NISTEP REPORT No.39

Study of Regional Science and Technology Promotion

(2nd Survey)

－Analysis of Science & Technology Policies by Local Governments－

March 1995

Kazunari Takebe　Kazunori Sakata
Takeshi Yamamoto　Yasubumi Oyama　Kinji Gonda

4th Policy-Oriented Research Group
2nd Theory-Oriented Research Group

National Institute of Science and Technology Policy
(NISTEP)
Science and Technology Agency
Japan

Study of Regional Science and Technology Promotion (2nd Survey)

－Analysis of Science & Technology Policies by Local Governments－

March 1995

Kazunari Takebe　Kazunori Sakata
Takeshi Yamamoto　Yasubumi Oyama　Kinji Gonda

4th Policy-Oriented Research Group
2nd Theory-Oriented Research Group

National Institute of Science and Technology Policy
(NISTEP)
Science and Technology Agency
Japan

Table of Contents

CHAPTER 1 BACKGROUND AND OBJECTIVE

The situation of the world in relation with "regions" is undergoing dramatic changes with the rapid globalization of economic activities on one hand and the formation of new international order after the cold war. The former can be seen in the movement to form new regions by geophysically integrating economies beyond the framework of nations (and states) in search for the formation of new international economic order, and the latter can be seen in the movement to newly regionally disperse politics and economy for maintaining the framework of nations under a new regime. "Regions" begin to have an important meaning which cannot be identified in the conventional framework of "nations". Thus, the situation relating to "regions" is greatly changing at home and abroad.

These historical changes of the context concerning "regions" are inevitably greatly changing the conventional discipline of "the theory of regional policies" or "the theory of regional economic policies". This corresponds to the conversion from the theory of inter-region development to the question of intra-region development. The reason is that "the theory of regional policies" itself is being demanded newly drastically converted from "the theory of comparative superiority" of regional societies to "the theory of regional social systems".

On the other hand, in recent years, science and technology policies also tend to be more complicated, gigantic and diversified in subjects and scope amid the acceleration of technological innovation, advent of mega-science, diversification in science and technology needs, etc. Especially the creation of technological innovation and the responses to new science and technology are highlighted in the new discipline called the regional development of science and technology activities. In addition, it has been revealed that research and technological development activities heavily rely on the external economies including location factors. In this situation, the importance of "the theory of regional science and technology policies" is being recognized independently of the necessity of conversion in "the theory of regional policies". These concurrent and pluralistic changes of the environment surrounding "the theory of science and technology policies" and "the theory of regional policies" support the concept again from another aspect, that the regional promotion of science and technology activities can be a promising means for regional promotion.

Though the environment surrounding "science and technology" and "regions" is changing, we have to say that the systematic implementation of regional science and technology policies by the national and local governments in Japan has just started, and the policy paradigm for the situation, hence individual policy targets are not yet clarified enough.

Of course this never means that "science and technology policies" did not exist in respective regions of Japan, and it may be rather correct to say that "regional science and technology policies" with clear "consciousness" of regional "promotion of science and technology" have not been systematically implemented. Actually this can be seen from the result of the first survey (conducted in FY 1991 and published in FY 1992), that the total expenditure for science and technology spent by local governments in Japan (45 prefectural governments excluding Tokyo Metropolis and Nagasaki Prefecture) in FY 1990 reached 451,400 million yen, and that the amount corresponded to about 1/4 of the total amount of expenditure for science and technology spent by the national government in the same fiscal year.

The object of the present survey conducted based on the recognition of these situations is to provide basic data contributing to the formulation and implementation of regional science and technology policies suitable for the respective actual situations of the national and local governments, by identifying the specific contents of various science and technology policies implemented by the local governments and the structural features of the expenditure for science and technology spent by them, to continuously reveal the actual conditions of science and technology promotion policies in respective regions.

The survey methods were not basically changed though some questions and question methods were changed to improve the accuracy of questions, since it was intended to continue the "Survey on the present conditions and problems of prefectural governments and ordinance-designated city governments for comprehensive science and technology policies" conducted for the first time three years ago (implemented in FY 1991 and published in FY 1992) by National Institute of Science and Technology Policy. Since the survey is scheduled to be conducted every other year (the previous survey was conducted based on the settlement of FY 1990), the present survey was conducted based on the settlement

of FY 1992, to investigate the science and technology policies of the prefectural governments and the ordinance-designated city governments.

Details such as specific survey methods and items are described in the following chapter. The survey mainly covered (1) the science and technology policies of the prefectural governments and the ordinance-designated city governments and the expenditure spent by them, (2) activities of regional research institutes, and (3) research and technological development activities and support activities for them by the juridical foundations, third sectors, etc. established by local governments for promotion of science and technology.

CHAPTER 2 CONTENTS AND METHODS OF SURVEY

The fact-finding surveys for the present "Study of Regional Science and Technology Promotion" include the following three major fact-finding surveys.

(1) Fact-finding survey on the efforts of prefectural governments and ordinance-designated city governments for comprehensive science and technology policies, and the expenditure for science and technology spent by the local governments

(2) Fact-finding survey on the present conditions of research activities by regional research institutes (Kousetsushi: prefectural/municipal industrial research institutes)

(3) Fact-finding survey on the research activities, etc. by research institutions and R&D support institutions such as third sectors and juridical foundations (hereinafter called "third sectors & foundations")

The three fact-finding surveys are summarized below.

2-1 Fact-finding survey on the efforts of prefectural governments and ordinance-designated city governments for comprehensive science and technology policies, and the expenditure for science and technology spent by the local governments

(1) Survey subjects

A letter "request for cooperation for the survey on the expenditure for science and technology" dated November 5, 1993 and signed by the Director General of National Institute of Science and Technology Policy was sent together with a questionnaire to the 47 prefectural governors and 12 ordinance-designated-city governors (Sapporo City, Sendai City, Chiba City, Yokohama City, Kawasaki City, Nagoya City, Kyoto City, Osaka City, Kobe City, Hiroshima City, Kitakyushu City and Fukuoka City), asking them to cooperate in the survey on their comprehensive efforts for science and technology policies and their expenditure for science and technology (see Appendix). As a result, all the local governments answered the questionnaire.

The questionnaire was addressed, in principle, to the division in charge of science and technology policies of the respective prefectural governments and to the divisions in charge of planning of the respective ordinance-designated city governments.

(2) Survey items

The questionnaire included 24 questions in total. The questions can be classified into the following eight categories.

1) Comprehensive promotion of science and technology policies (council for science and technology, basic guidelines for science and technology policies, etc.)
2) Establishment and management of regional research institutes, university, college, etc. (inside the administration)
3) Establishment and management of third sectors, juridical foundations, etc. (outside the administration)
4) Promotion of measures for guidance, support and invitation
5) Promotion of measures for network formation such as research exchange
6) Promotion of measures for international exchange
7) Promotion of measures for raising competent R&D staff
8) Promotion of measures for enlightenment and prevalence promotion

In the previous survey conducted in 1992, the comprehensive promotion of science and technology policies such as the establishment of council for science and technology and the basic guidelines for science and technology policies were identified by collecting other relevant information, etc., but in the present survey, it was added as a survey item for the local authorities, to investigate as a package.

For the expenditure for science and technology, etc., the contents were basically as in the previous survey, to allow comparative study. Reordering the survey items and more appropriate questionnairing were carefully executed.

The question items of the present survey were different from those of the previous survey in the following points.

Table 2-1 Differences between FY 1990 and FY 1992

FY 1992	FY 1990	Question item	Difference in survey contents between FY 1990 and FY 1992
Q. 1	Q 21	Promotion of comprehensive science and technology administration	Questions on the establishment of council for science and technology and the basic guidelines for science and technology policies were added.
Q.2	Q.1	Running expenditure and number of personnel of regional research institutes	The portions appropriated for the regional research institutes were distinguished from those appropriated for the head office, as a revision to avoid any leak.
Q.3	Q.6	Plan for restructuring regional research institutes	
Q.4		Intensification of research functions of regional research institutes	New
Q.5	Q.2	Science and engineering academies	Previous survey covered only public academies, but the present survey also covered private academies additionally (amount of subsidy in the case of private academies)
Q.6	Q.3	Research expenditure of medical institutions	Previous survey covered only public institutions, but the present survey also covered private institutions.
Q.7	Q.4,7	R&D (support) institutions such as juridical foundations invested in or endowed by the local authority	Two questions (research institutions and R&D support institutions) in the previous survey were integrated.
Q.8	Q.8	Establishment of science and technology promotion fund (other than Q. 7)	
Q.9	Q.5	Prefectural or municipal natural science museum	Including the natural science division of general museum (only the amount appropriated for natural science was asked to be stated)
Q.10	Q.9	Joint research with national research institutions	Previous survey covered only money, etc. donated to national research institutions, etc. Present survey covered the expenditure spent for joint research with national research institutions, etc.
Q.11	Q.10	Raising of R&D oriented businesses and support for technological development and upgrading of local businesses (B: Financed activities A: Activities other than financed activities)	Present survey distinguished financed activities (B) from activities other than financed activities (A) (previous survey did not distinguish them)
Q.12	Q.11	Invitation of R&D oriented businesses (B: Financed activities A: Activities other than financed activities)	Present survey distinguished financed activities (B) from activities other than financed activities (A) (previous survey did not distinguish them) (Previous survey included the support for raising.)
Q.13	Q.12	Technological consultation and guidance for local businesses	
Q.14	Q.13	Research exchange among industrial, academic and governmental circles (other than ordinary exchange)	
Q.15	Q.23	Public invitation type R&D scheme	
Q.16	Q.14	System for providing science and technology information from outside the region	
Q.17	Q.15	Promotion of private research exchange	
Q.18	Q.16	Enrichment of science and technology education	
Q.19	Q.17	Raising competent R&D staff by technological training, vocational ability development, etc. (A: Private businesses B: Prefectural personnel)	The question is the same as that in previous survey. However, in present survey, that for private businesses, etc. was distinguished from that for prefectural personnel.
Q.20	Q.18	Raising young researchers (A: Private businesses B: Prefectural personnel)	The question is the same as that in previous survey. However, in present survey, that for private businesses, etc. was distinguished from that for prefectural personnel.
Q.21	Q.19	Improvement of the base for promoting international exchange	
Q.22	Q.20	Promotion of international exchange	Previous survey covered the acceptance of foreign researchers. Present survey also covered dispatch of researchers to overseas countries, invitation of international conferences, and international joint research.
Q.23	Q.22	Enlightenment and prevalence promotion of science and technology	The effect of the question is the same. However, previous survey covered the activities for deepening the understanding on prefectural science and technology administration, but present survey covered the activities for enhancing the interests of prefectural citizens in science and technology.
Q 24	Q 24	Preferentially challenged R&D subjects and technological subjects	Previous survey covered technological subjects in specific administrative areas, but present survey covered especially preferentially challenged R&D subjects and technological subjects.

2-2 Fact-finding survey on the present conditions of research activities by regional research institutes

(1) Surveyed institutions

Surveyed were 628 regional research institutes listed in "1993-1994 Japanese Experiment and Research Institution Directory" (supervised by Science and Technology Agency, published by Lattice) and 42 institutions found in a preliminary survey conducted for 47 prefectural governments and 12 ordinance-designated city governments, total 670 institutions (these regional research institutes include prefectural institutions and also city institutions). The previous survey covered 628 institutions listed in the above directory published by Lattice.

Answers to the questionnaire were obtained from 450 institutions. The collection rate was 67.2%.

(2) Survey items

The questionnaire consisted of 4 face items and 24 question items. The survey items can be classified into the following eight categories.

1) Times of establishment and restructuring
2) Research areas
3) Staff (personnel structure, age structure, education structure, foreign researchers, etc.)
4) Research management, and raising, treatment, etc. of researchers
5) Allocation, etc. of research budget
6) Installation of measuring and testing instruments
7) Activity results and research achievements
8) Joint research

The previous survey covered 628 institutions listed in the above directory (old edition) of Lattice. The questionnaire of the present survey was based on that of the previous survey, and further included such items as major research areas, number and expenditure of external research contracts, education and raising of research personnel, allocation of research budget, acceptance of research funds, other parties of joint research, etc., while excluding inexpensive research instruments, period of joint research, etc.

The survey items of the present survey and the differences from the previous survey were as listed below.

Table 2-2 Comparison in survey items between previous survey and present survey

Question No. in present survey	Question item and contents	Question No. in previous survey	Difference in comparison with previous survey
F1	Name, address, etc. of institution	F1	Nothing changed
F2	Date of establishment	F2	Nothing changed
F3	Year when restructuring was or will be accomplished	Q 14	Scheduled restructuring year added
–	Research category	F3	Deleted in present survey
F4	Major research areas	–	New
Q. 1	Personnel structure	Q 1	Breakdown of researchers added (term-limited loan researchers)
–	Change in the percentage of skillful personnel	Q 2	Deleted in present survey
Q.2	Age structure	Q 3	Nothing changed
Q.3	Average age of researchers	Q 4	Nothing changed
Q.4	Researchers' education structure	Q 5	Changes in previous survey, but results of each fiscal year in present survey
Q.5	Number of doctors	Q 6	Nothing changed
Q.6	Salary of 30-year-old researcher	Q 7	Nothing changed
Q.7	Number and expenditure of external research contracts	–	New
Q.8	Research equipment	Q 15	Less than 5 million yen instruments deleted
Q.9	Activity results	Q 16	Changes in previous survey, but results of each fiscal year in present survey
Q.10	Research achievements (papers, etc.)	–	New
Q.11	Hours of requested inspection	Q 17	Changes in previous survey, but results of each fiscal year in present survey
–	Organizational system	Q 11	Deleted in present survey
–	Periodical internal transfer of staff	Q 12	Deleted in present survey
Q.12	Research management	Q 13	Changes in previous survey, but results of each fiscal year in present survey
Q.13	Transfer of staff to and from other institutions	Q 8	Nothing changed
Q.14	Education and raising of researchers	–	New
Q.15	Efforts for improving research abilities	Q 27	Alternative answer added
Q.16	Allocation of research funds	–	New
–	Research budget appropriation method	Q 28	Deleted in present survey
Q.17	Acceptance of research funds	–	New
Q.18	Number of joint research cases	Q 18	Nothing changed
Q.19	Total amount of budget for joint research	Q 21	Question on borne expenditure changed
Q.20	Other parties of joint research	Q 19	Names of prefectures as other parties added
Q.21	Selection of joint research subjects	Q 23	Nothing changed
Q.22	Joint research intermediators	Q 24	Nothing changed
–	Joint research periods	Q 20	Deleted in present survey
–	Joint research subjects	Q 22	Deleted in present survey
–	Joint research evaluation	Q 25	Deleted in present survey
–	Treatment of joint research achievements	Q 26	Deleted in present survey
Q 23	Number of foreign researchers	Q 9	Nothing changed
Q 24	Treatment of foreign researchers	Q 10	Nothing changed

(3) Survey method

"Questionnairing concerning "Survey on the Effective Utilization of Regional Resources in Regional Promotion of Science and Technology" (for local public experiment and research institutions)" (see Appendix) was conducted in March, 1994 by Science & Technology and Economy Association based on a contract.

2-3 Fact-finding survey on the research activities, etc. by research institutions and R&D support institutions such as third sectors and juridical foundations

Local authorities such as prefectural governments conduct experiment and research through establishment and management of local public experiment and research institutions and in recent years, also participate in the establishment and management of research institutions and R&D support institutions such as third sectors and juridical foundations by fund raising based on investment or endowment, etc. for contribution to the regional promotion of R&D. However, the actual conditions of research activities by these third sectors & foundations have been little identified. So, the present survey newly included a fact-finding survey of only third sectors & foundations also based on the results of the previous survey.

(1) Surveyed institutions

The previous survey covered the 94 R&D institutions newly established after 1984 as questionnairing for "regionally newly established R&D institutions". The surveyed institutions also included public ER institutions. However, the present survey did not limit the institutions to those established after 1984, and for the regional research institutes, questionnairing was conducted for the regional research institutes of the above 2.2. So, based on a preliminarily conducted survey for prefectural governments, etc. and the following publications on the R&D support institutions, etc. utilizing the policy funds of the national government, the institutions to be surveyed were identified, and questionnairing was conducted for 175 institutions.

The answers to the questionnairing were obtained from 113 institutions, and the collection rate was 64.6%. The publications concerning R&D support institutions, etc. utilizing the policy funds of the national government were as follows.

