2. History and the current status of the Institute

2.1 History

The Disaster Prevention Research Institute (DPRI) was established in 1951 as a research institute in Kyoto University for the scientific study of natural disasters. Originally, there were three departments of Basic Science and Technology Research, Flood Damage Research, Earthquake Engineering and Wind Resistant Structures. It has since established more and more research sections and attached facilities to address the increased research needs that have arisen as a consequence of changes in social conditions and the diversification of natural disaster potential. By the end of 1995, the Institute had set up research sections, research centers, five observatories, and two experimental laboratories. Consequently, nearly all aspects of natural disasters, including earthquakes, volcanic eruptions, landslides, debris flows, floods, storm surges, and strong winds, are extensively investigated. Meanwhile, in addition to earth science and engineering points of view, human and sociological factors have also been studied with the aim being to develop software to strengthen our communities against disasters.

Nevertheless, the 1995 Hanshin-Awaji earthquake disaster not only revealed the vulnerability of Japan's big cities to disaster, but also exposed the absence of social system for risk management and disaster mitigation. However, DPRI did not have research sections investigating on these problems yet.

With the experience of Hanshin-Awaji earthquake disaster and increased social requirements for the study of natural hazards, in 1996 the Institute reorganized itself into five research divisions and five research centers; namely, Integrated Management of Disaster Risk; Earthquake Disaster Prevention; Geo-Disasters; Fluvial and Marine Disasters; Atmospheric Disasters; Research Center for Disaster Environment; Research Center for Earthquake Prediction; Sakurajima Volcano Research Center; Water Resources Research Center; and Research Center for Disaster Reduction Systems. The Division of Integrated Management of Disaster Risk and the Research Center for Disaster Reduction Systems have been set up by rearranging and increasing the number of staff members who have been involved in disaster study from human, social, and planning aspects. This reorganization helped us to combine research efforts and promote more comprehensive studies of natural hazards and sociological managements.

Together with the reorganization, DPRI had been certified as the "Center of Excellence (COE)" of Japan in natural disaster research field in 1997. The research staff members of the Institute are also affiliated with the Graduate Schools of Science, Engineering, and Informatics of Kyoto University, playing an important role on the education of Graduate Schools by the close combining of advanced and multidisciplinary researches and education.

Although the Institute belongs to Kyoto University, it has been open since 1996 to all researchers who are pursuing investigations of disasters all over the world. Collaboration is maintained through joint research projects and meetings. International research cooperation has also been widely and positively performed in the Institute. Through research programs, of IDNDR (International Decade for Natural Disaster Reduction), GAME, US-Japan Cooperative Research for Urban Earthquake Disaster Mitigation, UNESCO-IHP (International hydrological Programme), UNESCO-DPRI/KU cooperative research programme on the protection of the Cultural and Natural Heritage, DPRI has been highly and internationally evaluated. In 2002, "Investigation of disaster theory and establishment of disaster prevention knowledge" was selected by the Ministry of Education, Culture, Sports, Science and Technology, Japan, as one of the research bases in the field of "Interdisciplinary, multiple and new domain" of the 21st Century COE Program.

