unique methods using the Internet.

Table.3-2-3-1 lists the reports provided from counterparts of member countries. All these reports are available on the ADRC website. Over recent years, disaster reduction organizations of many countries have been actively promoting information dissemination over the Internet. Therefore, the ADRC website has links to some of these websites, when it is more efficient to jump to them for the latest information than view the reports on the ADRC website.

Table 3-2-3-1 List of reports from ADRC member countries

No.	Country	Year prepared
1	Armenia	2001, 2002, 2003
2	Bangladesh	1998, 1999, 2001, 2003
3	Cambodia	1998, 1999, 2002
4	China	1998, 1999
5	India	1998, 1999, 2002
6	Indonesia	1998, 1999, 2002, 2003
7	Japan	1998, 1999, 2002
8	Kazakhstan	1998, 1999, 2002
9	Korea	1998, 1999, 2001, 2002
10	Kyrgyzstan	Now Preparing
11	Laos	1998, 1999
12	Malaysia	1998, 1999, 2003
13	Mongolia	1998, 1999, 2002
14	Myanmar	2002
15	Nepal	1998, 1999
16	Papua New Guinea	1998, 1999
17	The Philippines	1998, 1999, 2002, 2003
18	Russia	1998, 1999
19	Singapore	1998, 1999, 2001, 2002, 2003
20	Sri Lanka	1998, 1999
21	Tajikistan	1998, 1999, 2003
22	Thailand	1998, 1999, 2003
23	Uzbekistan	1998, 1999
24	Vietnam	1998, 1999

3-2-4. Remaining Tasks

As for future tasks, ADRC will further reinforce and expand its database, analyze collected information, and identify the needs of the member countries based on such analyses in order to promote multi-national disaster reduction cooperation.

1) **Reinforcement and expansion of the disaster reduction database**

ADRC constructed a database on its homepage to give free access to disaster reduction system information it collects for member countries to share. It enables countries and regions to refer to actual examples from other countries to establish and improve their own national or regional disaster reduction systems. ADRC will continue updating and enhancing the contents of its disaster reduction database in cooperation with member countries to make the database more accessible and user-friendly.

2) **Analysis of information and dealing with the needs of countries**

Information becomes useful only when referred to for analyses Analysis of collected information is beginning to help clarify the specific circumstances and needs of various countries. Some countries already have national level disaster reduction systems, while others are currently preparing to establish disaster reduction systems at the initiative of the central governments. It is considered that the former countries need to add improvements to enhance and reinforce their existing systems, while the latter group should give priority to the establishment of disaster reduction systems as part of intra-region cooperation.

In order to reduce Asia's vulnerability to natural disasters, it is essential for countries in the region to consider and include disaster reduction measures in their long-term basic national plans. The prerequisite for this to happen is that the central government as well as citizenry has a higher disaster reduction awareness. For a society to give equal weight to post-disaster emergency assistance and to disaster preventive preparations, it is always necessary for lawmakers, policy makers and planners to properly include and incorporate disaster reduction issues into the basic national and regional plans.

3) **Promotion of cooperation**

As agreed at the Sixth ADRC International Meeting (Feb. 4 to 5, 2004, Siem Reap), it is important to hold regular meetings of disaster reduction administrators and specialists from member countries for exchange of the latest information on disaster reduction systems and disaster management measures. It is also important for ADRC to continue making full use of its visiting researcher program launched in July 1999 so that researchers from the member countries working as its staff will help to promote active personnel and information exchanges in the Asian region In addition, to reduce damages from natural disasters in Asia, there is mounting expectation that ADRC should serve as a facilitator in formation of a network human, technological, and physical resources in Japan and the other Asian countries for further promotion of exchanges in the region

3-3. Construction of Natural Disaster Databases

One of the factors that are very important in the establishment of effective counter-measures for future natural disasters is the information on previous disasters, including what measures were taken for what scale of natural disasters, how effective or ineffective they were, and what lessons were learned from the experiences A comprehensive database of natural disasters that have occurred in this century in Asia will provide a valuable asset in the next century.