1) List of Investment and Financing Projects of the Japan Key Technology Center
2) List of Research Cores prepared by Industrial Location Policy Division, Environmental Protection and Industrial Location Bureau, Ministry of International Trade and Industry
3) Outline of Financing and Investment Projects of Bio-oriented Technology Research Advancement Institution
4) Pamphlet on Research Foundation Improvement Projects of New Energy and Industrial Technology Development Organization
5) Publication of The Adverse Drug Sufferings Relief and Research Promotion Fund

(2) Survey items

The questionnaire included 6 face items and 24 question items. The survey items can be classified into the following nine categories.

1) Times of establishment and restructuring
2) Basic properties or capital
3) Research areas
4) Staff (personnel structure, age structure, education structure, foreign researchers, etc.)
5) Research management, and the raising, treatment, etc. of researchers
6) Allocation, etc. of research budget
7) Installation of measuring and testing instruments
8) Activity results and research achievements
9) Joint research

The questionnaire of the present survey was based on that of the previous survey, and further included such items as major research areas, education and raising of research personnel, research budget and its allocation, names of prefectures as other parties of joint research, etc., while excluding inexpensive research instruments, period of joint research, etc.

Table 2-3 Comparison in survey items between previous survey and present survey

Question No. in present survey	Question item and contents	Question No. in previous survey	Difference in comparison with previous survey
F1	Name and address of institution, answerer, etc.	F1	Nothing changed
F2	Date of establishment	F2	Nothing changed
F3	Year when restructuring was or will be effected	Q 14	Scheduled restructuring year added
F4	Basic properties or capital	F3	Nothing changed
F5	Research fund source	–	New
F6	Major research areas	–	New
Q 1	Personnel structure	Q 1	Breakdown of researchers added (term-limited, loan researchers, etc.)
Q 2	Age structure	Q 2	Nothing changed
Q 3	Average age of researchers	Q 3	Nothing changed
Q 4	Researchers' education structure	Q 4	Nothing changed
Q 5	Number of doctors	Q 5	Nothing changed
Q 6	Salary of 30-year-old researcher	Q 6	Nothing changed
Q 7	Research conducting pattern	–	New
Q 8	Number and expenditure of external research contracts	–	New
Q 9	Building and equipment possession pattern	–	New
Q 10	Research equipment	Q 12	Instruments of less than 5 million yen deleted
Q 11	Activity results	Q 13	Nothing changed
Q 12	Research achievements (papers, etc.)	–	New
–	Organizational system	Q 10	Deleted in present survey
Q 13	Research management	Q 11	Nothing changed
Q 14	Transfer of staff to and from other institutions	–	Nothing changed
–	Owner at the time of establishment	Q 7	Deleted in present survey
Q 15	Educating and training of researchers	–	New
Q 16	Efforts to improve research abilities	Q 24	Alternative answer added
Q 17	Allocation of research fund	–	New
–	Research budget appropriation method	Q 25	Deleted in present survey
Q 18	Number of joint research cases	Q 15	Nothing changed
Q 19	Total amount of joint research budget	Q 18	Question on borne expenditure changed
Q 20	Other parties of joint research	Q 16	Names of prefectures as other parties added
Q 21	Selection of joint research subjects	Q 20	Nothing changed
Q 22	Joint research intermediators	Q 21	Nothing changed
–	Joint research periods	Q 17	Deleted in present survey
–	Joint research subjects	Q 19	Deleted in present survey
–	Joint research evaluation	Q 22	Deleted in present survey
–	Treatment of joint research achievements	Q 23	Deleted in present survey
Q 23	Number of foreign researchers	Q 8	Nothing changed
Q 24	Treatment of foreign researchers	Q 9	Nothing changed

(3) Survey method

"Questionnairing concerning "Survey on the Effective Utilization of Regional Resources in Regional Promotion of Science and Technology" (for research institutions and R&D support institutions such as third sectors and juridical foundations)" (see Appendix) was conducted in March, 1994 by Science & Technology and Economy Association based on a contract.

CHAPTER 3 PROMOTION OF COMPREHENSIVE SCIENCE AND TECHNOLOGY POLICIES IN RESPECTIVE REGIONS, AND CONDITIONS OF EXPENDITURE FOR SCIENCE AND TECHNOLOGY

This chapter describes the science and technology policies of prefectural governments and ordinance-designated city governments in FY 1992 and the conditions of the expenditure for science and technology, based on "Fact-finding survey on the efforts of prefectural governments and ordinance-designated city governments for comprehensive science and technology policies, and the expenditure for science and technology spent by the local authorities" conducted for the respective prefectural governments and ordinance-designated city governments in November, 1993.

"A Study of Regional Science and Technology Promotion — Analysis of Science and Technology Policies by Local Governments —" (NISTEP Report No. 23, August, 1992) reported the actual expenditure for regional science and technology in FY 1990 analyzed based on the answers from 45 prefectural governments and 7 ordinance-designated city governments. For the present survey, answers were obtained from all the 47 prefectural governments and 12 ordinance-designated city governments. So, this report could compile the entire image of regional science and technology policies in Japan and of the expenditure for science and technology spent by the local governments for the first time.

The "expenditure for regional science and technology" taken up here refers to the expenditure spent by the prefectural governments and the ordinance-designated city governments as found in the present survey, and did not include the expenditure spent by the third sectors and juridical foundations established with the investment or endowment by the local governments subordinate to any prefectural government other than the ordinance-designated city governments, private businesses, the national government and other local governments.

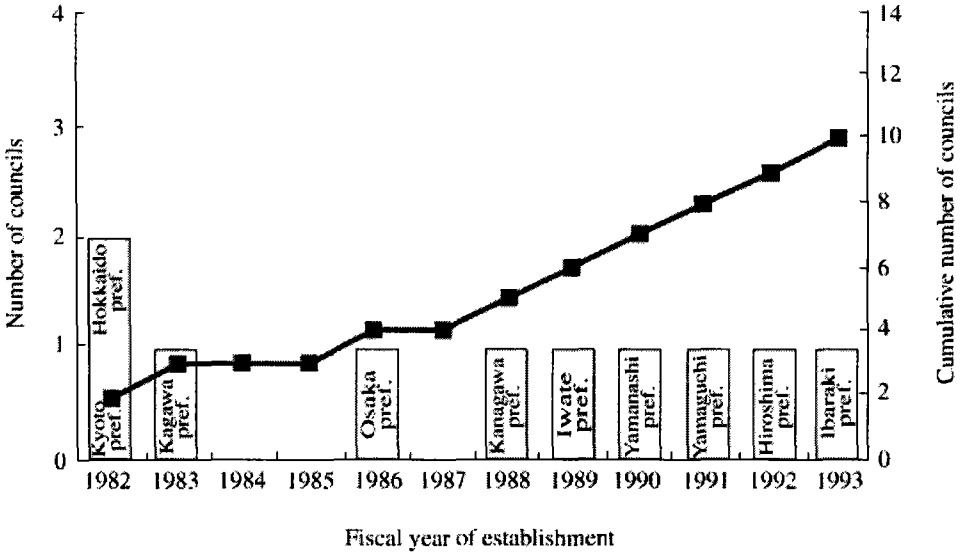
3-1 Comprehensive promotion of science and technology policies in respective regions

(1) Establishment of council for science and technology

As shown in Fig. 3-1-1, ten prefectures have councils such as councils for science and technology. In the previous survey, 11 prefectures had councils such as councils for science and technology. Thereafter, the councils were abolished in four prefectures of Saitama, Ishikawa, Shizuoka and Hyogo, and after FY 1990, such councils were newly established in three prefectures of Yamaguchi (FY 1991), Hiroshima (FY 1992) and Ibaraki (FY 1993).

The councils such as councils for science and technology are different in position and matters to be discussed, from prefecture to prefecture (Table 3-1-2).

Fig. 3-1-1 Changes in the number of prefectural councils for science and technology (those existing as of the end of FY 1993)



See Table 3-1-2.

(2) Establishment of exclusive administrative section in charge of science and technology policies

As shown in Table 3-1-1, 9 prefectures answered that they had exclusive administrative functions in charge of science and technology. In the previous survey, 3 prefectures of Hokkaido, Saitama and Kanagawa answered they had. So, exclusive functions for science and technology have increased sharply in recent years.

Eleven prefectures of Iwate, Saitama, Kanagawa, Toyama, Yamanashi, Shizuoka, Hyogo, Wakayama, Hiroshima, Yamaguchi and Kagoshima answered they had conducted comprehensive promotion activities for science and technology. The comprehensive and cross-sectional efforts made included the management of a council for science and technology, holding of seminars and symposia, comprehensive coordination of science and technology policies, and intensive liaison between experiment and research institutions (Table 3-1-3).

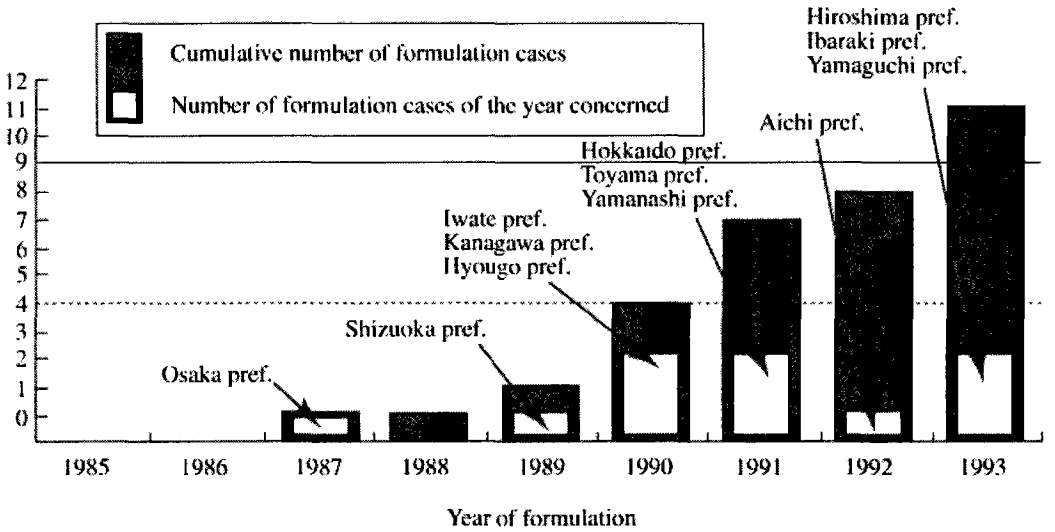
Table 3-1-1 Exclusive functions for science and technology in respective prefectures

Name of prefecture	Name of exclusive function
Hokkaido	Chief officer (science) in Coordination Section, Planning and Promotion Department
Iwate	Science and Technology Promotion Office, Planning and Coordination Section, Planning and Coordination Department (newly established on April 1, 1993)
Saitama	An officer in charge of science and technology and military base problems, Planning and General Affairs Section, Planning and Financial Department
Kanagawa	Science and Technology Policies Office, Planning Department
Yamanashi	An officer in charge of science and technology, Planning Section, Planning and Citizens Bureau
Hyogo	Planning Councilor (in charge of science & technology and information & communication), Planning Department
Hiroshima	An officer in charge of science and technology, Manufacturing Industry Technology Section, Commerce & Industry and Labor Department
Yamaguchi	Technology Promotion Team, Manufacturing Industry Promotion Section, Commerce & Industry and Labor Department
Saga	Information and Science & Technology Sub-section, Information System Section, Planning Bureau

(3) Formulation of basic guidelines for science and technology policies

As shown in Fig. 3-1-2, 6 prefectures formulated basic guidelines for science and technology policies by FY 1990, and thereafter further 6 prefectures formulated them. Total 12 prefectures made such efforts.

Fig. 3-1-2 Changes in the formulation of basic guidelines for prefectural science and technology policies



See Table 3-1-4.

As described above, the prefectures which made efforts by establishing a council for science and technology policies, formulating basic guidelines, establishing an exclusive function or performing comprehensive promotion activities, etc. are 16 prefectures of Hokkaido, Iwate, Ibaraki, Saitama, Kanagawa, Toyama, Shizuoka, Yamanashi, Kyoto, Osaka, Hyogo, Wakayama, Hiroshima, Yamaguchi, Saga and Kagoshima, accounting for as large as about one third of all the prefectures in Japan. These efforts relatively rapidly spread from the latter half of the 1980s as can be seen from established councils for science and technology and formulated basic guidelines, but whether this tendency will prevail throughout Japan must be watched.

Established councils for science and technology policies, formulated guidelines and established exclusive functions expressed on the Japanese map are shown in Fig. 3-1-3.

Fig. 3-1-3 Established councils for science and technology, formulated basic guidelines for science and technology policies, and established exclusive functions (as of the end of FY 1993)

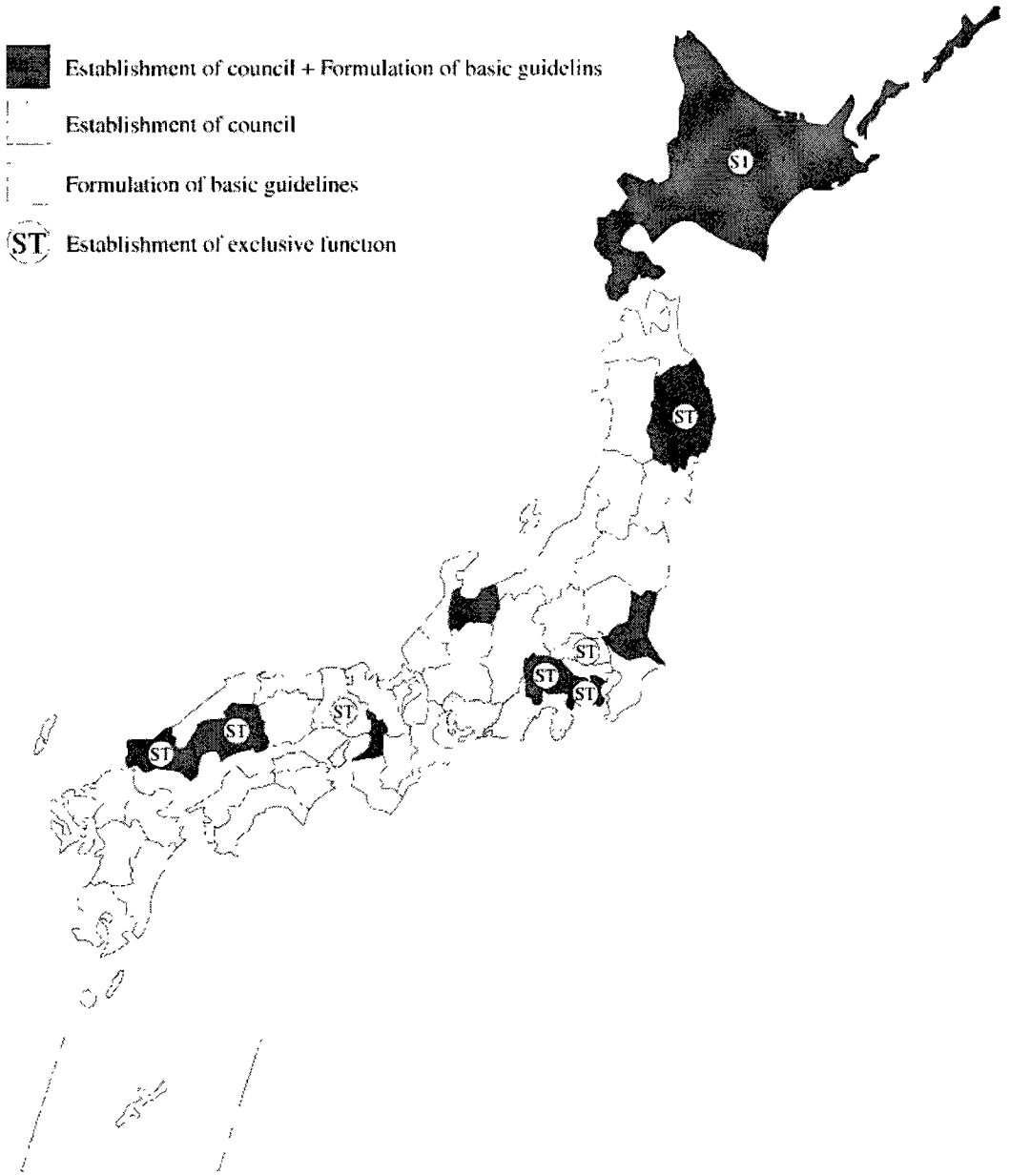


Table 3-1-2 Prefectural councils for science and technology

Name of prefecture	Hokkaido
Name of council	Hokkaido Council for Science and Technology
Date of establishment	September 1, 1952
Applicable regulations, etc.	Hokkaido Regulations for Council of Science and Technology
Chairman	Chikara Hiroshige, President of Hokkaido University
Members	30 pundits (industrial, academic and governmental)
Duty	To discuss various measures for integrating science and technology into Hokkaido administration
Competent section in charge	