Table 2.1 History of Establishment of Research Facilities

1951/04/01	Establishment of the Disaster Prevention Research Institute (DPRI)
	Basic Science and Technology Research Section (R.S.)
	Flood Damage R.S.
	Earthquake Engineering and Wind Resistant Structures R.S.
1953/08/01	Ujigawa Hydraulics Laboratory
1958/04/01	Crustal Movement R.S.
1959/07/09	Landslide R.S.
1960/12/26	Hydrology R.S.
	Sakurajima Volcano Observatory
1961/04/01	Wind Resistant Structure Section and Coastal Disaster R.S.
1962/04/01	Geo-disasters R.S.
1962/07/01	Some sections of the Institute moved to Gokasho, Uji
1963/04/01	Geomorphology and Soil Disaster R.S.
	Drainage Engineering R.S.
	Earthquake Motion R.S. (renamed from Basic Science and Technology R.S.)
	Fluvial Disaster R.S. (renamed from Flood Damage R.S.)
	Earthquake Resistant Structures R.S. (renamed from Earthquake Engineering and Wind Resistant Structures R.S.)
1964/04/01	Foundation Seismic Disaster R.S. and Tottori Microearthquake Observatory
1965/04/01	Sabo R.S.
	Earthquake Prediction and Monitoring R.S. and Kamitakara Crustal Movement Observatory
1966/04/01	Applied Climatology R.S.
	Shionomisaki Wind Effect Laboratory and Shirahama Oceanographic Observatory
1967/06/01	Dynamics of Foundation Structures R.S.
	Donzurubo Crustal Movement Observatory and Hodaka Sedimentation Observatory
1969/04/01	Tokushima Landslide Observatory and Ogata Wave Observatory
1970/04/17	Hokuriku Microearthquake Observatory
1972/05/02	Disaster Prevention Science Information Center
1973/04/12	Microearthquake R.S.
1974/04/14	Miyazaki Crustal Movement Observatory
1977/04/18	Severe Storm R.S.
1978/04/01	Water Resources Research Center (Termination of Hydrology R.S.)
1979/04/01	Earthquake Resistant Plastic Structures R.S. (renamed from Earthquake Resistant Structures R.S.)
	Earthquake Resistant Brittle Structures R.S.

1982/04/01	Flood Control System R.S.
1986/04/05	Research Center on Earthquake-Resistant System of Urban Infrastructures
1990/06/08	Research Center for Earthquake Prediction by the integration of earthquake-prediction relevant organizations of DPRI and the Graduate School of Science of Kyoto University (Crustal Movement R.S., Earthquake Prediction and Monitoring R.S., Microearthquake R.S., Tottori Microearthquake Observatory, Kamitakara Crustal Movement Observatory, Donzurubo Crustal Movement Observatory, Hokuriku Microearthquake Observatory, and Miyazaki Crustal Movement Observatory were combined into this Center)
1992/03/03	Termination of Flood Control System R.S.
1992/04/10	R.S. for Urban Flood Hazard in Bay Areas
1993/04/01	Regional Disaster Prevention System Research Center (Termination of Disaster Prevention Science Information Center)
1996/03/31	Termination of Research Center on Earthquake-resistant system of Urban Infrastructures
1996/05/11	The Institute was reorganized into five Research Divisions (R.D.) and five Research Centers (R.C.), and designated as a nation-wide inter-university open institute. The Division of Technical Affairs is formed as a unit gathering all the Technicians in DPRI.
	R.D. of Integrated Management of Disaster Risk
	R.D. of Earthquake Disaster Prevention
	R.D. of Geo-Disasters
	R.D. of Fluvial and Marine Disasters
	R.D. of Atmospheric Disasters
	R.C. for Disaster Environment
	R.C. for Earthquake Prediction
	Sakurajima Volcano R.C.
	Water Resources R.C.
	R.C. for Disaster Reduction Systems
1997/04/01	Designated as the “Center of Excellence (COE)” for Scientific Research
2001/04/01	Natural Disaster Research Council was established.
2002/09/30	Selected as an institute in the 21st Century COE Program
2003/04/01	R.C. on Landslides

2.2 Organization and Management

(1) Organization

The current organization is shown in **Fig. 2.2.1**. It consists of five research divisions and six research centers.

(2) Staffs

The Disaster Prevention Research Institute (DPRI) was established in 1951 as part of Kyoto University for the scientific study of natural disaster. Originally, there were three departments with the limited fixed number of three Professors, two Associate Professors, three Research Associates, one administrator, and four general staffs.

Over years, the institute has expanded to meet the diversified needs of a growing science. At the end of March, 2002, the number of members had increased up to thirty-four Professors, thirty-eight Associate Professors, thirty-five Assistant Professor, twenty-two technical officers, and eight general staffs.