At present, several organizations have their own statistical databases on natural disasters that have occurred in this century. Natcat, Munich Reinsurer, has accumulated information on more than 15,000 disasters dating back as far as 79 A.D, Sigma, a Swiss reinsurer, has a database containing information on more than 7,000 disasters which have occurred since 1970, and EM-DAT of CRED (Centre for Research on the Epidemiology of Disasters, Universite Catholique de Louvain) in Belgium has information on more than 12,000 disasters dating back to 1900. In addition, disaster information is disseminated over the Internet by various organizations, including UN OCHA that provides Situation Reports on major disasters experienced after 1980.

At the ADRC International Meeting (annual meeting of member counties) in December 1999, ADRC stressed the importance of making good use of these existing databases, as well as the importance of constructing a comprehensive database of natural disasters in the 20th century, which is linked up with the existing databases. To promote such information networking globally, ADRC became a member of GDIN (Global Disaster Information Network) in April 2000, and proposed the use of a global disaster ID system at the GDIN conference, Canberra, in March 2001. The disaster IDs proposed by ADRC was launched as a pilot project in 2001. Since 2002, ADRC has been encouraging various activities for more effective sharing of disaster information as an Inter-Agency Task Force member of ISDR. In 2003, ADRC co-organized. a GLIDE technical meeting with UN/ISDR and ReliefWeb, the intentions of which were well received by many international organizations

3-3-1. Current Situation of Disaster Information Sharing

Many organizations collect and analyze disaster information relevant only to their own priority themes, and provide some of the results through media including the Internet. Many of these organizations link their websites to relevant organizations to share information.

Among such organizations, UN OCHA has already started to provide highly reliable disaster information. UN OCHA has set up ReliefWeb on the Internet to provide disaster information collected from all over the world. ReliefWeb contains detailed Situation Reports and other references on disasters experienced after 1980. These resources are available on document basis. Thus, the site allows access to the synopses of disasters that have occurred during the past 20 years, and of countermeasures taken in response.

UN OCHA opened its Kobe Office in August 2001. and has been providing disaster information on a 24/7 basis from three cities. Kobe, Geneva and New York.

CRED in Brussels, Belgium, provides statistic data mainly of natural and technological disasters that have occurred with more than 10 fatalities since 1900 over the Internet.

In addition, LaRED based in Latin America collects and provides information on small-to medium-scale natural disasters that are neither included in ReliefWeb nor CRED

In addition to the organizations above, universities and institutes around the world have information on disasters that have occurred in their respective areas and information related to the field of interest, and provide some of their data over the Internet.

As for some disasters in past. typically floods or droughts. however, it is often difficult to determine the exact date of the occurrence. Recorded dates of disasters may vary depending on databases It also frequently is the case that a disaster is classified and named differently from source to source. These factors make it difficult to identify one

disaster record available from one source with those from another, especially when the disaster happened in the distant past.

As for disasters that have occurred in Japan, comprehensive detailed references are available including the "Chronological Scientific Tables" and "Meteorological Yearbook." A list of major disasters in Japan registered on the "Disaster Prevention White Paper" is available for download on the Internet. The Disaster Reduction and Human Renovation Institution of Hyogo Prefecture launched a comprehensive disaster database using the GLIDE system, a global disaster ID system to be explained in Section 3-3-3, for ease of information sharing.

3-3-2. Asia Natural Disaster Data Book in the 20th Century

Natural disasters can have serious impact on social life in general and in particular, economic development. As revealed by the statistics over the past 100 years, Asia is more prone to natural disasters than any other region of the world, and accounts for more than 90% of the world's entire affected population and 50% of both the world's total death toll and economic losses. Therefore, it is very important to analyze individual disaster events in the past while examining their general tendencies over years from the perspective of development mechanism.

Based on its agreement with Center for Research on the Epidemiology of Disasters (CRED), Catholic University of Louvain, ADRC has been analyzing the data of EM-DAT of CRED.

In July 2000, ADRC published the "Asia Natural Disaster Data Book in the 20th Century," which incorporates the member country data accumulated on EM-DAT into tables, and diverse statistics and analyses. In August 2002, its revised edition, "Asia Natural Disaster Data book in the 20th Century Vol.2," was also published.