Name of prefecture	Iwate Prefecture
Name of council	Iwate Prefectural Council for Promotion of Science and Technology
Date of establishment	April, 1989
Applicable regulations, etc.	Main Principles for Establishment
Chairman	Governor
Members	Consisting of appointed officers with Deputy Governor as the vice chairman, and President Nishizawa of Tohoku University, et al. as advisers
Duty	Discussion for planning and promoting science and technology promotion measures in the prefecture from a comprehensive long-term viewpoint
Competent section in charge	Science and Technology Promotion Office

Name of prefecture	Ibaraki Prefecture
Name of council	Ibaraki Academy
Date of establishment	FY 1993
Applicable regulations, etc.	
Chairman	Not yet decided
Members	Not yet decided
Duty	Not yet decided
Competent section in charge	Commerce & Industry and Labor Department (Manufacturing Industry Promotion Section)

Name of prefecture	Kanagawa Prefecture
Name of council	Kanagawa Prefectural Council for Science and Technology
Date of establishment	June, 1988
Applicable regulations, etc.	Main Principles for Establishing Kanagawa Prefectural Council for Science and Technology
Chairman	
Members	17 members (having sub-committees)
Duty	• Basic and comprehensive policies for science and technology • Important efforts for science and technology made by the prefectural government • Activation of prefectural experiment and research institutions • Other important matters necessary for promotion of science and technology
Competent section in charge	Science and Technology Policy Office, Planning Department

Name of prefecture	Toyama Prefecture
Name of council	Toyama Prefectural Council for Science and Technology
Date of establishment	November, 1983
Applicable regulations, etc.	Main Principles for Establishing Toyama Prefectural Council for Science and Technology
Chairman	Tomomichi Yanagida
Members	20 members
Duty	To discuss the directions in the promotion of science and technology to be pursued by Toyama Prefectural Government, and guidelines for measures to be taken in those directions, etc., and to make proposals to the governor as required.
Competent section in charge	Planning and Coordination Office

Name of prefecture	Yamanashi Prefecture
Name of council	Yamanashi Prefectural Council for Science and Technology
Date of establishment	September, 1990
Applicable regulations, etc.	Main Principles for Establishing Yamanashi Prefectural Council for Science and Technology
Chairman	Satoru Ohmura
Members	
Duty	The objective is to promote science and technology in Yamanashi Prefecture for contribution to the improvement of citizens' life and regional activation. The council is expected to discuss the following matters and to make proposals to the governor as required. • Basic directions in the promotion of science and technology to be pursued by the prefectural government, and guidelines for measures to be taken in those directions • Guidelines for prefectural experiment and research institutions
Competent section in charge	Planning Section, Planning and Citizens Bureau

Name of prefecture	Kyoto Prefecture
Name of council	Kyoto Prefectural Council for Science and Technology
Date of establishment	September, 1961
Applicable regulations, etc.	Regulations for Establishing Affiliates of Kyoto Prefectural Government, and Rules of Kyoto Prefectural Council for Science and Technology
Chairman	Takao Okada (Professor, Engineering Department, Kyoto University)
Members	11 university professors and 4 industrial representatives
Duty	Discussion on the measures for promoting science and technology
Competent section in charge	Commerce & Industry Department

Name of prefecture	Osaka Prefecture
Name of council	Osaka Prefectural Round-Table for Science and Technology
Date of establishment	December, 1986
Applicable regulations, etc.	Main Principles for Establishing Osaka Prefectural Round-Table for Science and Technology
Chairman	Adviser to Osaka Prefectural Government
Members	Chairman of Osaka Science and Technology Center, President of Osaka University, Chairman of Osaka Association of Manufacturers, etc.
Duty	To exchange opinions on the guidelines for promotion of science and technology in Osaka, etc. from a wide point of view.
Competent section in charge	Administration Supervision Office

Name of prefecture	Hiroshima Prefecture
Name of council	Hiroshima Prefectural Council for Promotion of Science and Technology
Date of establishment	May, 1992
Applicable regulations, etc.	Main Principles for Establishing Hiroshima Prefectural Council for Promotion of Science and Technology
Chairman	Noriyori Yoshida (Chairman)
Members	17 members
Duty	To discuss the following matters • Basic directions in the promotion of science and technology • Measures for promotion of science and technology • Other matters for promotion of science and technology
Competent section in charge	Officer in charge of science and technology, Manufacturing Industry Technology Section, Commerce & Industry and Labor Department

Name of prefecture	Yamaguchi Prefecture
Name of council	Yamaguchi Prefectural Council for Promotion of Science and Technology
Date of establishment	May, 1991
Applicable regulations, etc.	Main Principles for Establishing and Managing Yamaguchi Prefectural Council for Promotion of Science and Technology
Chairman	
Members	12 members from industrial, academic and governmental circles
Duty	To make proposals on the following matters to the governor • Basic and comprehensive policies for promotion of science and technology • Activation of prefectural experiment and research institutions • Other matters for promotion of science and technology
Competent section in charge	Officer in charge of science and technology, Manufacturing Industry Technology Section, Commerce & Industry and Labor Department

Table 3-1-3 Comprehensive promotion activities for prefectural science and technology policies

Administrative category	Name of prefecture	Name of activities	Competent division	FY 1992 expenditure (in 1000 yen)	Outline of activities
Commerce & Industry	Shizuoka	Experiment and research coordination activities expenditure	Commerce & Industry and Labor Dept.	3,089	• To comprehensively and systematically promote experiment and research.
	Hiroshima	Science and technology promotion activities	Commerce & Industry and Labor Dept.	12,000	• To establish and manage Council for Promotion of Science and Technology, and to commission the surveys on science and technology under contracts
	Yamaguchi	Regional science and technology promotion activities	Commerce & Industry and Labor Dept.	306,992	• To manage Yamaguchi Prefectural Council for Promotion of Science and Technology • To raise funds for regional promotion of science and technology • Commendation by awarding encouraging prizes for promotion of Yamaguchi Prefectural science and technology
Planning and General Affairs	Iwate	Science and technology promotion expenditure	Planning and Coordination Dept.	12,030	• Holding of meetings of Council for Promotion of Science and Technology • Support for holding a discussion meeting for Universal Geological Council, International Symposium for Research on Earth Depths, etc. • Burden charge for holding Tohoku Remote Sensing Seminar • Identifying the Trends for Space Industry Base • General coordination for science and technology in prefectural administration (Reference: "Science and Technology Promotion Office" was established in FY 1993.)
	Saitama	Science and technology policies promotion expenditure	Planning and Finance Dept.	601	To discuss Saitama Prefectural science and technology policies for the 21st century and to promote and coordinate science and technology activities, for example, by intensified liaison between regional research institutes for enriching the experiment and research scheme.
	Kanagawa	Council for Science and Technology expenditure	Planning Dept.	4,725	To discuss basic matters for comprehensive science and technology policies and to hold meetings of Kanagawa Prefectural Council for Science and Technology.
	Kanagawa	Major science and technology policies promotion expenditure	Planning Dept.	1,100	To follow up "Kanagawa Prefectural Major Policies for Science and Technology" and "Promotion Plan".
	Kanagawa	Science and technology liaison and coordination expenditure	Planning Dept.	3,298	To generally coordinate the promotion of science and technology policies and to prepare "Kanagawa Science and Technology Information".
	Toyama	Council for Science and Technology expenditure	Planning and Citizens Dept.	907	To manage Council for Science and Technology, etc.
	Yamanashi	Science and technology promotion activities	Citizens Planning Sec., Planning Dept.	10,034	To hold meetings of Yamanashi Prefectural Council for Science and Technology • To hold "Easy Science and Technology Seminar" (322,000 yen) • To hold Yamanashi Prefectural Symposium on Science and Technology (679,000 yen) • Research exchange promotion and coordination expenditure (6,192,000 yen)
	Hyogo	Science and technology promotion expenditure	Planning Dept.	176,741	• To activate prefectural experiment and research institutions • To promote collaborative R&D among industrial, academic and governmental circles • To conduct a survey on the promotion of science and technology • To endow Japanese Association for Regional Research Exchange • To promote Nishiharima Technopolis Development Plan, and so on
	Wakayama	Science & technology and energy utilization promotion activities	Regional Promotion Sec., Planning Dept.	573	• To collect information
	Kagoshima	New technology general promotion activities	Planning Dept.	1,982	• To manage Technological Development Conference of Prefectural Industrial Research Institutes and other related meetings.
Total				534,072	

Table 3-1-4 Basic guidelines for prefectural science and technology policies

Name of prefecture	Hokkaido
Basic guidelines	Basic policies for promotion of science and technology in Hokkaido
Date of establishment	April, 1991
Basic directions of policies	1. Activation and creation of regional industries 2. Harmony with nature and improving of living environment 3. Promotion of internationalization 4. Comprehensive and cross-sectional promotion of science and technology 5. Fostering creative competence of R&D staff
Specific policy proposals	
Section in charge	Coordination Section, Planning and Promotion Department

Name of prefecture	Iwate Prefecture
Basic guidelines	Guidelines for promotion of science and technology in Iwate Prefecture
Date of establishment	May, 1990
Basic directions of policies	• Directional signs of policies to be promoted by the prefectural government in the area of science and technology • Request for cooperation to the national government, universities and subordinate local governments for accomplishment of policies • Encouraging private businesses, etc. to develop independent positive activities
Specific policy proposals	Responses to regional needs (energy, space science, etc.), creation of new bases for promoting science and technology, training and securing researchers and engineers, utilization of research achievements, promotion of Tohoku Intelligent Cosmos Idea, etc.
Section in charge	Science and Technology Promotion Office

Name of prefecture	Ibaraki Prefecture
Basic guidelines	
Date of establishment	End of FY 1993
Basic directions of policies	Not yet decided
Specific policy proposals	Not yet decided
Section in charge	Commerce & Industry and Labor Department (Manufacturing Industry Promotion Section)

Name of prefecture	Kanagawa Prefecture
Basic guidelines	Kanagawa Prefectural Major Policies for Science and Technology
Date of establishment	May, 1990
Basic directions of policies	• Improvement of life quality • Upgrading of regional industries • Contribution to the creation and progress of knowledge
Specific policy proposals	I. Improvement of the base for promoting science and technology 1. Improvement of R&D base 2. Raising and anchoring of creative competent R&D staff 3. Promotion of international cooperation 4. Promotion of open science and technology policies and intensification of the scheme for it II. Priority areas of R&D 1. Promotion of human and social science and technology 2. Promotion of industrial science and technology 3. Promotion of creative science and technology
Section in charge	Science and Technology Policy Office, Planning Department

Name of prefecture	Toyama Prefecture
Basic guidelines	Toyama Prefectural Science and Technology Plan
Date of establishment	October, 1991
Basic directions of policies	To aim at creating a brain base of Toyama
Specific policy proposals	Opening of Japan Sea Museum, Children's Future Museum, the postgraduate course of the prefectural university, etc.
Section in charge	Planning and Coordination Office

Name of prefecture	Yamanashi Prefecture
Basic guidelines	Yamanashi Prefectural Major Policies for Science and Technology
Date of establishment	March, 1992
Basic directions of policies	1) Realization of abundantly creative cultural climate 2) Realization of abundant citizens' life 3) Realization of comfortable climate where nature and human beings are harmonized 4) Realization of characteristic industrial structure 5) Promotion of international exchange and international cooperation
Specific policy proposals	
Section in charge	Planning Section, Planning and Citizens Bureau

Name of prefecture	Shizuoka Prefecture
Basic guidelines	Basic directions of science and technology promotion policies in Shizuoka Prefecture
Date of establishment	January, 1990
Basic directions of policies	To aim at the establishment of the prefecture on the bases of science and technology
Specific policy proposals	1) Guidelines for improving the foundation for promotion of science and technology 2) Measures for utilizing electronics for industrial activation 3) Guidelines for intensifying information mainly for upgrading science and technology functions
Section in charge	Manufacturing Industry Siting and Technology Section, Commerce & Industry and Labor Department

Name of prefecture	Aichi Prefecture
Basic guidelines	Basic Plan of Science and Technology Exchange Center
Date of establishment	March, 1993
Basic directions of policies	• Activation of exchange activities concerning science and technology • Regional creation of new science and technology • Formation of the base in "Aichi Academic R&D Zone"
Specific policy proposals	1. Establishment of a juridical organization for promoting the activities of research exchange, joint research, etc. 2. Improvement of facilities as a base for extensive exchange activities for science and technology
Section in charge	• Planning Section, Planning Department • Manufacturing Industry Promotion Section, Commerce & Industry Department

Name of prefecture	Osaka Prefecture
Basic guidelines	Osaka Prefectural R&D Major Policies
Date of establishment	March, 1988
Basic directions of policies	• To contribute to regional activation • To contribute to the improvement of citizens' life • To contribute to internationalization
Specific policy proposals	• Encouragement to organize research groups for advanced technologies • Formation of complexes to induce the upgrading and sophistication of technologies • Construction of social capital to support higher quality life • Construction of regional society which citizens can be proud of • Enhancement of functions as a base for promoting research exchange • Promotion of research cooperation activities
Section in charge	Administration Supervision Office

Name of prefecture	Hyogo Prefecture
Basic guidelines	*Hyogo Prefectural Major Policies for Science and Technology*
Date of establishment	March, 1991
Basic directions of policies	• Promotion of science and technology for improving citizens' life and activating regional economy • Respect to fundamental research utilizing regional characteristics • Development of comprehensive science and technology policies
Specific policy proposals	• Improvement of the base for promoting science and technology • Formation of fundamental research institution • Expansion and improvement of prefectural experiment and research institutions • Promotion of network formation with international society • Raising and anchoring of creative competent R&D staff • Improvement of the scheme for promotion of science and technology
Section in charge	Planning councilor (in charge of science & technology and information & communication)

Name of prefecture	Hiroshima Prefecture
Basic guidelines	Basic directions in the promotion of science and technology in Hiroshima prefecture (proposed by the council)
Date of establishment	November, 1993
Basic directions of policies	• Creative innovation of regional industries • Creation of rich and cozy regional society • Promotion of fundamental and leading R&D • International cooperation from the region through science and technology
Specific policy proposals	• Formation of regional center of excellence • Formation of creative technology development and industrialization support system • Raising and security of competent creative scientists and engineers • Formation of research exchange network connecting the prefecture with outside • Formation of creative and abundant region capable of growing science and technology • Improvement of the scheme for promoting and supporting science and technology
Section in charge	Officer in charge of science and technology, Manufacturing Industry Technology Section, Commerce & Industry and Labor Department

Name of prefecture	Yamaguchi Prefecture
Basic guidelines	Yamaguchi Prefectural Guidelines for Promotion of Science and Technology
Date of establishment	March, 1994
Basic directions of policies	
Specific policy proposals	
Section in charge	Manufacturing Industry Promotion Section, Commerce & Industry and Labor Department

3-2 Regional expenditure for science and technology

(1) Total amount of regional expenditure for science and technology

The total amount of expenditure for science and technology spent by 47 prefectural governments in FY 1992 was about 575,100 million yen, and the total amount spent by 12 ordinance-designated city governments were about 38,900 million yen. The total expenditure of all the local governments was about 614,000 million yen. The average per prefecture was about 12,200 million yen, and the average per ordinance-designated city, about 3,200 million yen (Table 3-2-1).

Table 3-2-1 Total amount of expenditure for science and technology (FY 1992)

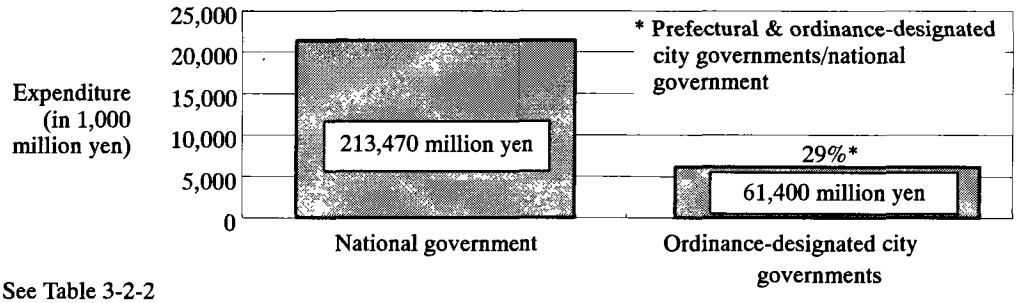
(In one million yen)

	47 prefectures	12 ordinance-designated cities	Total
Expenditure for science and technology	575,062	38,914	613,976
Average	12,235	3,243	—

Note: From the answered expenditure for science and technology, the expenditure for financed activities was subtracted.