(3) Organization of management

The management system of DPRI was reorganized in 2003 illustrated in **Fig. 2.1**. Faculty Meeting, which consists of full-time Professors, called by Director can decide the necessary and important issues on management of DPRI. Three Vice Directors who taking charge in corresponded major committees support Director in Executive Board Meeting. Director can obtains the opinions from outside of DPRI in Advisory Committee that consists of

Kazuya INOUE (Director of DPRI)
Noboru SASAO (Dean of Graduate School of Science, Kyoto University)
Mitsuhiko ARAKI (Dean of Graduate School of Enginnering, Kyoto University)
Kouji TANAKA (Director of Center for Southeast Asian Studies, Kyoto University)
Takeo DOMOTO (Director of Institute of Low Temperature Science, Hokkaido University)
Teruo YAMASHITA(Director of Earthquake Research Institute, University of Tokyo)
Kenji NAKAMURA (Director of Institute for Hydrospheric-Atmospheric Sciences, Nagoya University)
Wataru KOTERAYAMA(Director of Research Institute for Applied Mechanics, Kyushu University)
Shuichi IKEBUCHI (Former Director of DPRI, Kyoto University)
Kojiro IRIKURA (Former Director of DPRI,)
Toshiharu KOJIRI (Vice Director of DPRI, Head of Exploratory Committee for Future Plans)
Naoto OSHIMAN (Vice Director of DPRI, Head of Research and Education Committee)
Hiromasa KAWAI (Vice Director of DPRI, Head of Public Relations and Information Management Committee)
Norio OKADA (Head of Self-evaluation Committee)

Director calls Representative Meeting for Overall Coordination consisting of chairpersons of departments of centers to consult the subjects of Faculty Meeting in advance.

Joint projects with collaborated researchers outside of DPRI are managed by Committee of Joint Research. Three Vice Directors take charge of Exploratory Committee for Future Plans, Research and Education Committee and Public Relations and Information Management Committee having other sub-committee, hierarchically. Furthermore, Coordination Committee for Research on Natural Disaster was set up to keep the collaboration with related researchers and promote natural disaster science in Japan. The center in DPRI has own steering committee to be managed with full-time staffs and several invited members from inside and outside of university.