In addition, ADRC published a report titled "Natural Disasters Data Book 2002" in March 2003. Through these data books, ADRC provides helpful information to policy-makers, academicians, as well as grassroot-level activists involved in community disaster prevention activities.

3-3-3. Proposal by the Asian Disaster Reduction Center (GLIDE Project)

1) **Disaster information sharing based on GLobal unique disaster IDEntifier (GLIDE) number**

There are many organizations that design and develop their own disaster databases for free access over the Internet. When a disaster occurs, information is distributed over the Internet not only by organizations in the affected country but also by organizations and mass media in other countries. When a disaster occurs in any part of the world, ADRC collects information by searching the websites of relevant organizations and mass media all over the world, or by sending e-mail to the contact person in the affected area. The "ADRC Latest Disaster Information" page on the website is the results of ADRC's efforts in information collection.

The problems with the conventional information collection include:
(1) It is necessary to search the Internet for websites of relevant individual organizations every time a disaster occurs.
(2) There is no standardized naming protocol for disasters. With different organization naming same disasters differently, even search engine such as Google or Yahoo

sometimes return no hits.

(3) Website links may be lost when the structure of the database or homepage of an organization is changed.

The GLobal unique disaster IDEntifier (GLIDE) numbersystem will be a solution to these problems. The GLIDE system will significantly improve the efficiency of database search and Web search for information on past and on-going disasters.

At the Global Disaster Information Network (GDIN) Conference held in Canberra, Australia in March 2001, ADRC proposed to develop a standardized code system for managing information on disasters around the world. This proposal was accepted and launched as a pilot project.

In 2003, ADRC and OCHA ReliefWeb jointly developed, with technical assistance from LaRED, a system for issuing GLIDE numbers to disasters immediately after they occur. Moreover, ADRC, jointly with CRED, IRI/Columbia University, USAID/OFDA, WMO, IFRC, UNDP, and the ISDR Secretariat, discussed how to improve the format of the GLIDE number, as well as strategies for the promotion of the GLIDE system.

The GLIDE number format was revised in 2003, and GLIDE numbers are now issued in the following format.

AA-BBBB-CCCCC-DDD-EEE

AA: Disaster classification (Code in the table is for temporary use. WMO will submit a revised proposal)

Drought	DR
Earthquake	EQ
Epidemic	EP
Extreme Temperature	ET
Insect Infestation	IN
Flood	FL
Slide	SL
Volcano	VO
Wave / Surge	WV
Wild Fire	WF
Wild Storm	ST
Complex Emergency	CE
Technological	AC

BBBB: Year of occurrence (4-digit numeric figure)

CCCC: Serial number by year

DDD: Country code (ISO code. e.g., JPN for Japan)

EEE: Region code (e.g., 013 for Tokyo)

The region code at the end was added for the convenience of the user countries in organizing their national databases. This part is not included in GLIDE numbers actually circulated.

The pilot phase of the GLIDE system started in January 2002. The GLIDE generation and notification procedure is as follows:

(1) Upon the occurrence of a disaster, ReliefWeb generates a new GLIDE number and notifies CRED via e-mail.

(2) For disasters other than ones generated in 1 above, CRED generates GLIDE numbers within one week of the occurrence.

(3) CRED informs ADRC and other related organizations of the GLIDE numbers generated in 1 and 2 above on a weekly basis via e-mail.

(4) ADRC dispatches the GLIDE numbers to individual organizations through the "ADRC Highlights" communication channel.

This procedure is temporary is and to be replaced by a system currently under construction at GLIDEnumber.net for full automation of the entire process from GLIDE number issuance to notification (due in May 2004).

A new GLIDE number is entered into the database currently in operation in the following three steps:
(1) Add a GLIDE column to the database table on the screen.
(2) Refer to data on past disasters at http://www.cred.be/emdat/disdat1.htm.
(3) Search for the name and GLIDE number of the disaster registered Enter the appropriate number into the column created in step1 above.

Then, the GLIDE number is used as the key to retrieve the necessary data from the database:
(4) Use the GLIDE number as the key to create a program for retrieving and displaying the necessary data from the database.