The total amount of the national government's budge for science and technology in FY 1992 was about 2,134,700 million yen. So, the expenditure of about 614,000 million yen spent by the prefectural governments and ordinance-designated city governments in FY 1992 corresponded to 29% of the national government's budget for science and technology (Fig. 3-2-1).

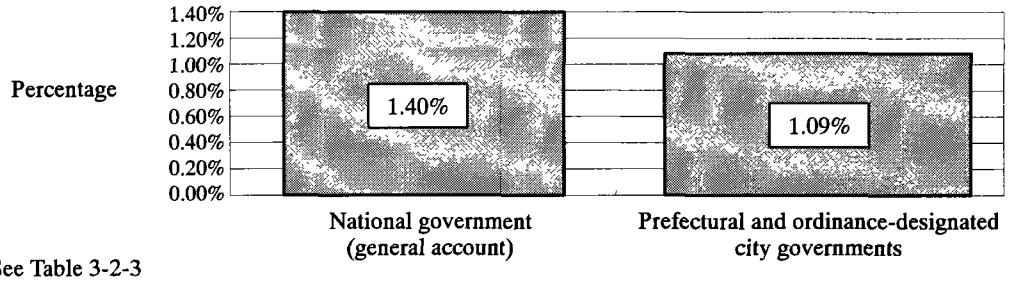
Fig. 3-2-1 Comparison between national government and prefectural governments in the expenditure for science and technology (FY 1992)



See Table 3-2-2

The expenditure spent by prefectural and ordinance-designated city governments for science and technology was about 614,000 million yen, accounting for 1.1% of the total amount of government expenditure of prefectural and ordinance-designated city governments. On the other hand, as for the national government's expenditure for science and technology, the amount appropriated in the general account accounted for 1.4% (original budget of FY 1992) of the total amount of the general account (Fig. 3-2-2).

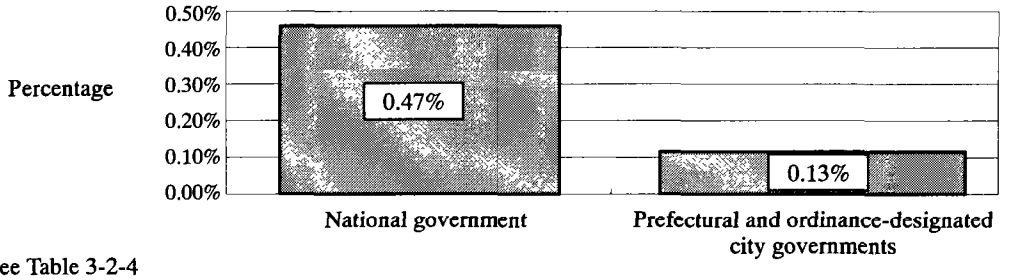
Fig. 3-2-2 Comparison between the total government expenditure and the expenditure for science and technology



See Table 3-2-3

Furthermore, the expenditure spent by prefectural and ordinance-designated city governments for science and technology accounted for 0.13% of the total amount of gross prefectural products (FY 1991). On the other hand, the percentage of the national government's total budget for science and technology (FY 1992) to GNP (FY 1991) was 0.47% (Fig. 3-2-3).

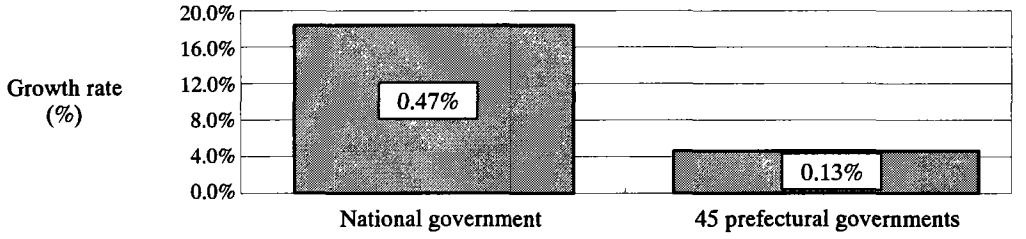
Fig. 3-2-3 Percentage of the expenditure for science and technology to gross national (prefectural) product



See Table 3-2-4

The growth rate of the expenditure for science and technology in FY 1992 in the 45 prefectural governments which allow comparison with the previous survey (results of FY 1990) was 18%, higher than the growth rate of 11% of the national government's budget for science and technology to that of FY 1990 (Fig. 3-2-4). Also in the following comparison in the expenditure for science and technology between FY 1990 and FY 1992, the expenditure of only 45 prefectures excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities is compared.

Fig. 3-2-4 Comparison in the expenditure spent by 45 prefectural governments for science and technology between FY 1990 and FY 1992 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)



See Table 3-2-5

Table 3-2-2 Comparison in the expenditure for science and technology between national government and prefectural governments (FY 1992)

(In one million yen)

	a. Nation *	b. Prefectures and ordinance-designated cities	b/a
Expenditure for science and technology	2,134,676	613,976	28.8%

Source: * Expenditure for science and technology in FY 1992 budget bill (Science and Technology Policy Bureau, Science and Technology Agency, March, 1992)

Table 3-2-3 Comparison between total amount of government expenditure and expenditure for science and technology (FY 1992)

(In one million yen)

	a. Total amount of government expenditure (budget)	b. Expenditure for science and technology	b/a
General account budget of national government*	72,218,011	1,011,009	1.40%
Government expenditure of prefectural and ordinance-designated city governments**	56,408,901	613,976	1.90%

Sources: * Expenditure for science and technology in FY 1992 budget bill (Science and Technology Policy Bureau, Science and Technology Agency, March, 1992)

** Present Conditions of Local Finance (Ministry of Home Affairs, March, 1994)

Table 3-2-4 Gross domestic (prefectural) product and expenditure for science and technology

(In 1,000 million yen)

	a. Gross product (FY 1991)	b. Expenditure for science and technology (FY 1992)	b/a
National government *	455,442	2,135	0.47%
Prefectural governments **	468,608	614	0.13

Sources: * National Economic Accounting Annual Report (Economic Research Institute, Economic Planning Agency)

** Prefectural Economy Annual Report (Economic Research Institute, Economic Planning Agency)

Table 3-2-5 Comparison in the expenditure for science and technology of 45 prefectural governments between FY 1990 and FY 1992 (excluding Tokyo Metropolis and Nagasaki Prefecture)

(In one million yen)

	FY1990	FY1992	FY1992/ FY1990
National government *	1,920,841	2,134,676	111.1%
45 prefectural governments	451,392	534,278	118.4%

Source: * Expenditure for science and technology in FY 1992 budget bill (Science and Technology Policy Bureau, Science and Technology Agency, March, 1992)

(2) Breakdown of regional expenditure for science and technology into respective competent administrative divisions

Fig. 3-2-5 shows the breakdown the total expenditure for science and technology spent by prefectural governments, that spent by ordinance-designated city governments, and that spent by both prefectural and ordinance-designated city governments, into respective competent administrative divisions.

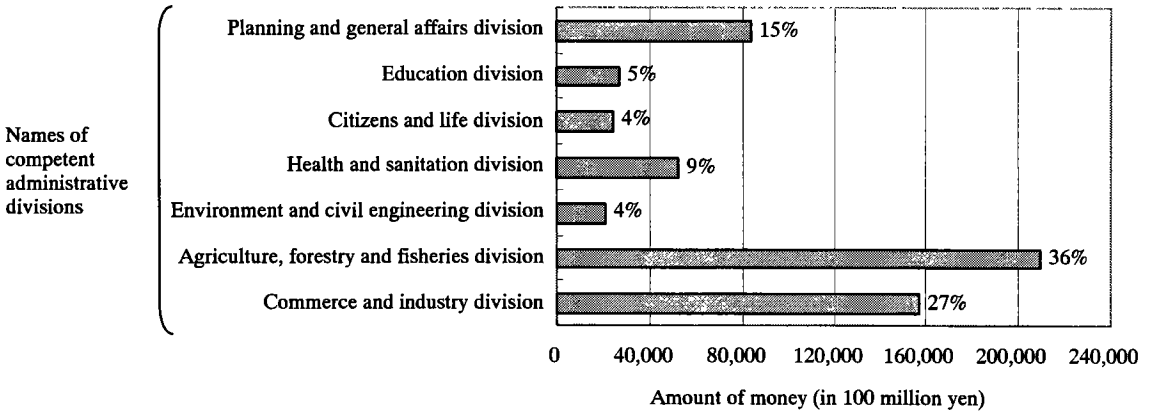
In the expenditure spent by prefectural governments, the largest percentage of 36% was recorded by the agriculture, forestry and fisheries division, being followed by 27% of the commerce and industry division. Both the divisions accounted for more than 60% of the total. These divisions were followed by 15% recorded by the planning and general affairs division. In further breakdown, in the agriculture, forestry and fisheries division and the commerce and industry division, the percentage of regional research institutes was high, and in the planning and general affairs division, the percentage of academies was high.

In the expenditure spent by ordinance-designated city governments, the division showing the largest percentage was the education division accounting for more than 60% (62%). The reason is that Yokohama Municipal University is engaged in the management and construction of Biology Research Institute. It was followed by 15% of the commerce and industry division and 12% of the health and sanitation division in this order. The expenditure spent by ordinance-designated municipal governments did not include that of the agriculture, forestry and fisheries division at all, but the activities conducted by Yokohama City University for Biology Research Institute belonging to the education division among competent administrative divisions belonged to the agriculture, forestry and fisheries division in the classification into respective service categories described later.

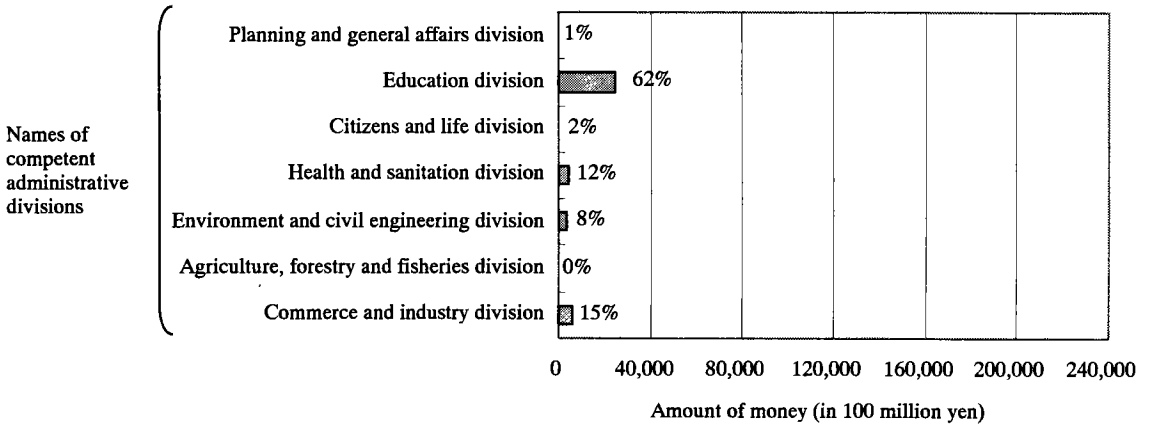
Also in the total expenditure spent by prefectural and ordinance-designated city governments, the division showing the largest percentage was the agriculture, forestry and fisheries division accounting for 34%, being followed by 27% of the commerce and industry division. Both the divisions accounted for more than 60%, being followed by 14% of the planning and general affairs division.

Fig. 3-2-5 Breakdown of expenditure for science and technology into respective competent administrative divisions (FY 1992)

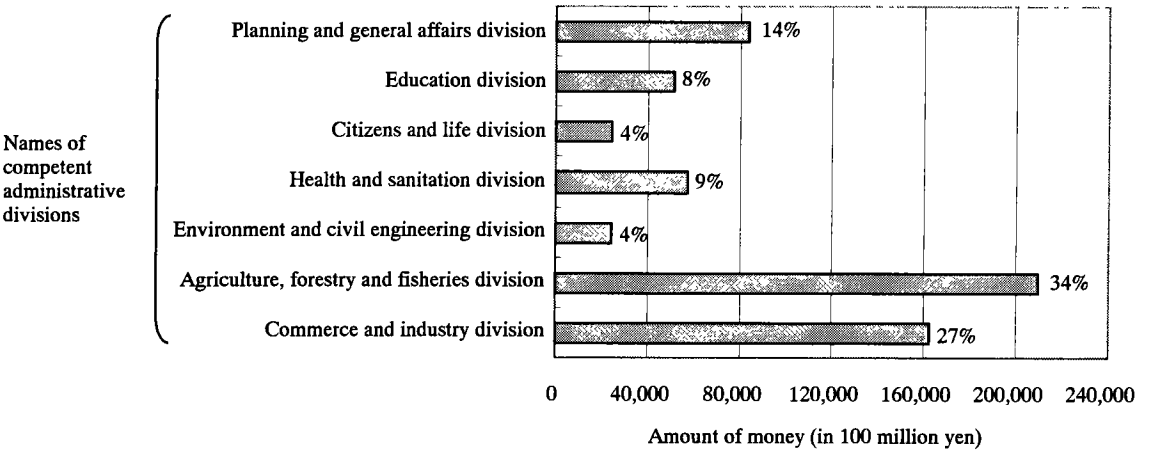
(a) Prefectural governments (total amount: 575,062 million yen)



(b) Ordinance-designated city governments (total amount: 38,914 million yen)

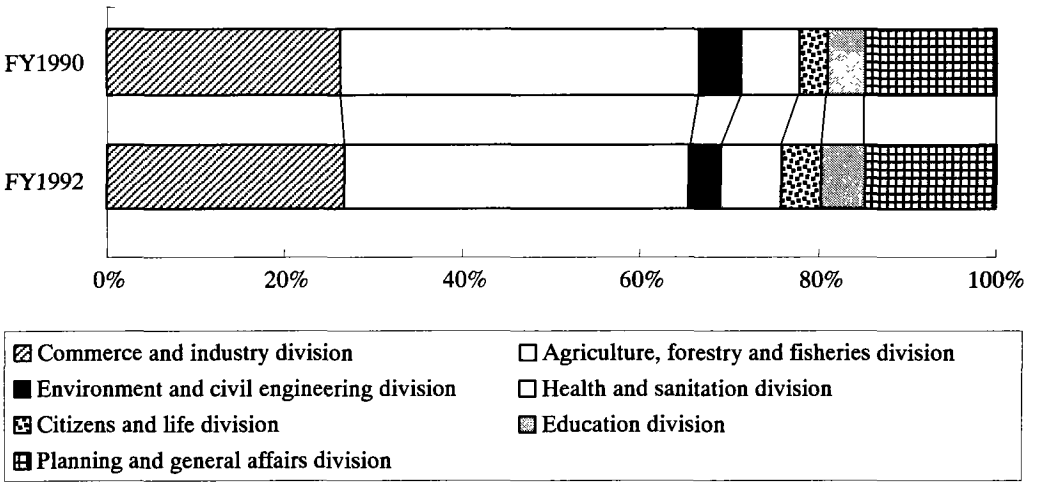


(c) Total of prefectural and ordinance-designated city governments (total amount: 613,976 million yen)



In comparison with the results of the previous survey conducted for 45 prefectural governments in FY 1990, as shown in Fig. 3-2-6, there were no large differences though the agriculture, forestry and fisheries division showing the largest percentage declined from 40.2% to 38.8% by 1.4%, while the citizens and life division rose from 3.2% to 4.4% by 1.2%, the education division rising from 4.1% to 4.9% by 0.8%.

Fig. 3-2-6 Comparison in the breakdown of the expenditure for science and technology into respective competent administrative divisions of 45 prefectural governments, between FY 1990 and FY 1992 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated city governments)



See Table 3-2-7.