(4) Division of Technical Affairs

see 2.4.6

Fig. 2.1 Current organization

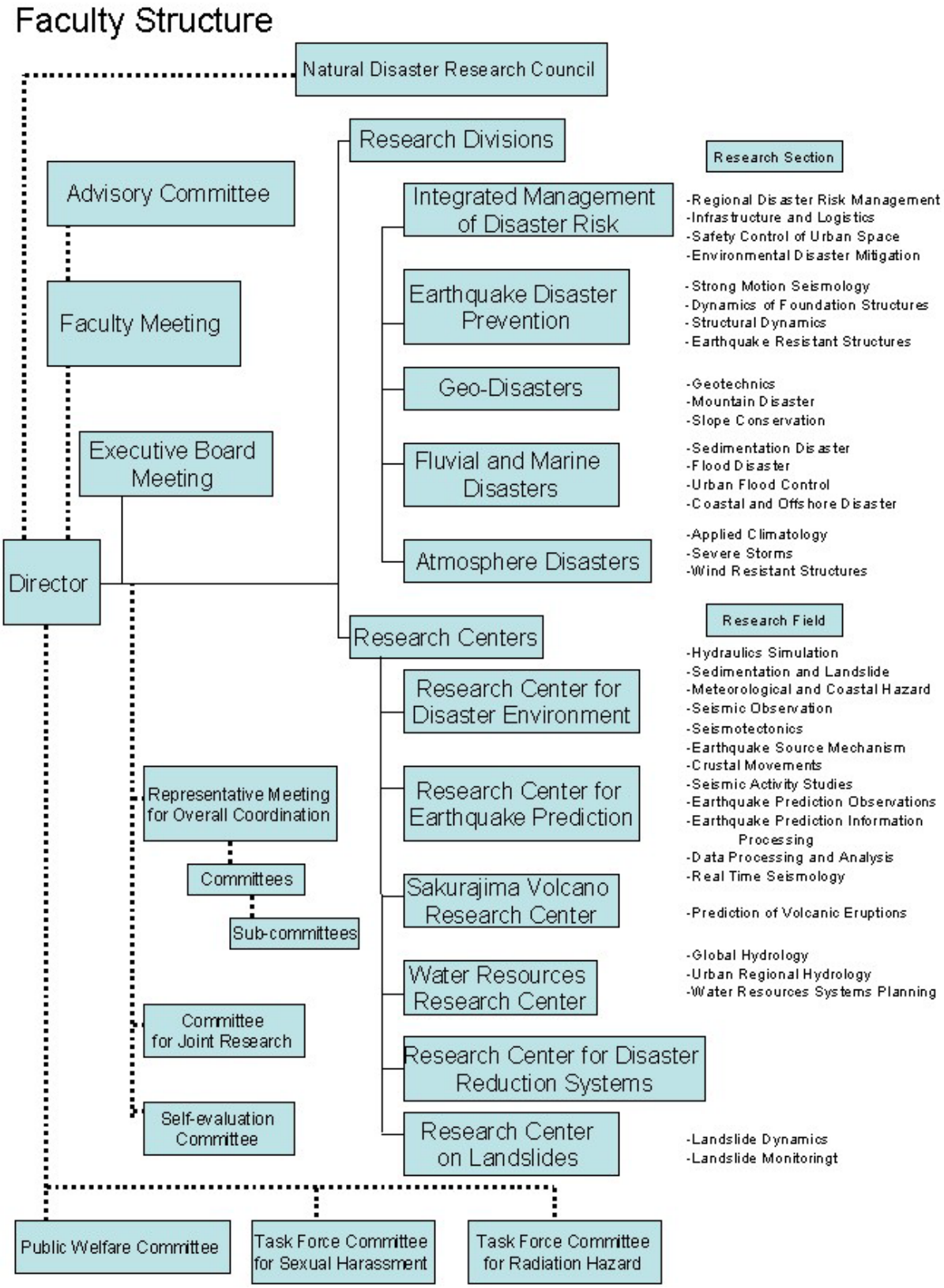
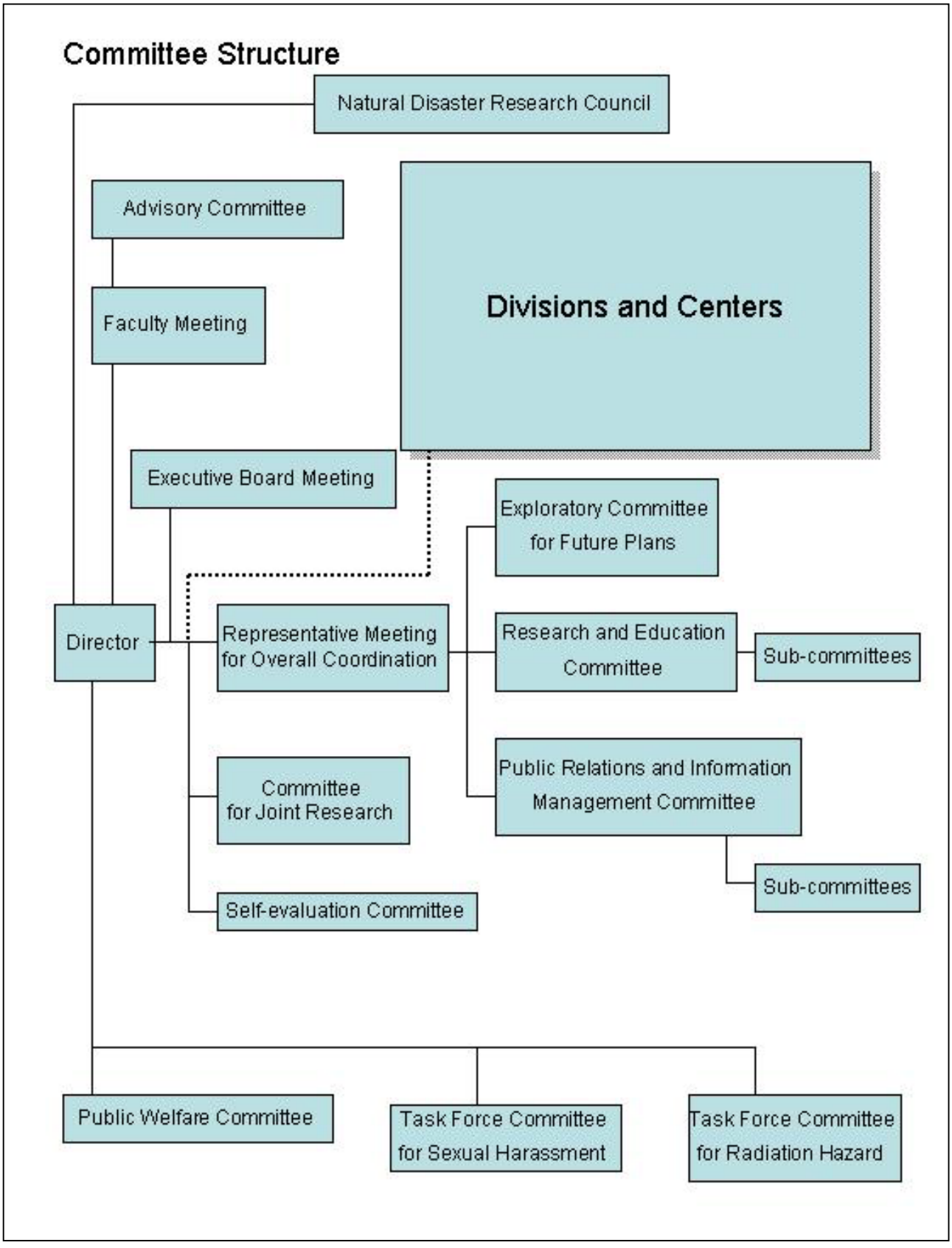