An organization that already allows open access to its databases has only to make minor adjustments to the existing program, and can add quick access links for visitors to jump to other sites containing relevant information. To add such a link, use the following method:
(5) Create a button that contains a URL link to a relevant organization's site and the relevant GLIDE number in it.
(6) Apply to GLIDEnumber.net for the registration of your database.

Now the organization has its database connected to other databases all over the world via the GLIDE system.

In order to further promote the use of the GLIDE system, ADRC and OCHA ReliefWeb have developed and started operating GLIDEnumber.net (http://GLIDEnumber.net/). The GLIDEnumber.net provides services and functions such as explanation of the GLIDE system, search of the latest disaster information, registration to the GLIDE mailing list, registration for GLIDE membership, and generation of new GLIDE numbers. ADRC expects GLIDEnumber.net to help a wider use of the GLIDE system among the member countries and disaster-related organizations Databases connected via the GLIDE system will provide the following advantages:
- A parameterized search function allows easy association between pieces of disaster information possessed by various organizations.
- A search engine developed with the focus placed on parameters of particular importance to user organizations allows a one-stop search and display of all necessary relevant data, eliminating the need of repeating search for data possessed separately by individual organizations (Note, however, the problem described in the following section).
- Accordingly, changes in individual organizations' database designs do not prevent the user from viewing the same data by directly referring to the GLIDE number Neither will viewers have much trouble in changing the search method.

2) Challenges in implementing the system

There are some inherent challenges in effective operation of this system:
- The basic premise for search of a past disaster using the GLIDE system is that the disaster needs to have been registered in the GLIDE database. Otherwise, the system returns no results. This means that it may take a lead time up to one week before a GLIDE number is issued to a latest disaster. In the meantime, no information on the disaster is available from the GLIDE database. Therefore, it is necessary to develop a mechanism for quicker issuance of GLIDE numbers to facilitate faster information sharing among individual organizations.
- A GLIDE member organization has to do extra preparatory works, such as

incorporation of GLIDE numbers to its own open database(s) to accept inbound access via the GLIDE system

☐ When direct search into an organization's database for content data is impossible because of the server's structure or for security reasons, an additional database will be necessary to incorporate ID codes into the organization metadata (storage location information).

☐ At present, CRED-run database (EM-DAT) is known to have no data on some disasters, in particular, those that occurred in the distant past. ADRC made inquiries to member countries for such data, and compiled and forwarded a collection of corrected records of past disasters to CRED No updates to EM-DAT, however, have yet to be made.

3) **Activities at the United Nations**

In July 2003, GLIDE Technical Meeting was held in Geneva In November, on the occasion of the 8th ISDR Task Force meeting, a meeting of the Working Group III (Risk, Vulnerability & Impact Assessment) was held. The Working Group III recommended:

(1) Use of the GLIDE system as a tool to facilitate disaster information database sharing.

(2) Development of GLIDEnumber.net website to promote the use of the GLIDE system.

(3) Development of Automatic GLIDE generator and GLIDE report for faster information sharing.

(4) Revision of the GLIDE number format.

(5) Promotion of the use of the GLIDE system for disaster databases developed at the national level.

GLIDE was highly evaluated at the Working Group sessions as a tool for information sharing.

4) **Further promotion of GLIDE**

In order to further promote disaster information sharing, it is necessary to enhance GLIDEnumber.net for easier and faster registration and search of GLIDE numbers, and to increase partners for full-scale operation of the GLIDE system.

ADRC will use the ISDR framework and host GLIDE partner conferences in order to discuss these issues in depth, to provide solutions to the tasks lying ahead, and to promote the use of the GLIDE system.

3-4. Disaster Management Exhibition

3-4-1. Support of Disaster Management Exhibition

Development of disaster-related technologies and equipment is not easy because the purposes of the applications are limited. In addition, even when a new technology or piece of equipment is developed, advertising is limited due to the small market.

However, these technologies and equipment make a significant contribution in improving the disaster management capability of an entire society Accordingly, it is important to expand the marketing by providing information on these technologies and equipment to a wider range of organizations and individuals, including local municipal bodies, private companies, NGOs and the general public.