Table 3-2-6 Breakdown of expenditure for science and technology into respective competent administrative divisions (FY 1992)

Competent administrative division	47 prefectures		12 ordinance-designated cities		Total	
	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage
Commerce and industry division	156,883	27.3%	5,875	15.1%	162,758	26.5%
Agriculture, forestry and fisheries division	209,587	36.4%	0	0.0%	209,587	34.1%
Environment and civil engineering division	21,345	3.7%	3,237	8.3%	24,582	4.0%
Health and sanitation division	52,510	9.1%	4,501	11.6%	57,011	9.3%
Citizens and life division	24,076	4.2%	609	1.6%	24,685	4.0%
Education division	27,209	4.7%	24,261	62.3%	51,470	8.4%
Planning and general affairs division	83,453	14.5%	430	1.1%	83,884	13.7%
Total	575,062	100.0%	38,914	100.0%	613,976	100.0%

Table 3-2-7 Comparison in the breakdown of expenditure for science and technology into respective competent administrative divisions of 45 prefectural governments between FY 1990 and FY 1992
(excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)

Competent administrative division	FY1990		FY1992	
	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage
Commerce and industry division	118,631	26.3%	142,007	26.6%
Agriculture, forestry and fisheries division	181,528	40.2%	207,235	38.8%
Environment and civil engineering division	21,599	4.8%	18,903	3.5%
Health and sanitation division	29,853	6.6%	37,312	7.0%
Citizens and life division	14,421	3.2%	23,470	4.4%
Education division	18,478	4.1%	26,131	4.9%
Planning and general affairs division	66,881	14.8%	79,220	14.8%
Total	451,391	100.0%	534,278	100.0%

(3) Breakdown of regional expenditure for science and technology into respective service categories

Fig. 3-2-7 shows the breakdown of the total expenditure for science and technology of prefectural governments into respective service categories, that of ordinance-designated city governments and that of both prefectural and ordinance-designated city governments. The present survey investigated the breakdown into respective service categories, as well as that into respective competent administrative divisions. For example, an agriculture short-term college under the jurisdiction of the agriculture, forestry and fisheries division among respective competent administrative divisions is classified to belong to education among respective service categories. A prefectural university under the jurisdiction of the planning and general affairs division is also classified to belong to education among respective service categories. In the case of Tokyo Metropolis, the regional research institutes concerned with agriculture, forestry and fisheries are classified to belong to the commerce and industry division among respective competent administrative divisions because they are under the jurisdiction of Labor and Economy Bureau, but are classified to belong to agriculture, forestry and fisheries among respective service categories. Since the same service category can be under the jurisdiction of different administrative divisions among respective prefectural governments like this, it was attempted to break down the expenditure for science and technology with attention paid to service categories, as well as to competent administrative divisions.

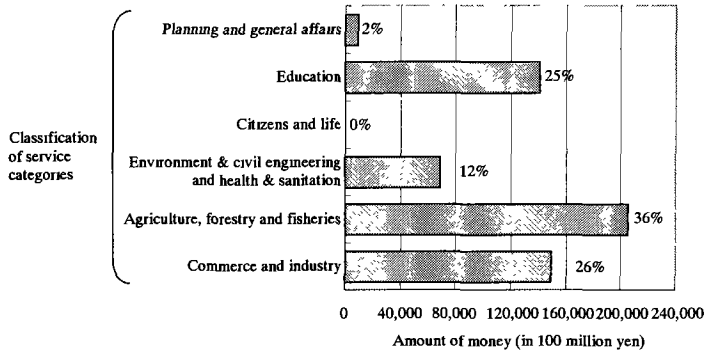
In view of respective service categories, since it is often impossible to divide an environmental health research institute (center) or sanitation and pollution research institute (center) into the environment & civil engineering category and the health & sanitation category, environment & civil engineering and health & sanitation were treated as one service category. So, six service categories of commerce and industry category, agriculture, forestry and fisheries category, environment & civil engineering and health & sanitation category, citizens and life category, education category, and planning and general affairs category were established.

In the case of prefectural governments, the agriculture, forestry and fisheries category (36%) and the commerce and industry category (26%) were largest in this order, but unlike the classification into competent administrative divisions, they were followed by high 25% of the education category. The reason is that the science and engineering colleges and short-term colleges under the jurisdiction of the planning and general affairs division or the citizens and life division, the agriculture colleges, agriculture short-term colleges, etc. under the jurisdiction of the agriculture,

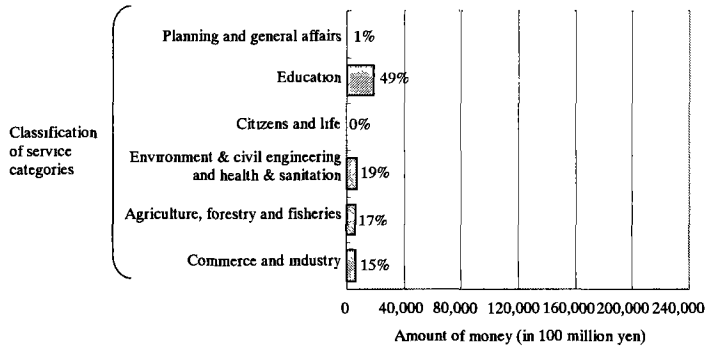
forestry and fisheries division, and the medical colleges, sanitation short-term colleges, nurse short-term colleges, etc. under the jurisdiction of the health and sanitation division are classified to belong to education among service categories.

Fig. 3-2-7 Breakdown of expenditure for science and technology into respective service categories (FY 1992)

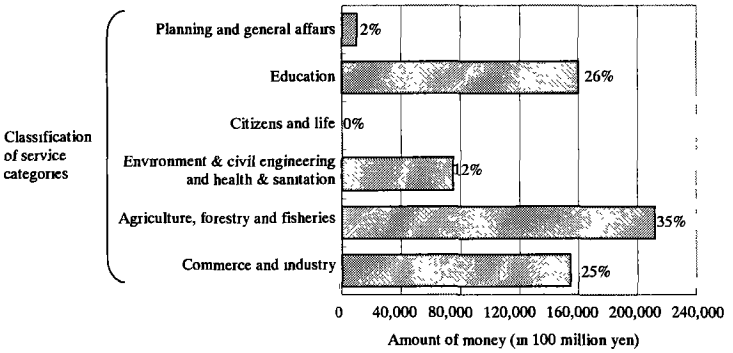
(a) Prefectural governments (total amount: 575,062 million yen)



(b) Ordinance-designated city governments



(c) Prefectural and ordinance-designated city governments



In the case of ordinance-designated city governments, the highest percentage was 49% of education. Only education accounted for less than 50%. It was followed by 19% of environment & civil engineering and health & sanitation, 17% of agriculture, forestry and fisheries and 15% of commerce and industry. The education which accounted for 62% among respective competent administrative divisions decreased to 49% among respective service categories, and the agriculture, forestry and fisheries which was zero among respective competent administrative divisions accounted for 17% among respective service categories. The reason is that the activities concerned with Biology Research Institute of Yokohama City University classified to belong to

education among respective competent administrative divisions were classified to belong to agriculture, forestry and fisheries among respective service categories.

In the total of both prefectural and ordinance-designated city governments, the highest percentage was 35% of agriculture, forestry and fisheries, being followed by 26% of education and 25% of commerce and industry in this order. Unlike the classification into respective competent administrative divisions, it is notable that the non-industrial education took a high place of second.

Table 3-2-8 Breakdown of expenditure for science and technology into respective service categories (FY 1992)

Service category	47 prefectures		12 ordinance-designated city governments		Total	
	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage
Commerce and industry	149,005	25.9%	5,874	15.1%	154,879	25.2%
Agriculture, forestry and fisheries	205,363	35.7%	6,495	16.7%	211,858	34.5%
Environment & civil engineering and health & sanitation	68,651	11.9%	7,196	18.5%	75,847	12.4%
Citizens and life	1,068	0.2%	1	0.0%	1,069	0.2%
Education	141,408	24.6%	18,963	48.7%	160,371	26.1%
Planning and general affairs	9,567	1.7%	385	1.0%	9,952	1.6%
Total	575,062	100.0%	38,914	100.0%	613,976	100.0%

(4) Breakdown of regional expenditure for science and technology into respective purposes

Table 3-2-9 classifies the question items of the questionnaire into respective purposes. Purpose-classified values of expenditure are shown in Fig. 3-2-8.

Table 3-2-9 Classification of question items of the questionnaire into respective purposes

Purpose	Question	Question No. of questionnaire
Comprehensive promotion of science and technology policies	Comprehensive promotion expenditure for science and technology administration	Q1
	Establishment of exclusive function in charge of science and technology	
	Establishment of council for science and technology, etc.	
	Formulation of basic guidelines for science and technology policies	
Local public experiment and research institutions	Regional research institutes running expenditure	Q2
	Regional research institutes restructuring expenditure	Q3
	Research function intensifying expenditure for regional research institutes	Q4
Academies	Science and engineering academy expenditure (local public and private)	Q5
R&D institutions such as juridical foundations	Expenditure to the R&D (support) institutions invested in or endowed by local authorities	Q7
(Science and technology promotion fund)	Fund for the purpose of promoting science and technology (other than Q7)	Q8
Support of R&D activities (promotion of research at medical institutions)	Research expenditure of medical institutions (local public and private)	Q6
(Research exchange)	Joint research expenditure with national research institutes	Q10
	Research exchange expenditure for efforts among industrial, academic and governmental circles (other than ordinary expenditure)	Q14
	Science and technology information presenting system expenditure	Q16
	Private research exchange promotion expenditure	Q17
(Invitation of R&D oriented businesses)	R&D oriented business invitation expenditure (A: Activities other than financed activities B: Financed activities)	Q12-A Q12-B
(Raising and support of R&D oriented businesses)	Expenditure for raising R&D oriented businesses and support for technological upgrading (A: Activities other than financed activities B: Financed activities)	Q11-A Q11-B
	Expenditure for technological consultation and guidance for local businesses	Q13
	Public invitation type R&D promotion expenditure	Q15
Raising competent R&D staff	Expenditure for raising competent R&D staff by technological training and vocational ability development (A: Private R&D staff B: Prefectural personnel)	Q19-A Q19-B
	Expenditure for raising young researchers (A: Private R&D staff B: Prefectural personnel)	Q20-A Q20-B
Promotion of international exchange	Expenditure for improving the base for international exchange	Q21
	Expenditure for promoting international exchange	Q22
Enlightenment and prevalence promotion of science and technology	Natural science museum expenditure	Q9
	Science and technology education enriching expenditure	Q18
	Science and technology enlightenment and prevalence promotion expenditure	Q23
Efforts for priority research subjects	Expenditure for priority R&D subjects, etc.	Q24

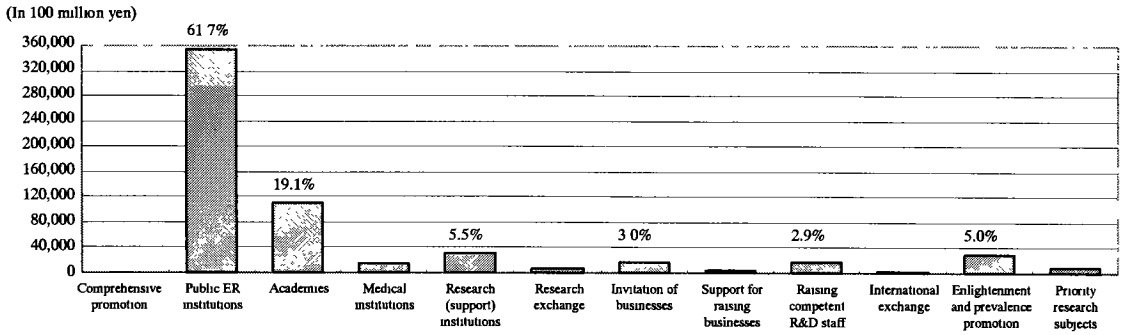
In the case of prefectural governments, the highest percentage was 62% of the regional research institutes, being followed by 19% of academies. These two purposes accounted for more than 80%.

Also in the case of ordinance-designated city governments, the highest percentage was 43% of regional research institutes, being following by 42% of academies as high as the percentage of regional research institutes. These two purposes accounted for 85%.

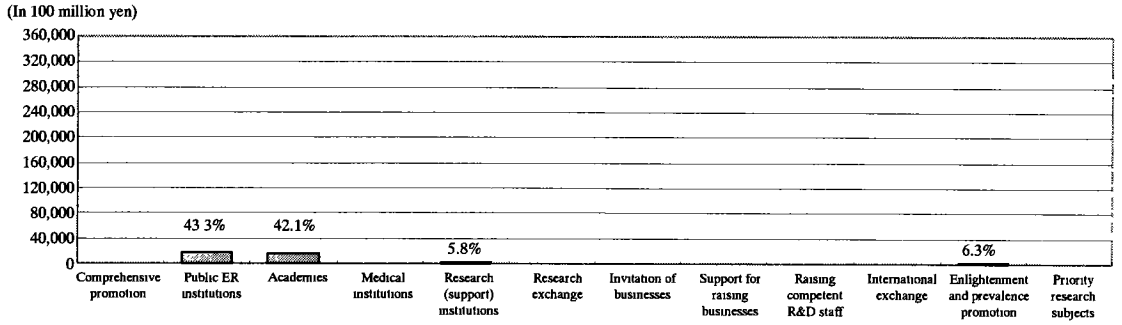
In the total of both prefectural and ordinance-designated municipal governments, the highest percentage was 61% of regional research institutes, being following by 21% of academies. These two purposes accounted for more than 80%. It is noteworthy that the expenditure to R&D institutions and R&D support institutions such as third sectors and juridical foundations accounted for 6%, taking the third place. It was followed by 5% of science and technology enlightenment and prevalence promotion such as natural science museum, and 3% each of invitation of R&D oriented businesses and of competent staff raising by training of private business engineers, etc. in this order.

Fig. 3-2-8 Breakdown of expenditure for science and technology into respective purposes (FY 1992)

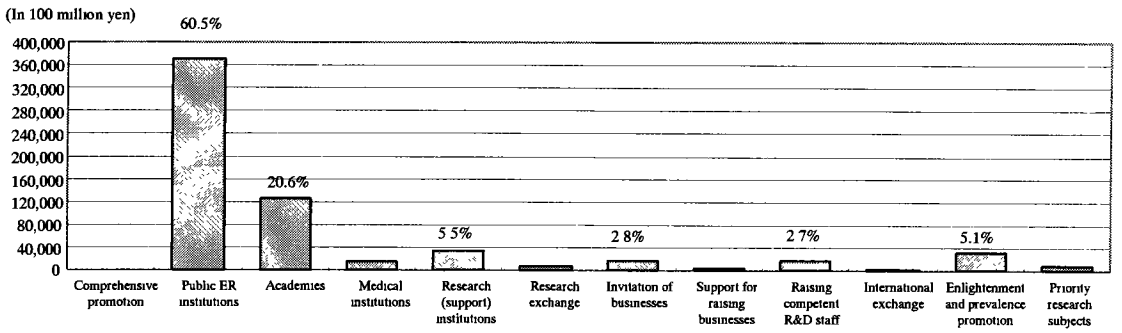
(a) Prefectural governments (total amount: 575,062 million yen)



(b) Ordinance-designated city governments (total amount: 38,912 million yen)



(c) Both prefectural and ordinance-designated city governments (total amount: 613,976 million yen)

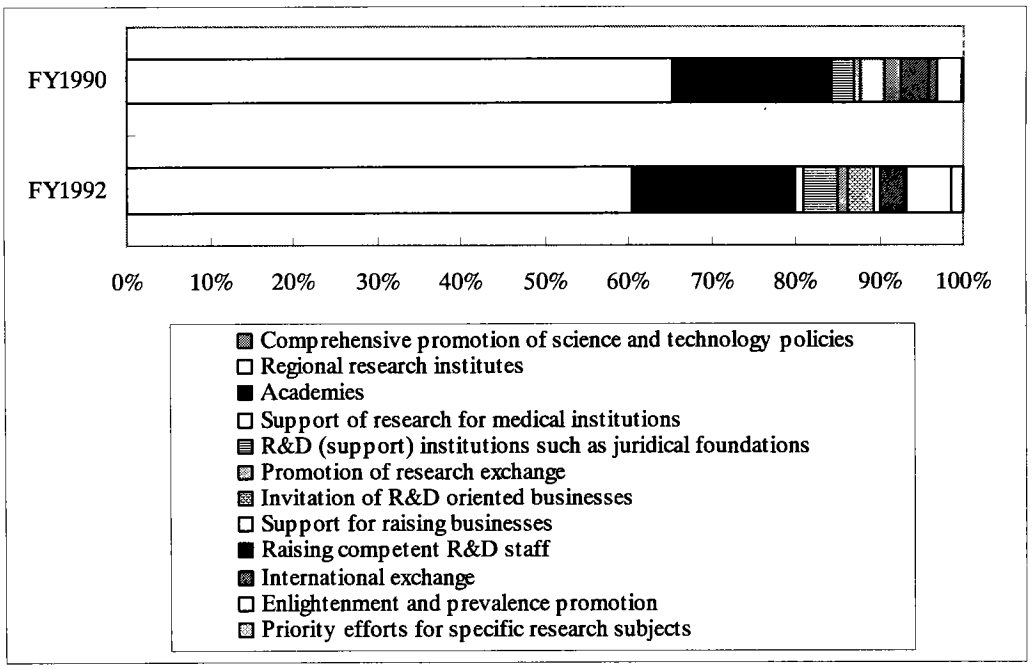


See Table 3-2-10

In comparison with the previous survey for 45 prefectural governments allowing comparison with the previous survey (FT 1990), as shown in Fig. 3-2-9, the regional research institutes purpose with the highest percentage (62%) declined, while the academies (20%), science and technology enlightenment and prevalence promotion (5%) and R&D (support) institutions such as third sectors and juridical foundations (4%) rose respectively in percentage. It is notable that the policies were diversified from those mainly concerned with regional research institutes to various science and research policies.