Fig. 2.2 Management

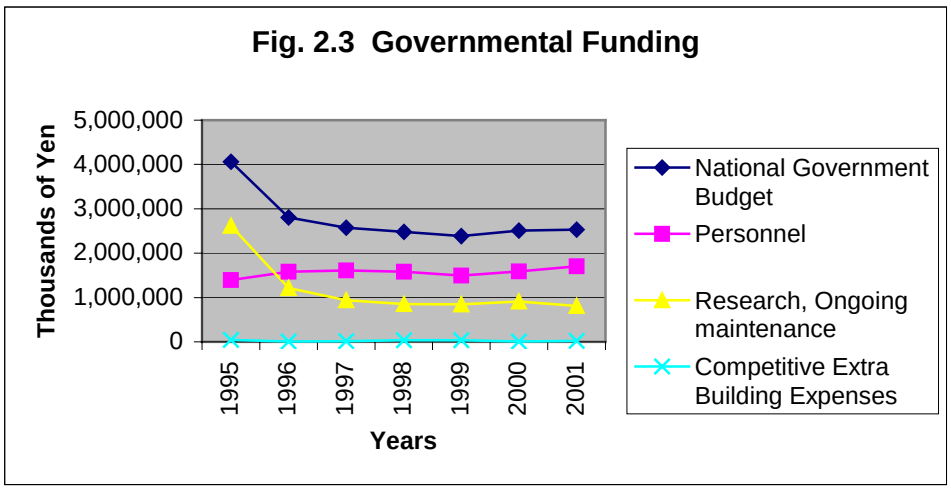


2.3 DPRI Annual Budget Description

The DPRI annual budget consists of governmental and supplemental funding. Governmental funding is described in **Table 2.2** and **Figure 2.3** below. There are additional special research projects underway that are bringing in extra sources of revenue.Personnel costs (faculty salaries, secretarial staff, etc), non-personnel costs (research, ongoing maintenance costs such as electricity, repairs, etc) and "competitive extra building expenses" are shown for the years 1995-2001. Note that all three of these costs have remained relatively steady since 1996 (costs are provided in thousands of Yen).