One of the means to increase awareness is the exhibition of disaster management technologies and equipment. Such exhibitions have been held in Tokyo, Yokohama and Kobe ever since the Great Hanshin-Awaji Earthquake.

ADRC participates in the Earthquake Disaster Reduction Technology Exhibition which is sponcored by Kobe city and opens once a year at Kobe and Yokohama. ADRC continuously intends to support the Earthquake Disaster Reduction Technology Exhibition.

Table.3-4-1-1 Overview of Disaster-related Exhibitions

Place	Name	Period	Visitors	Exhibitors	Booths
Tokyo	Tokyo International Fire Prevention and Disaster Reduction Exhibition	June 4-9, 1998	214,064	260	1,380
	Disaster Rescue Fair 2000	April 20-23, 2000	51,668	70	900
Yokohama	Earthquake Disaster Reduction Technology Exhibition '02	February 14-15, 2002	5,636	125	128
	Earthquake Disaster Reduction Technology Exhibition '03	February 6-7, 2003	6,629	96	157
	Earthquake Disaster Reduction Technology Exhibition '04	February 5-6, 2004	7,539	92	110
Kobe	Earthquake Disaster Reduction Technology Exhibition '97	January 16-17, 1997	4,264	130	230
	Earthquake Disaster Reduction Technology Exhibition '98	January 13-14, 1998	3,220	115	215
	Earthquake Disaster Reduction Technology Exhibition '99	January 13-14, 1999	3 830	120	135
	Earthquake Disaster Reduction Technology Exhibition '00	January 27-28, 2000	3,479	59	81
	Earthquake Disaster Reduction Technology Exhibition '01	January 18-19, 2001	3,541	50	72
	Earthquake Disaster Reduction Technology Exhibition '02	February 14-15 2002	1,550	25	25
	Earthquake Disaster Reduction Technology Exhibition '03	January 30-31, 2003	3,336	43	48
	Earthquake Disaster Reduction Technology Exhibition '04	January 29-30, 2004	3,906	35	40

3-4-2. Closing of Virtual Internet Exhibition of Disaster Reduction Technologies

ADRC prepared a database of disaster reduction technologies and opened a virtual exhibition on January 17, 2001 so that anyone can view various technologies and equipment over the Internet

3-5. Disaster Management Internet GIS

3-5-1. Objective of Disaster Management Internet GIS

The objective of the Geographical Information System (GIS) is to make full use of spatial data (data input and output, analyses, storage, and updating) beyond the limits of conventional paper maps. The term "spatial data" consists of "geographical data" and "attribute data." Geographical data relate to distribution, locations, and configurations of topographic features (elevations, rivers, etc.), and features of human activities and social environments (railroads, roads and streets, buildings, land use, vegetation and population), while attribute data consists of attributes (name, class, numerical value, etc.) of such feature items. A GIS has various functions that help users to make decisions and to perform environmental or disaster impact assessments. Such functions includes: visualization using selective overlay of spatial data or by legends (classifiers), statistics processing using spatial analyses, extraction (buffering) of disaster-affected areas, and selection of shortest paths. Usually, to use GIS resources, dedicated hardware, software and databases are necessary. A Web-based GIS has the advantage that it can be devised to enable analysis, display and acquisition of data using the Internet without requiring the user to install special GIS software. This point is a very important in the handling of disaster information, because it helps reduce equipment investment and facilitates information sharing.

The member countries of ADRC still differ greatly in the degree of Internet availability. However, it is certain that Internet user populations will increase in these countries, along with the diffusion of faster and cheaper connection services. Moreover, the problem of unavailability of fixed-telephone lines is steadily diminishing thanks to the ongoing pervasion of the satellite Internet connection technology. Thus, Internet GIS resources can be expected to increase its importance as a disaster risk management system in an emergency.