In the ratios of FY 1992/FY 1991, as shown in Table 3-2-11, the efforts for priority research subjects grew by a factor of more than 10 (123%), and this is attributable to the change of question (that is, the question in FY 1990 was "Expenditure of research for solving technological problems in specific administrative areas", but that in FY 1992 was "Expenditure of especially preferentially challenged R&D"). It was followed by promotion of research at medical institutions (435%), comprehensive promotion of science and technology policies (281%), enlightenment and prevalence promotion (204%), R&D (support) institutions such as third sectors and juridical foundations (182%) in this order, respectively higher than the entire growth rate of 118%. These growth rates are higher than 108% of regional research institutes and 122% of academies, respectively major purposes in the expenditure for science and technology, and their trends must be noted also for identifying the future directions of science and technology policies.

Fig. 3-2-9 Comparison in the breakdown of expenditure for science and technology into purposes of 45 prefectural governments between FY 1990 and FY 1992
(excluding Tokyo Metropolis, Nagasaki Prefecture and Ordinance-designated cities)



See Table 3-2-11.

Table 3-2-10 Breakdown of expenditure for science and technology into respective purposes (FY 1992)

Purpose	47 prefectures governments		12 ordinance-designated city governments		Total	
	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage
Comprehensive promotion of science and technology policies	534	0.1%	0	0.0%	534	0.1%
Regional research institutes	354,803	61.7%	16,869	43.3%	371,671	60.5%
Academies	109,848	19.1%	16,383	42.1%	126,231	20.6%
Promotion of research at medical institutions	14,876	2.6%	146	0.4%	15,022	2.4%
R&D (support) institutions such as juridical foundations	31,484	5.5%	2,250	5.8%	33,734	5.5%
Promotion of research exchange	6,334	1.1%	64	0.2%	6,399	1.0%
Invitation of R&D oriented businesses	17,173	3.0%	321	0.8%	17,494	2.8%
Support for raising businesses	4,483	0.8%	262	0.7%	4,745	0.8%
Raising competent R&D staff	16,690	2.9%	141	0.4%	16,831	2.7%
Promotion of international exchange	1,185	0.2%	87	0.2%	1,271	0.2%
Enlightenment and prevalence promotion	28,545	5.0%	2,470	6.3%	31,015	5.1%
Priority efforts for specific research subjects	8,008	1.4%	92	0.2%	8,100	1.3%
Total expenditure	575,062	100.0%	38,914	100.0%	613,976	100.0%

Note: Because of double counting, each total amount of expenditure does not agree with the calculated total.

Table 3-2-11 Comparison in the breakdown of expenditure for science and technology into respective purposes of 45 prefectural governments between FY 1990 and FY 1992 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated city governments)

Purpose	47 prefectures governments		12 ordinance-designated city governments		FY1992/ FY1990
	Expenditure for science and technology (in one million yen)	Percentage	Expenditure for science and technology (in one million yen)	Percentage	
Comprehensive promotion of science and technology policies	190	0.0%	534	0.1%	281.3%
Regional research institutes	303,883	67.3%	329,094	61.6%	108.3%
Academies	86,935	19.3%	105,615	19.8%	121.5%
Promotion of research at medical institutions	1,316	0.3%	5,720	1.1%	434.6%
R&D (support) institutions such as juridical foundations	12,025	2.7%	21,878	4.1%	181.9%
Promotion of research exchange	4,072	0.9%	6,275	1.2%	154.1%
Invitation of R&D oriented businesses	13,108	2.9%	16,723	3.1%	127.6%
Support for raising businesses	8,914	2.0%	4,295	0.8%	48.2%
Raising competent R&D staff	15,579	3.5%	16,482	3.1%	105.8%
Promotion of international exchange	4,593	1.0%	1,120	0.2%	24.4%
Enlightenment and prevalence promotion	13,857	3.1%	28,282	5.3%	204.1%
Priority efforts for specific research subjects	649	0.1%	8,003	1.5%	1232.9%
Total expenditure	451,391	100.0%	534,278	100.0%	118.4%

Note: Because of double counting, each total amount of expenditure does not agree with the calculated total.

(5) Expenditure of national government for regional science and technology

The national government's total amount of budget for science and technology in FY 1992 was about 2,134,700 million yen as described before (Fig. 3-2-1), and the projects for regional promotion of science and technology were implemented under the budget by Science and Technology Agency, Ministry of Education, Ministry of International Trade and Industry, Ministry of Agriculture, Forestry and Fisheries, etc. The expenditure which could be identified as that for regional promotion of science and technology was about 6,100 million yen (stated in Table 3-2-12 on the next two pages). Of the national government's budget for science and technology, the subsidies, contract money, etc. granted to prefectural and ordinance-designated city governments amounted to about 45,200 million yen, accounting for 2.1% of the national government's total expenditure for science and technology of about 2,134,700 million yen (Table 3-2-13). Anyway, the percentage of the expenditure for regional science and technology in the national government's total expenditure for science and technology was very small.

Table 3-2-13 Subsidies, etc. granted from the national government's budget for science and technology to prefectural and ordinance-designated city governments

(In one million yen)

Ministry or Agency	Subsidy, etc.
Science and Technology Agency	13,955
Environment Agency	450
Ministry of Education	3,165
Ministry of Health and Welfare	20,104
Ministry of Agriculture, Forestry and Fisheries	3,884
Ministry of International Trade and Industry	3,666
Total (a)	45,224
(a)/(b)	2,12%
Total amount of national government's budget for science and technology (b)	2,134,676

Note: Subsidies, etc. include subsidies, contract money, grants, burden charges, etc.

Sources: Calculated from Expenditure for Science and Technology in FY 1992 Budget (Science and Technology Policy Bureau, Science and Technology Agency), FY 1992 Subsidy Pandects (General Affairs Division, Budget Bureau, Ministry of Finance), Outline of Subsidies to Local Authorities in FY 1992 (Ministry of Home Affairs), Outline of Aids for Experiment and Research for Agriculture, FY 1992 Edition (Promotion Section, Secretariat, Agriculture, Forestry and Fisheries Research Council), etc. and hearings.

Table 3-2-12 National government's expenditure for regional science and technology

(In one million yen)

Item of Recommendation No. 18	Measures	FY 1992 budget
1. Improvement of regional R&D environment, etc.		
	o Enrichment of urban functions for R&D in respective regions • Establishment of Law for Promoting the Construction of Kansai Cultural and Scientific Research Urban Area (promulgated in June, 1987) • Decision of basic policies for construction (decided by Prime Minister in September, 1987) • Approval of construction plans (the respective construction plans of Kyoto, Osaka and Nara Prefectures were approved by Prime Minister) • Aid actions, etc. • Investigation on the measures to promote the construction of Kansai cultural and scientific research urban area (National Land Agency) It is intended to construct an urban area where advanced culture, science and research functions are highly integrated, by utilizing the science and technology, etc. accumulated in Kinki District, and investigation started from FY 1979.	
	o Science and technology promotion projects for prefectures where special electric power facilities exist (Science and Technology Agency) It is intended to support the projects for improving the foundations for promoting science and technology in the prefectures where the R&D and nuclear facilities of Japan Atomic Energy Research Institute and Power Reactor and Nuclear Fuel Development Corporation exist.	600
(1) Formulation of comprehensive science and technology policies in respective regions and support for intensifying science and technology promotion functions.		
	o Holding regional science and technology policy meetings, etc. (Council for Science and Technology) Regional science and technology policy meetings and regional science and technology policy forums are held for the purpose of contributing to the planning of science and technology policies in respective regions.	
	o Holding regional science and technology administration liaison meetings To smoothly promote science and technology administration in respective regions, information and opinions are exchanged on the policies and efforts for regional promotion of science and technology, for keeping liaison between Science and Technology Agency and prefectural governments and among the respective prefectural governments.	
	o Telecommunication research parks It is intended to improve base facilities for effectively promoting the R&D concerning telecommunication technologies in respective regions based on Private Business Utilization Law (Ministry of Posts and Telecommunications)	
(2) Support for regional efforts to activate local public experiment and research institutions, intensifying R&D functions and raising youth		
	o Promotion of regional research exchange promotion activities (Science and Technology Agency) It is intended to construct research information networks in respective regions for upgrading the R&D organizations in respective regions by utilizing the R&D potentials in respective regions to the maximum extent, and to promote information exchange, industrialization of new technologies, etc. with such networks as nuclei.	586
	o Regional collaborative R&D activities The national government conducts R&D in cooperation with local authorities on the technological subjects required in respective regions to regionally develop ocean science and technology for promotion of comprehensive ocean utilization.	104
	o Research interchange with local public experiment and research institutions (Ministry of Finance) Information exchange, guidance and acceptance of researchers, etc.	
	o Opening of social education lectures concerning science and technology in public halls, etc. (Ministry of Education)	
	o Improvement and promotion of lifelong learning information presentation systems in respective prefectural governments (Ministry of Education)	
	o Improvement of local public natural science museums, etc. (Ministry of Education)	
	o Aids to R&D efforts of prefectural governments (Ministry of Agriculture, Forestry and Fisheries) Necessary aids are granted for important R&D for regional promotion.	2,524
	o Contract training program (Ministry of Agriculture, Forestry and Fisheries)	
	o Promotion of Technopolis related facilities (Ministry of International Trade and Industry) Local public experiment and research institution activities, raising venture businesses, etc. are aided by granting industrial re-location subsidies and taking various measures such as regional system technology development activities, etc. for improving the technological levels in Technopolis areas.	

(In one million yen)

Item of Recommendation No. 18	Measures	FY 1992 budget
(3) Regional development of science and technology information network		
	o Promotion of regional research exchange promotion activities (stated before) (Science and Technology Agency) o Installation of a system which allows advanced information transmission and can respond to the construction of dispersed data bases. (Ministry of Agriculture, Forestry and Fisheries)	
(4) Promotion of diverse research exchange with universities, national experiment and research institutions, etc.		
	o Domestic training of research officers Dispatch of researchers and research assistants of national experiment and research institutions to the postgraduate courses and affiliated research institutes of national universities. o Joint research scheme between national universities, etc. and private businesses, etc. (Ministry of Education) o Contract training program (Ministry of Education) Working engineers and researchers of private businesses, are given chances to study at national universities, etc. Numbers of persons trained: 1,099 in FY 1989, 1,172 in FY 1990 and 1,182 in FY 1991 o Joint research scheme between national experiment and research institutions and private businesses, etc. o Promotion of joint research for exchange between governmental and private circles (Ministry of Agriculture, Forestry and Fisheries)	32 102
2. Promotion of R&D in respective regions		
(1) Leading the R&D in the regions where national experiment and research institutions, etc. are sited		
	o Regional development of frontier research systems (Institute of Physical and Chemical Research) o Establishment of joint research center (Ministry of Education) o Respective regional agricultural experiment stations were restructured in FY 1988, for example, by establishing a regional foundation research department at each station, and research exchange department, research technology information department, etc. were established in respective experiment and research institutions in FY 1992 (Ministry of Agriculture, Forestry and Fisheries) o Important regional technology R&D (Ministry of International Trade and Industry) National experiment and research institutions, local public experiment stations, private businesses, etc. conduct joint R&D, etc. in the technological areas closely related to regional socioeconomic needs and in the leading characteristic technological areas capable of utilizing regional R&D potentials. o Regional system technology development activities (Ministry of International Trade and Industry) Under the liaison among the national government, prefectural governments, small and medium-sized businesses, etc., large-scale advanced systems necessary for intensifying the foundation of regional small and medium-sized businesses are developed, to raise and anchor development abilities for large-scale technologies. o Regional technology creation activities (Ministry of International Trade and Industry) The technological seeds of national experiment and research institutions, universities, etc. are utilized by regional industrial, academic and governmental circles, to develop technologies as nuclei for development of new products based on the needs of regional small and medium-sized businesses. o Strategic regional technology formation activities (Ministry of International Trade and Industry) Regional industrial, academic and governmental circles integrally conduct R&D for upgrading the existing technologies of regional small and medium-sized businesses and introducing new technologies relating to the existing technologies while the regional liaison and complementing relation across plural prefectural governments are intensified, and the achievements are made prevalent by technological training, etc., to promote the formation of technologies in regional small and medium-sized businesses.	517 368 112 337 75
(2) Promotion of R&D in liaison with regions by coordination among universities, national experiment and research institutions, etc.		
	o Life-related and regionally adapted research by utilizing the science and technology promotion and coordination expenditure (Science and Technology Agency) Being guided by regional major organizers, fundamental and leading research utilizing regional characteristics and research contributing to the improvement of quality of life of residents are promoted under organic liaison among intra- and extra-regional research institutions and researchers. o Establishment of joint research center (stated above) (Ministry of Education)	700
Total		6,057

Source: Present Situations of Policies for Promotion of Science and Technology (Science and Technology Policy Bureau, Science and Technology Agency, April, 1993)

Note: Recommendation No. 18 is the recommendation made in response to 18th request for recommendation "General Basic Measures for Science and Technology to Be Taken for the New Century" (Council for Science and Technology, January 25, 1992).

3-3 Regional comparison of expenditure for science and technology

(1) Ordinary expenditure for science and technology

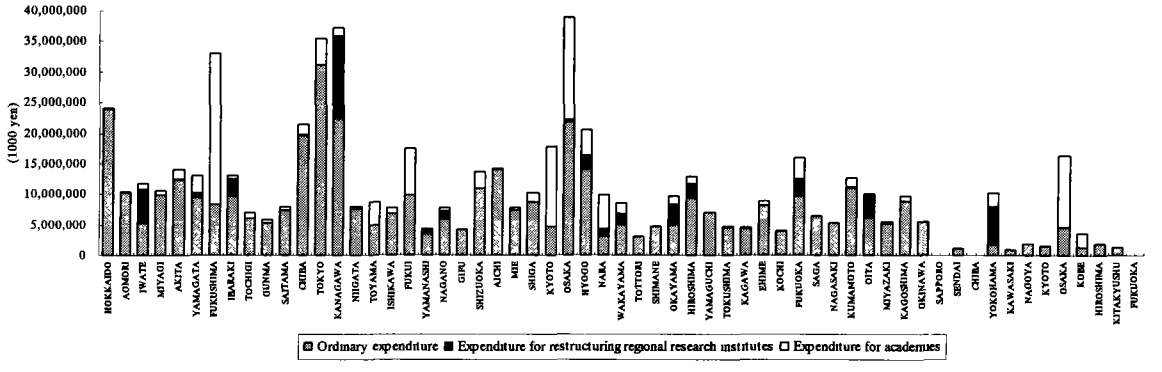
Fig. 3-3-1 shows the total amounts of the expenditure for science and technology spent by prefectural governments and ordinance-related municipal governments. Fig. 3-3-2 shows the total amounts of the expenditure for science and technology spent by prefectural governments (including ordinance-related city governments).

Among the total amounts of the expenditure for science and technology of respective prefectural governments (including ordinance-designated city governments), only four prefectures of Osaka (about 55,300 million yen), Kanagawa (about 48,300 million yen), Tokyo Metropolis (about 35,400 million yen) and Fukushima (about 33,000 million yen) exceeded 30,000 million yen, far higher than Hokkaido (about 24,200 million yen) in the 5th place and other prefectures. The average amount is about 13,100 million yen. The amounts of the respective prefectures range widely from about 55,300 million yen (Osaka) to about 3,000 million yen (Tottori) (Fig. 3-3-2).

Among the restructuring expenditure of local public experiment and research institutions, outstanding are the large amounts of Kanagawa Prefecture (about 19,800 million yen, including Yokohama City) which restructured General Institute of Industrial Technologies (Kanagawa Prefecture) and Biology Research Institute (Yokohama City), and Iwate Prefecture (about 5,600 million yen) which restructured Manufacturing Industry Technology Center and Forestry Technology Center.