Table 2.2 DPRI Annual Budget (thousands of Yen)

	1995	1996	1997	1998	1999	2000	2001
Governmental Funding							
National Government Budget	4,059,340	2,806,665	2,571,229	2,475,245	2,383,031	2,510,565	2,530,143
Personnel	1,395,266	1,585,525	1,614,793	1,585,961	1,498,350	1,589,034	1,702,589
Research, Ongoing maintenance	2,618,074	1,215,640	942,536	850,342	848,751	913,998	806,733
Competitive Extra Building Expenses	46,000	5,500	13,900	38,942	35,930	7,533	20,821

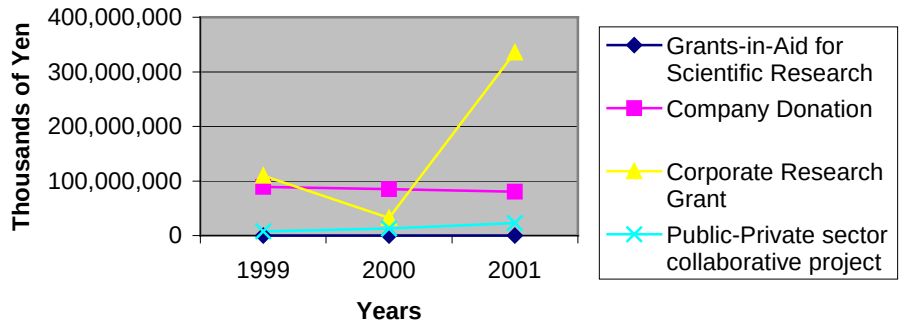


Supplemental Funding consists of Grants-in-aid for scientific research, company donations, corporate research grants and public-private sector collaborative projects. The revenues generated from these funding sources are shown for the years 1999, 2000 and 2001. Note that the corporate research grants have increased significantly in 2001. More details for Supplemental Funding are provided in **Table 2.3** and **Figure 2.4** below.

Table 2.3 Supplemental funding

Table 2. DPRI Annual Budget (thousands of Yen)			
Supplemental Funding	**1999**	**2000**	**2001**
Grants-in-Aid for Scientific Research	257,700	215,816	257,267
Company Donation	89,328,574	84,767,896	80,197,260
Corporate Research Grant	109,816,000	32,156,000	335,639,999
Public-Private sector collaborative project	7,500,000	13,000,000	22,977,500

Fig 2.4 Supplemental Funding



2.4 Environment for research and education

2.4.1 Research facilities

(Missing) Table 2.5

2.4.2 Library

DPRI did not have institute library officially approved although one of data storage rooms had been used as provisional one. At the time of incorporation of administration offices of research institutes and centers in the Uji campus in 2000, the inter-institute Uji Library of Kyoto University was officially founded and books and journals of all of institute libraries were merged into and all of functions and administrations were transferred to the new Uji Library.

The total amount of the library budget to purchase foreign and domestic science journals were 8,161,775 Yen (92 titles) and 827,119 Yen (54 titles) in 2001, and 8,195,665 Yen (95 titles) and 894,879 Yen (56 titles) in 2002, respectively.

2.4.3 Information Network System

Kyoto University has been very active in developing the campus network infrastructure named KUINS (Kyoto University Integrated Information System). Year 1996 marked the move of KUINS into the second-generation system KUINS-II, providing a super high-speed network infrastructure featured by ATM (Asynchronous Transfer Mode) technology. Notably, KUINS-II/ATM has strengthened a connection between the Main and Uji campuses to a level as high as 1.8Gbps on a double-track basis. To fully enjoy the potential of KUINS-II/ATM, we installed in a fiscal year of 1997 a comprehensive set of ATM switches, routers and switching hubs at the DPRI main building, facilitating a 100Mbps-based network across the Institute.

Further strengthening in the campus network has taken place since 2001, in the form of introducing KUINS-III featured by Gigabit Ethernet. The prime

consideration was to maintain the level of the network security while offering good services including access to the Internet. Most of individual user computers at the DPRI and other institutions at the University now are connected to KUINS-III and are given access to the Internet via KUINS-II with enhanced security control. The operation of KUINS-II and KUINS-III has been maintained by the Information Service Division of the Academic Center for Computing and Media Studies. The dedicated service around the clock is more than warranting the sum of the charges that are imposed on every user on a regular basis.

Since 1996, an inter-university satellite network called a SCS project has been ongoing to promote multimedia education at the member universities. Kyoto University is one of the most active members and has had VSAT (very-small-aperture terminal) stations installed at the University. The DPRI and other institutions at the Uji campus have shared a VSAT station for such applications as video conferences, remote lecturing and joint seminars. Also, the DPRI has been equipped with remote conferencing systems, facilitating better telecommunications between the Main and Uji campuses.