3-5-2. Development and Improvement of "VENTEN (Vehicle through Electronic Network of disasTer gEographical informatioN)"

3-5-2-1. Background to the Development of "VENTEN"

Recent advancements in image possessing technology have greatly improved the reliability of satellite image data (in terms of accuracy and resolution), laying the groundwork for applying various data, which are extracted using remote sensing technology that eliminates spatio-temporal limitations, to disaster reduction. At present, however, the use of systems having direct applicability to disaster reduction is still very limited. One of the main reasons for this is the fact that a disproportionately large emphasis has been placed on technological breakthroughs by satellite image providers while disaster management practitioners have not been actively involved. Another reason is the technical difficulty of direct application of data extracted from satellite images to disaster reduction activities. Such data do not become usable for disaster reduction until they are analyzed in combination with natural environment data (e.g., topography and geology), and social environment data (e.g., population, buildings, and infrastructures). A yet additional and large preventive factor for the application of satellite imagery to disaster reduction is the simple fact that it takes huge costs and high technological capabilities to implement a Geographical Information System (GIS) as an analysis platform for such spatial data.

At the First ADRC International Meeting held February 16 to 18, 1999, a workshop was organized under the theme of "Utilization of Technologies." Discussions at the workshop revolved around the use of GIS and remote sensing technologies for disaster reduction. Conclusions of the workshop are as follows:

☐ Conclusion 1: All member countries recognize the importance and value of GIS and remote sensing technologies, and the advantages of information management.

☐ Conclusion 2: Future tasks include: real-time acquisition of satellite images, cost reduction in satellite data acquisition, technological support for introduction of GIS and remote sensing technologies, and establishment of technologies for extracting

disaster management information.

Thus. disaster management agencies of member countries showed strong interests in GIS and remote sensing technologies. At the same time, however, it became clear that enormous initial costs and the required technical standards presented the obstacles to the use of these technologies. Also blamed were the high usage costs for satellite image and map data.

To solve these problems, ADRC developed VENTEN (Vehicle through Electronic Network of disasTer gEographical informatioN), an Internet-based disaster management GIS that can be accessed by anyone from anywhere, using the rapidly expanding Internet. The basic framework of this system was developed as part of the "Asia Disaster Information Network System Development Research" project funded by the Japan Science and Technology Corporation (September 1998 - September 2001).

3-5-2-2. Outline of "Development Research on the Disaster Information Network System in Asian Region"

Granted funds from the Japan Science and Technology Corporation (ACT-JST segment: environment and safety), ADRC conducted a three-year "Asia Disaster Information Network System Development Research" project from September 1998 through September 2001. An Internet-based GIS disaster information system, "VENTEN" (Vehicle through Electronic Network of disasTer gEographical informatioN), was developed as part of the project.

The two main achievements of the project include:
- ❑ Construction of VENTEN - an internet GIS platform for disaster management information acquisition, and
- ❑ Development of the database on disaster management information

The issues that require further development include:
- ☐ Expansion and enhancement of the database
- ☐ Development of satellite data application technologies
- ☐ Interactive transmission of real-time disaster information

Study papers on this project have been compiled into the "Final Report on Development Research for Asia Disaster Information Network System "VENTEN" (ISBN 4-901614-01-0).

3-5-2-3. Objective of the development of "VENTEN"

The objective of the development of the VENTEN system is to provide both a system and data (including analysis results). This system is designed to be readily used with a personal computer connected to the Internet and installed with a WWW browser.

Although various organizations were already providing, free or at cost, not only basic map data including topographic and natural environment information, but also GIS data, it was necessary to convert the data format to the requirements of the GIS software in use in order to view and analyze these data. Therefore, in the development of the VENTEN system, various GIS data were converted into a VENTEN-compliant format to enable an integrated management of these data and the hardware.

Fig.3-5-2-1 illustrates the functional position of the VENTEN system in disaster data collection. On the left side of the Figure are data supplier organizations including various space research and development institutes and aerial photograph laboratories. from which the original primary data are provided. In order to extract useful information for disaster reduction from these primary data, a wide range of data processing tasks and data analyses are required. Also necessary are channels to send data thus extracted to working-level disaster management personnel. Disaster management researchers can browse and analyze data available from the VENTEN system. as well as feedback the results. The VENTEN system serves as a database and analysis tool for remote sensed disaster data, and