Among the expenditure for science and engineering academies, outstanding are the large amounts of Osaka Prefecture (about 28,600 million yen), Fukushima Prefecture (about 24,800 million yen) and Kyoto Prefecture (about 13,000 million yen). The large amount of Osaka Prefecture (including Osaka City) is due to the expenditure for Osaka Prefecture University and Osaka city University, the large amount of Fukushima Prefecture, the expenditure for Fukushima Medical College and the expenditure for establishing the University of Aizu, and the large amount of Kyoto Prefecture, the expenditure for Kyoto Prefectural University of Medicine, etc.

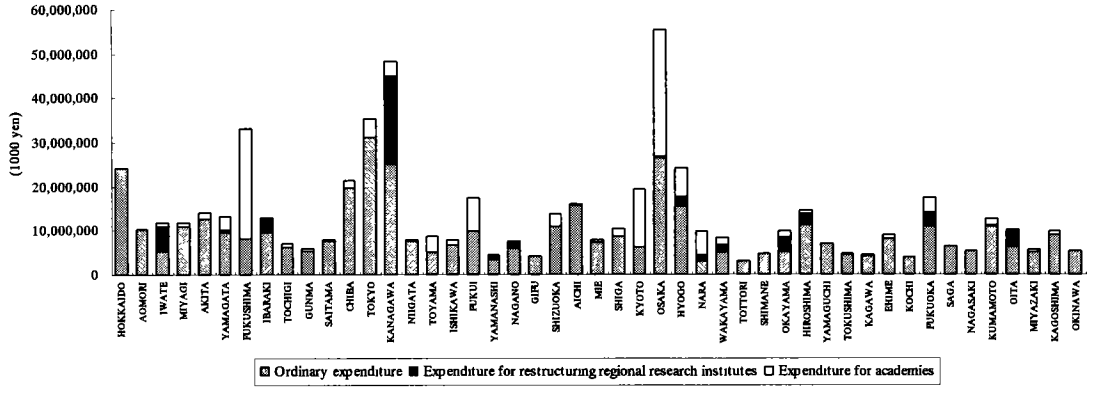
Fig. 3-3-1 Expenditure for science and technology spent by prefectural governments and ordinance-designated city governments (FY 1992)



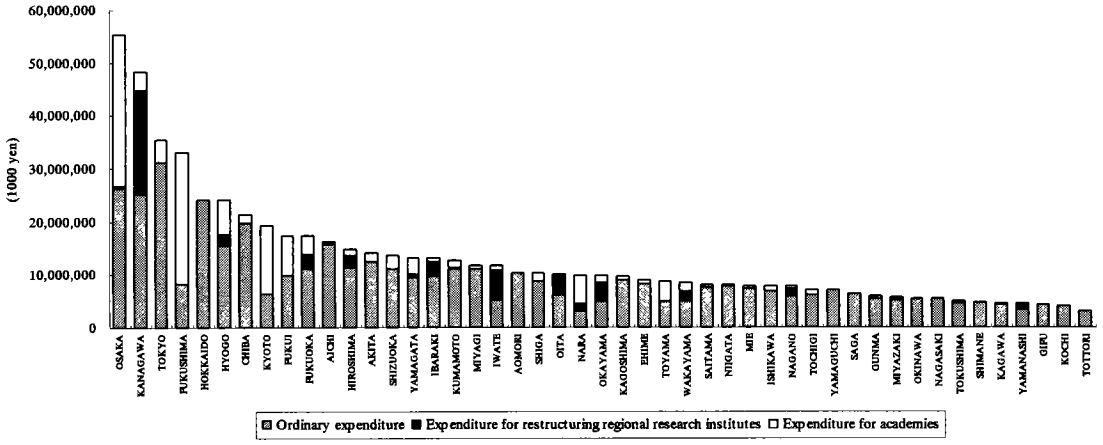
See Table 3-3-1

Fig. 3-3-2 Expenditure for science and technology spent by prefectural governments (including ordinance-designated city governments) (FY 1992)

(1) In the order of prefectural governments



(2) In the order of amounts of money



See Table 3-3-1.

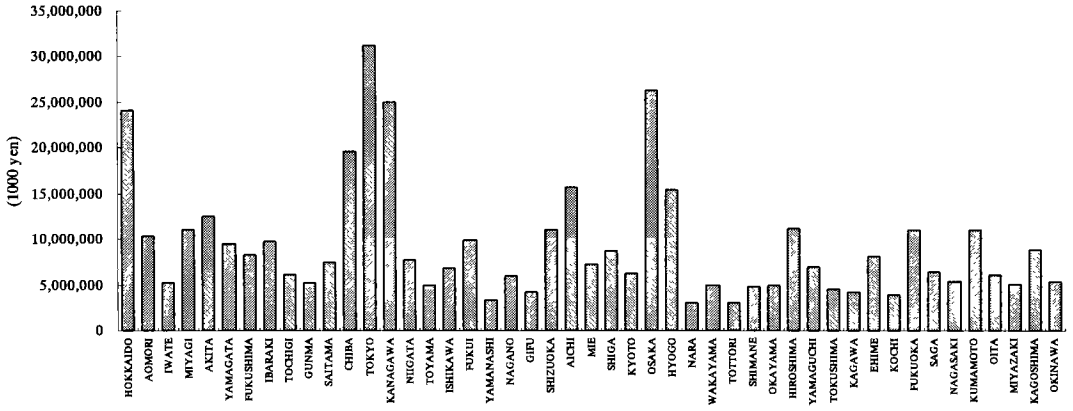
In the expenditure for science and technology, as in the previous survey (results of FY 1990), the expenditure obtained by subtracting "expenditure for restructuring regional research institutes" considered to be different from year to year and "expenditure for institutions of higher education for science and engineering" considered to be greatly different from region to region is defined as "ordinary expenditure for science and technology".

As for the ordinary expenditure for science and technology, the average of prefectures was about 9,000 million yen, and that of ordinance-designated cities, about 1,300 million yen. The median of prefectures was about 7,300 million yen (corresponding to the amount of Mie Prefecture), and that of ordinance-designated cities, about 1,400 million yen (corresponding to the average of Kobe City and Kitakyushu City). With regard to the amounts of respective prefectures and respective ordinance-designated cities, they ranged very widely from about 3,000 million yen (Nara Prefecture) to about 31,200 million yen (Tokyo Metropolis) among prefectures, and from about 300 million yen (Fukuoka City) excluding 700,000 yen of Chiba City only recently designated as an ordinance-designated city (April 1, 1992) to about 4,400 million yen (Osaka City) among ordinance-designated cities (Table 3-3-1).

As for the ordinary expenditure for science and technology spent by respective prefectural governments (including ordinance-designated city governments), the average was about 9,300 million yen. The prefectures large in the ordinary expenditure were Tokyo Metropolis (about 31,200 million yen), Osaka Prefecture (about 26,300 million yen), Kanagawa Prefecture (about 25,000 million yen), Hokkaido (about 24,000 million yen) and Chiba Prefecture (about 19,600 million yen) in this order (Fig. 3-3-3).

Fig. 3-3-3 Ordinary expenditure for science and technology spent by prefectural governments (including ordinance-designated city governments) (FY 1992)

(1) In the order of prefectural governments



(2) In the order of amounts of money

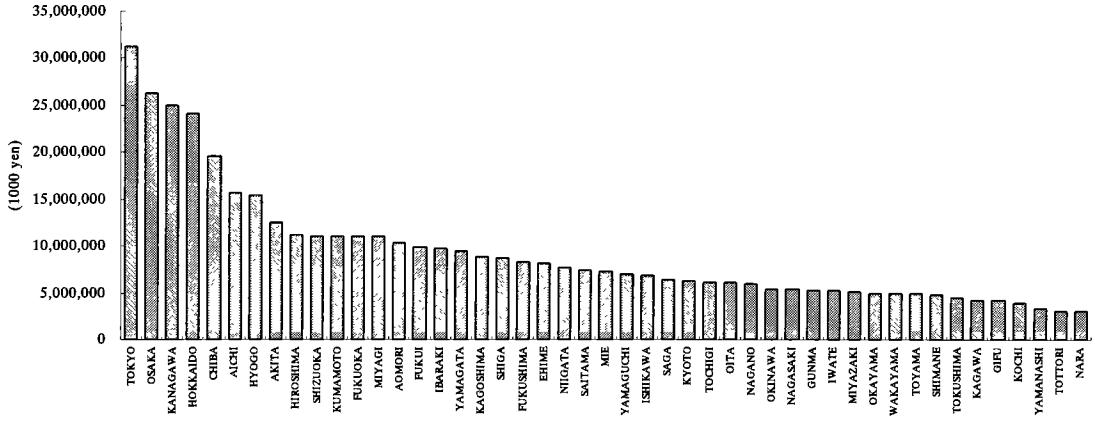
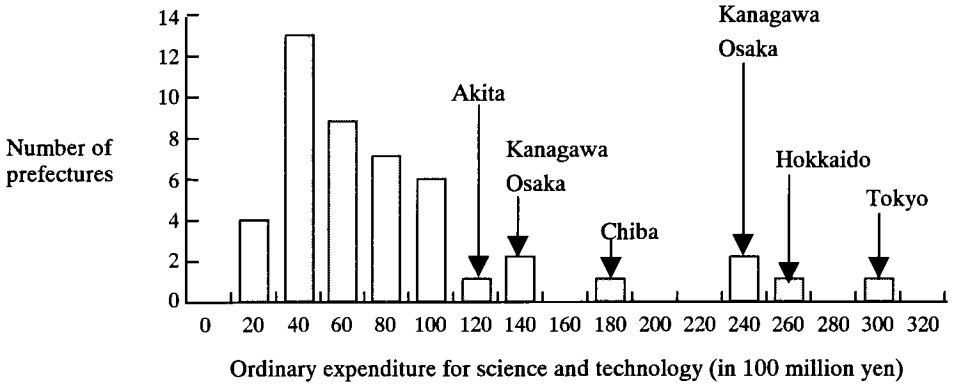


Fig. 3-3-4 shows a histogram of ordinary expenditure for science and technology of respective prefectures (including ordinance-designated cities) in 2,000 million yen steps. The number of prefectures belonging to "4,000 million yen to less than 6,000 million yen" was the largest 14, being followed by 9 belonging to "6,000 million yen to less than 8,000 million yen" and 7 belonging to "8,000 million to less than 10,000 million yen". Four prefectures of Tokyo, Hokkaido, Kanagawa and Osaka were very larger than the other prefectures.

Fig. 3-3-4 Distribution of ordinary expenditure for science and technology among respective prefectures (including ordinance-designated cities) (FY 1992)

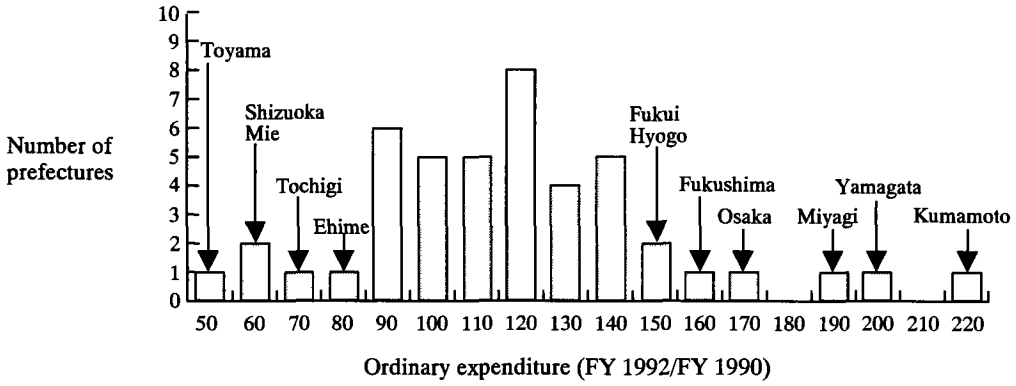


See Table 3-3-1.

Fig. 3-3-5 is a histogram showing the percentages of ordinary expenditure for science and technology of comparable 45 prefectural governments in FY 1992 to that in FY 1990 in 10% steps. The number of prefectures belonging to "120% to less than 130%" was the largest 8, being followed by 6 belonging to "90% to less than 100%", and 5 each of "100% to less than 110%", "110% to less than 120%" and "140% to less than 150%". High growth rates of Miyagi Prefecture (196%), Yamagata Prefecture (203%) and Kumamoto Prefecture (226%) are remarkable compared to the other prefectures. It can be seen from the ordinary expenditure for science and technology that the efforts of respective prefectural governments became different between FY 1990 and FY 1992.

Fig. 3-3-6 shows cumulative percentages of expenditure of the prefectural governments in FY 1990 and FY 1992 arranged in the declining order of percentage. From the diagrams, it can be seen that the order of respective prefectural governments is greatly different between FY 1990 and FY 1992 due to the difference in the efforts of respective prefectural governments as described above (for example, Kumamoto Prefecture from 28th place to 10th place, Yamagata Prefecture from 30th place to 16th place, Miyagi Prefecture from 26th place to 13th place in (1) and (2) of Fig. 3-3-6), though the macroscopic difference between both the years was not large (Fig. 3-3-6(3)). However, since the difference in the total amount of expenditure for science and technology looks to have widened (Fig. 3-3-7), and since the efforts among respective prefectural governments became different, it can also be estimated that the difference will be kept widened, and it is necessary to pay attention to future trends. Also for this reason, it is important to continuously collect and compile data on the regional expenditure for science and technology.

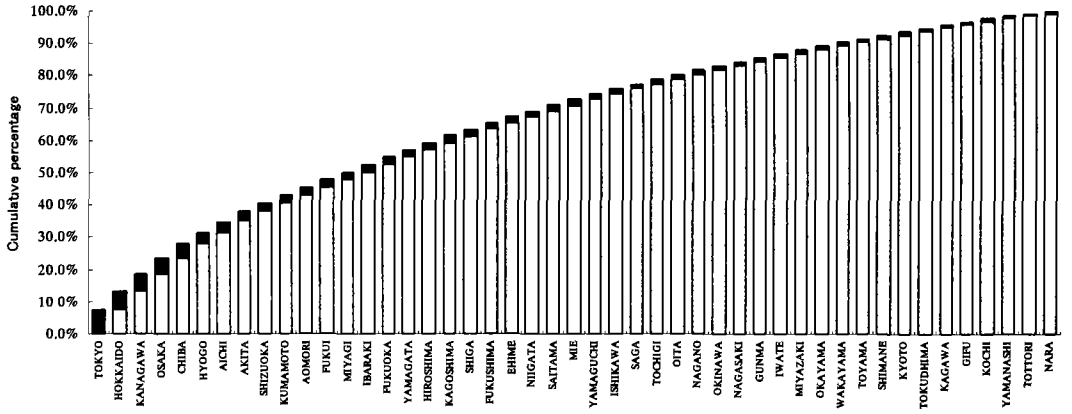
Fig. 3-3-5 Ratios of ordinary expenditure for science and technology of 45 prefectural governments in FY 1992 to that in FY 1990
(excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)



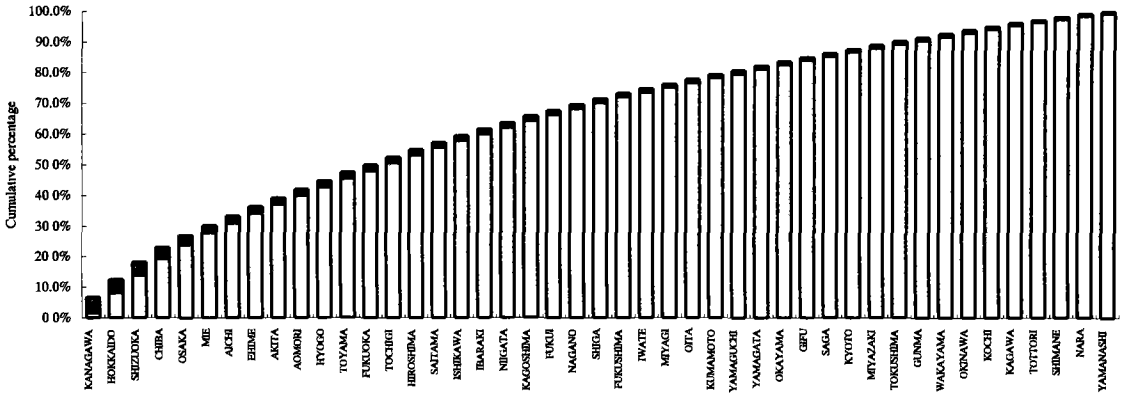
See Table 3-3-2.