With the Katsura Campus being developed in mind, we consider that the network infrastructure along with multimedia technologies will be increasing important for our all aspects of activities regarding research, education and public outreach. We should also appreciate the importance of the Kyoto University information security policy so as to navigate in an ever challenging sea of the Internet age.

2.4.4 Databases

We have been making efforts to build up various kinds of databases in the DPRI as shown in **Table 2.6.**

Table 2.6 List of Databases

Database	Open status
Missing	Missing
Nation-wide earthquake observation data retrieval system	Internet
Hydrological Observation in Bangladesh	Open to researchers
database for GAME-HUBEX, GAME-Tibet and GAME-AAN	Open to scientific community through WWW and CD-ROM
Automated system of prediction of volcanic eruption at Sakurajima	Domestic collaborating researchers
Volcanic earthquakes and eruptions at Sakurajima	Domestic collaborating researchers
Videos of volcanic eruption at Sakurajima	Domestic collaborating researchers
SAIGAI Database	Missing

2.4.5 Supporting staffs for Researches

The numbers of supporting staffs in the DPRI in each year during the period from 2000 to 2003 are shown in **Table 2.7.** In 2004, the number of COE research fellows increased abruptly because the DPRI 21st Century COE Program supported by the Ministry of Education, Culture, Sports, Science and Technology was initiated in Dec. 2002.

For keeping up research activities in the DPRI, it is very important to maintain the good supporting staffs in the future, who can give support to each research project for conducting field observations and experiments using various kinds of facilities in the DPRI.

Table 2.7 Supporting staffs

		2000	2001	2002	2003
Permanent Position	Officials	0	0	0	0
	Technical Staffs	30	29	26	26
	Total	30	29	26	26
Impermanent Position	Official Assistant (day)	2	2	2	2
	Official Assistant (time)	41	38	44	49
	Technical Official Assistant (day)	2	1	1	1
	Technical Official Assistant (time)	6	3	3	8
	COE Research Fellows	8	6	3	23
	Research Support staff	7	8	7	7
	Research Assistant	18	23	28	31
	Total	84	81	88	121

2.4.6 The Division of Technical Affairs

Each staff of the Division of Technical Affairs (DTA) has been required to submit his/her business report since 2000 to grasp his/her achievements and to make him/her contribute to the projects efficiently. A new room of four spans has been prepared for the DTA on the first floor in the South-North building since 2001. Desks and chairs for every technical staffs working at Uji campus and two desks and chairs for technicians working at remote observatories has been prepared in the room, and technical staffs working at Uji campus have been obliged to attend the meeting there every morning.

The Technical Expert Committee had consisted of a Professor, five Associate Professors, a Research Associate, and the Head and four Group Leaders of the DTA until 2000, it has been reorganized with seven professors and two technical staff members in order to deepen all staffs' understandings of the DTA. The contents of the monthly business reports have been investigated to evaluate technical level of each technician and to make a database for technical supports. This database is now a valuable data source for young technicians.

Six members retired in 2002, and three new young technicians could be employed for the first time in 28 years. Because of the seat-cut bill for the government employees, new members could not be adopted for a long time. Two more members could be added in 2003, since two retired. They were employed on conditions that they were successful applicants of the examination for second-class civil and have the degree of M.A. Therefore, they have good academic background and have enough ability to improve technical support for research works. Besides, each of them studied mechanical engineering, electronic engineering, communication engineering or physics at the universities. They worked at many sections or research centers for training and obtaining various kinds of knowledge and techniques which are necessary to the research work of the Institute for the first one year. The total number of the members of the technical support division is 27 and most of them are older than 45 years old except for the five new comers. Therefore, the division has been activated by the new stuff members and will be much more improved by the employment of the new type engineers.

A workroom for making various kinds of devices had been maintained mainly by the Research Center for Earthquake Prediction, a part of the Institute. However, in 2002, the management of the workroom was raised in grade to belong to the Institute and the technical support division was in charge of the maintenance of it. One of the new

comers stays in the workroom in the afternoon. He works machine work to make mechanical and electronic devices and discusses technical problems on research work with researchers and students. Besides, he is in charge of many tools and devices which are used for research work.

Training program is very important to improve in technical capability. Therefore, we have participated in technical seminars held by many organizations as much as possible every year. In order to increase an opportunity, however, technical seminars given by us are planned as a new trial. The seminars are classified into the basic course and special course. In the basic course, we are aiming at mastering various kinds of high performance PC software and the seminar for acquiring the skill is opened not only to technical staffs but also to everyone in DPRI. Through the special course, the study meeting about new technology has been held twice every month. Participant collection is performed to the whole faculty members and students by E-mail.

Although it had been difficult for DTA to support a new project due to limited number of staffs who worked at existing divisions and research centers, three new staffs allow the DTA to support the new projects. In this fiscal year, the DTA joins two projects. One is a “Development of integrated disaster reduction systems on compound urban floods” at Ujigawa Open Laboratory. The DTA supported the preparations and experiment of the project by 6 staffs from August 2002 for more than 180 days. The fruit of the project was presented at Annual Meeting of DPRI and the support will be continued in 2003. The other one is “Making electronic archives of printed matters and video accumulated in DPRI and installation of quick search system at web site of DPRI”. Archives are made by 6 part-timers from January 2003 and electronic files will be made from 20-years Annuals of DPRI in 2003 fiscal year.

The care of mail and home page servers, the registration of new accounts and the maintenance of the network system are the daily work of the DTA. The security control, defending from hackers or protecting from computer viruses, is getting important more and more. Because the security is under constant threat of attack from newborn viruses the defense system must be renewed day by day. The DTA owed for these invisible supports. Uploads of publications on the homepage provide users with conveniences but the increase of user’s number causes lager risk of the system down by malicious invaders or improper operations. This requires not only to take precautionary measures but also to acquire skills to prevent damages from spreading and to repair quickly. From now on, information dispatch from DPRI should be increasing more and more. With continuous update of latest security information against viruses the DTA makes all possible efforts to establish the secure and safe organization for management and operation of network system.

2.4.7 Research Environment at Remote Laboratories and Observatories

Disaster Prevention Research Institute, Kyoto University, has 14 observatories and 2 laboratories at remote places from Uji campus. As the research topics become advanced, observation items come to diversify. In order to solve this problem, some observatories and laboratories have been fully automated for these years. Many observation items have to be dealt by one or two persons at many observatories and laboratories placing researchers and/or technicians, where the automated observations are difficult. As a result, labor of each staff at remote observatories and laboratories has become excessively heavy year by year. Moreover, one or few staffs are obliged to deal with dangerous works such as work in a pit, maritime work, and work in the dangerous area for volcanic eruption in order to maintain and inspect the observation facilities and to obtain data. **Table 2.8** shows staffs at each observatory.

Table 2.8 Staffs at the Remote Laboratories and Observatories

Note that number in the ( ) is that of person working at Uji campus. (as of April 1st, 2002)

	Professor	Associate Professor	Research Associate	Technicians
Research Center for Disaster Environment				
Ogata Wave Observatory	0	1 (1)	0	1
Hodaka Sedimentation Observatory	0	1	0	1
Ujigawa Hydraulics Laboratory	1	1	3	1
Shirahama Oceanographic Observatory	0	0	2 (1)	0
Shionomisaki Wind Effect Laboratory	0	1 (1)	0	1
Tokushima Landslide Observatory	0	1	1	0
Research Center for Earthquake Prediction				
Kamitakara Observatory	0	1 (1)	0	2
Hokuriku Observatory	0	0	0	0
Osakayama Observatory	0	0	0	0
Donzurubo Observatory	0	0	1	1
Tottori Observatory	0	0	1 (1)	1
Miyazaki Observatory	0	0	1	1
Abuyama Observatory	0	0	0	1
Tokushima Observatory	0	0	1	1
Sakurajima Volcano Research Center				
Sakurajima Volcanological Observatory	1	1	4	1