Fig. 3-3-6 Cumulative percentages of ordinary expenditure for science and technology spent by prefectural governments

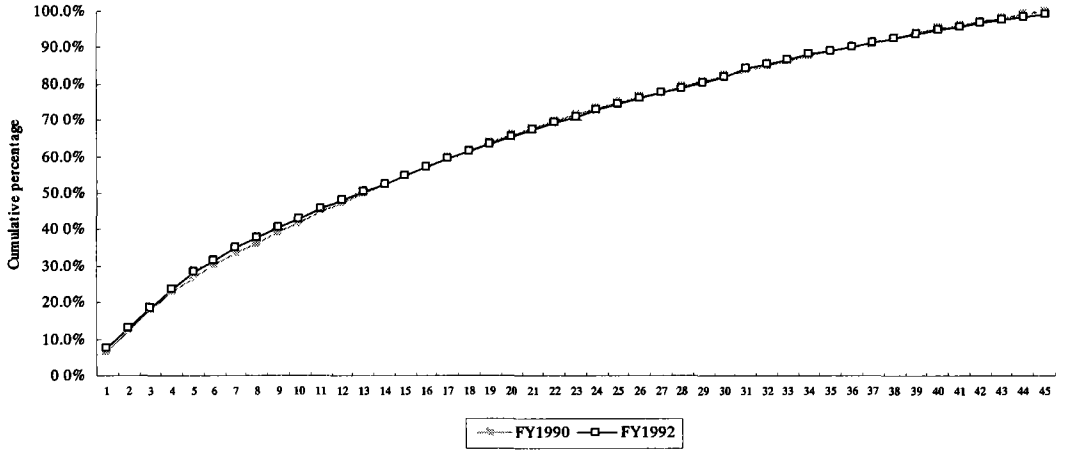
(1) FY 1992 (excluding ordinance-designated cities)



(2) FY 1990 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)

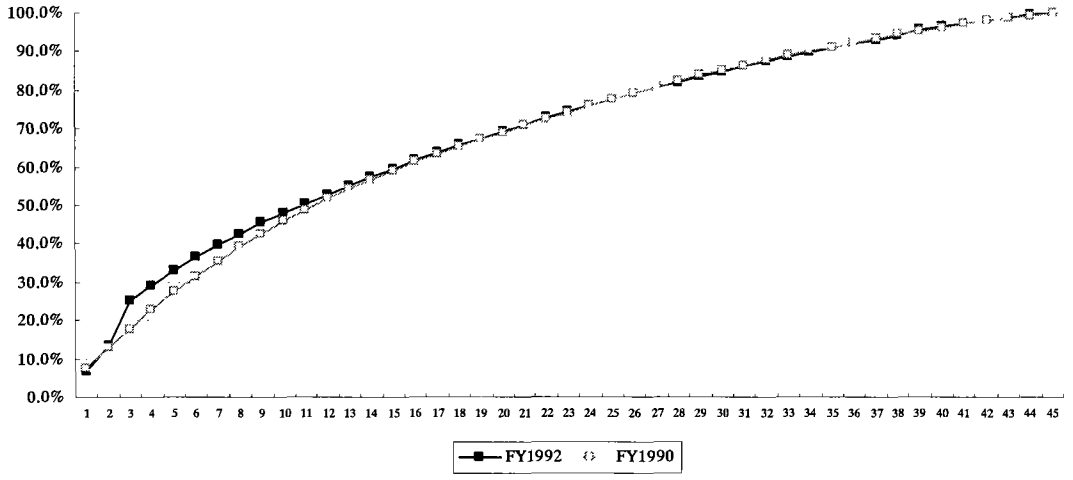


(3) Comparison between FY 1990 and FY 1992 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)



See Table 3-3-3.

Fig. 3-3-7 Cumulative percentages of total amounts of expenditure for science and technology spent by prefectural governments
(comparison between FY 1990 and FY 1992, excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)



See Table 3-3-4.

Table 3-3-1 Expenditure for science and technology spent by respective prefectural governments and ordinance-designated city governments (FY 1992)

(In 1,000 yen)

Prefecture	Ordinary expenditure	Expenditure for restructuring regional research institutes	Expenditure for institutions of higher education	Total amount
Hokkaido	23,974,433	64,839	44,960	24,084,232
Aomori	10,250,141	98,053	0	10,348,194
Iwate	5,231,265	5,623,098	832,827	11,687,190
Miyagi	9,846,568	6,500	708,889	10,561,957
Akita	12,479,153	38,390	1,456,565	13,974,108
Yamagata	9,414,345	749,083	2,982,664	13,146,092
Fukushima	8,262,667	1,400	24,763,825	33,027,892
Ibaraki	9,659,249	2,818,433	532,506	13,010,188
Tochigi	6,071,990	51,926	945,810	7,069,726
Gunma	5,275,765	2,431	626,290	5,904,486
Saitama	7,451,969	6,964	514,767	7,973,700
Chiba	19,580,346	70,563	1,676,193	21,327,102
Tokyo	31,179,273	0	4,232,785	35,412,058
Kanagawa	22,445,203	13,455,107	1,320,795	37,221,105
Niigata	7,662,707	0	305,338	7,968,045
Toyama	4,914,442	0	3,754,481	8,668,923
Ishikawa	6,803,650	0	991,294	7,794,944
Fukui	9,896,196	0	7,515,627	17,411,823
Yamanashi	3,383,199	738,829	232,676	4,354,704
Nagano	5,920,538	1,283,160	475,151	7,678,849
Gifu	4,161,107	0	0	4,161,107
Shizuoka	11,042,298	26,603	2,586,919	13,655,820
Aichi	13,936,321	168,542	162,000	14,266,863
Mie	7,324,254	7,220	508,337	7,839,811
Shiga	8,668,173	22,373	1,594,877	10,285,423
Kyoto	4,777,389	0	12,954,978	17,732,367
Osaka	21,813,486	380,131	16,756,635	38,950,252
Hyogo	14,083,550	2,244,464	4,142,426	20,470,440
Nara	2,997,042	1,356,604	5,534,403	9,888,049
Wakayama	4,959,764	1,850,370	1,738,409	8,548,543
Tottori	3,008,126	500	0	3,008,626
Shimane	4,777,948	0	0	4,777,948
Okayama	4,995,993	3,421,394	1,329,836	9,747,223
Hiroshima	9,289,973	2,555,930	952,899	12,798,802
Yamaguchi	6,985,216	0	0	6,985,216
Tokushima	4,493,739	0	333,218	4,826,957
Kagawa	4,272,358	0	263,186	4,535,544
Ehime	8,110,460	0	862,574	8,973,034
Kochi	3,908,243	17,762	0	3,926,005
Fukuoka	9,582,489	2,892,154	3,480,061	15,954,704
Saga	6,361,233	0	0	6,361,233
Nagasaki	5,349,741	22,916	0	5,372,657
Kumamoto	11,004,847	159,616	1,457,079	12,621,542
Oita	6,053,295	3,939,522	1,500	9,994,317
Miyazaki	5,118,137	265	470,285	5,588,687
Kagoshima	8,884,475	30,189	805,183	9,719,847
Okinawa	5,438,867	7,169	0	5,446,036
Total of prefectures	421,101,623	44,112,500	109,848,248	575,062,371
Mean	8,959,609	938,564	2,337,197	12,235,370
Median	7,324,254	22,916	805,183	9,747,223

Table 3-3-1 (continued)

Ordinance-designated city	Ordinary expenditure	Expenditure for restructuring regional research institutes	Expenditure for institutions of higher education	Total amount
Sapporo	72,331	0	0	72,331
Sendai	1,126,959	0	0	1,126,959
Chiba	658	0	0	658
Yokohama	1,665,942	6,379,823	2,102,365	10,148,130
Kawasaki	924,850	10,000	0	934,850
Nagoya	1,820,305	0	0	1,820,305
Kyoto	1,465,630	0	79,089	1,544,719
Osaka	4,480,423	0	11,842,582	16,323,005
Kobe	1,314,334	0	2,359,035	3,673,369
Hiroshima	1,853,061	0	0	1,853,061
Kitakyushu	1,388,497	0	0	1,388,497
Fukuoka	27,884	0	0	27,884
Total of ordinance-designated cities	16,140,874	6,389,823	16,383,071	38,913,768
Mean	1,345,073	532,485	1,365,256	3,242,814
Median	1,351,416	0	0	1,466,608
Total of prefectures and ordinance-designated cities	437,242,497	50,502,323	126,231,319	613,976,139

Table 3-3-2 Comparison in ordinary expenditure for science and technology spent by 45 prefectural governments between FY 1990 and FY 1992 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)

Name of prefecture	FY 1990 (in 1000 yen)	FY 1992 (in 1000 yen)	FY 1992/ FY 1990 (%)
Hokkaido	18,524,113	23,974,433	129.4%
Aomori	8,942,688	10,250,141	114.6%
Iwate	5,089,880	5,231,265	102.8%
Miyagi	5,029,902	9,846,568	195.8%
Akita	8,962,708	12,479,153	139.2%
Yamagata	4,649,704	9,414,345	202.5%
Fukushima	5,121,421	8,262,667	161.3%
Ibaraki	6,852,392	9,659,249	141.0%
Tochigi	8,015,645	6,071,990	75.8%
Gunma	4,074,719	5,275,765	129.5%
Saitama	7,413,845	7,451,969	100.5%
Chiba	15,269,346	19,580,346	128.2%
Tokyo	—	—	—
Kanagawa	21,494,283	22,445,203	104.4%
Niigata	6,814,576	7,662,707	112.4%
Toyama	8,754,182	4,914,442	56.1%
Ishikawa	6,945,780	6,803,650	98.0%
Fukui	6,350,077	9,896,196	155.8%
Yamanashi	2,684,922	3,383,199	126.0%
Nagano	6,281,114	5,920,538	94.3%
Gifu	4,352,814	4,161,107	95.6%
Shizuoka	18,228,471	11,042,298	60.6%
Aichi	10,180,513	13,936,321	136.9%
Mie	10,966,789	7,324,254	66.8%
Shiga	6,122,022	8,668,173	141.6%
Kyoto	4,188,610	4,777,389	114.1%
Osaka	12,750,594	21,813,486	171.1%
Hyogo	8,903,148	14,083,550	158.2%
Nara	3,029,894	2,997,042	98.9%
Wakayama	4,061,539	4,959,764	122.1%
Tottori	3,328,213	3,008,126	90.4%
Shimane	3,268,101	4,777,948	146.2%
Okayama	4,642,086	4,995,993	107.6%
Hiroshima	7,980,607	9,289,973	116.4%
Yamaguchi	4,777,642	6,985,216	146.2%
Tokushima	4,091,313	4,493,739	109.8%
Kagawa	3,340,456	4,272,358	127.9%
Ehime	9,868,870	8,110,460	82.2%
Kochi	3,921,830	3,908,243	99.7%
Fukuoka	8,021,739	9,582,489	119.5%
Saga	4,336,786	6,361,233	146.7%
Nagasaki	—	—	—
Kumamoto	4,866,711	11,004,847	226.1%
Oita	4,927,421	6,053,295	122.8%
Miyazaki	4,123,447	5,118,137	124.1%
Kagoshima	6,770,576	8,884,475	131.2%
Okinawa	3,994,036	5,438,867	136.2%
Total of prefectures	322,315,525	384,572,609	119.3%
Mean	7,162,567	8,546,058	119.3%
Median	6,122,022	7,324,254	119.6%

Table 3-3-3 Order of prefectures in the ordinary expenditure for science and technology and cumulative percentages (FY 1992 and FY 1990)

FY 1992				Cumulative %	FY 1990				Cumulative %
No	Name of prefecture	In one million yen	Cumulative amount	FY 1992	No	Name of prefecture	In one million yen	Cumulative amount	FY 1990
1	Tokyo	31,179	31,179	7.4%	1	Kanagawa	21,494	21,494	6.7%
2	Hokkaido	23,974	55,153	13.1%	2	Hokkaido	18,524	40,018	12.4%
3	Kanagawa	22,445	77,599	18.4%	3	Shizuoka	18,228	58,247	18.1%
4	Osaka	21,813	99,412	23.6%	4	Chiba	15,269	73,516	22.8%
5	Chiba	19,580	118,992	28.3%	5	Osaka	12,751	86,267	26.8%
6	Hyogo	14,084	133,076	31.6%	6	Mie	10,967	97,234	30.2%
7	Aichi	13,936	147,012	34.9%	7	Aichi	10,181	107,414	33.3%
8	Akita	12,479	159,491	37.9%	8	Ehime	9,869	117,283	36.4%
9	Shizuoka	11,042	170,534	40.5%	9	Akita	8,963	126,246	39.2%
10	Kumamoto	11,005	181,539	43.1%	10	Aomori	8,943	135,188	41.9%
11	Aomori	10,250	191,789	45.5%	11	Hyogo	8,903	144,092	44.7%
12	Fukui	9,896	201,685	47.9%	12	Toyama	8,754	152,846	47.4%
13	Miyagi	9,847	211,532	50.2%	13	Fukuoka	8,022	160,867	49.9%
14	Ibaraki	9,659	221,191	52.5%	14	Tochigi	8,016	168,883	52.4%
15	Fukuoka	9,582	230,773	54.8%	15	Hiroshima	7,981	176,864	54.9%
16	Yamagata	9,414	240,188	57.0%	16	Saitama	7,414	184,278	57.2%
17	Hiroshima	9,290	249,478	59.2%	17	Ishikawa	6,946	191,223	59.3%
18	Kagoshima	8,884	258,362	61.4%	18	Ibaraki	6,852	198,076	61.5%
19	Shiga	8,668	267,030	63.4%	19	Niigata	6,815	204,890	63.6%
20	Fukushima	8,263	275,293	65.4%	20	Kagoshima	6,771	211,661	65.7%
21	Ehime	8,110	283,403	67.3%	21	Fukui	6,350	218,011	67.6%
22	Niigata	7,663	291,066	69.1%	22	Nagano	6,281	224,292	69.6%
23	Saitama	7,452	298,518	70.9%	23	Shiga	6,122	230,414	71.5%
24	Mie	7,324	305,842	72.6%	24	Fukushima	5,121	235,535	73.1%
25	Yamaguchi	6,985	312,828	74.3%	25	Iwate	5,090	240,625	74.7%
26	Ishikawa	6,804	319,631	75.9%	26	Miyagi	5,030	245,655	76.2%
27	Saga	6,361	325,992	77.4%	27	Oita	4,927	250,583	77.7%
28	Tochigi	6,072	332,064	78.9%	28	Kumamoto	4,867	255,449	79.3%
29	Oita	6,053	338,118	80.3%	29	Yamaguchi	4,778	260,227	80.7%
30	Nagano	5,921	344,038	81.7%	30	Yamagata	4,650	264,877	82.2%
31	Okinawa	5,439	349,477	83.0%	31	Okayama	4,642	269,519	83.6%
32	Nagasaki	5,350	354,827	84.3%	32	Gifu	4,353	273,872	85.0%
33	Gunma	5,276	360,103	85.5%	33	Saga	4,337	278,208	86.3%
34	Iwate	5,231	365,334	86.8%	34	Kyoto	4,189	282,397	87.6%
35	Miyazaki	5,118	370,452	88.0%	35	Miyazaki	4,123	286,521	88.9%
36	Okayama	4,996	375,448	89.2%	36	Tokushima	4,091	290,612	90.2%
37	Wakayama	4,960	380,408	90.3%	37	Gunma	4,075	294,687	91.4%
38	Toyama	4,914	385,322	91.5%	38	Wakayama	4,062	298,748	92.7%
39	Shimane	4,778	390,100	92.6%	39	Okinawa	3,994	302,742	93.9%
40	Kyoto	4,777	394,878	93.8%	40	Kochi	3,922	306,664	95.1%
41	Tokushima	4,494	399,372	94.8%	41	Kagawa	3,340	310,004	96.2%
42	Kagawa	4,272	403,644	95.9%	42	Tottori	3,328	313,333	97.2%
43	Gifu	4,161	407,805	96.8%	43	Shimane	3,268	316,601	98.2%
44	Kochi	3,908	411,713	97.8%	44	Nara	3,030	319,631	99.2%
45	Yamanashi	3,383	415,096	98.6%	45	Yamanashi	2,685	322,316	100.0%
46	Tottori	3,008	418,105	99.3%					
47	Nara	2,997	421,102	100.0%					
	Total of prefectures	421,102				Total of prefectures	322,316		

Table 3-3-4 Order of prefectures in the total amount of expenditure for science and technology and cumulative percentages (FY 1992 and FY 1990)

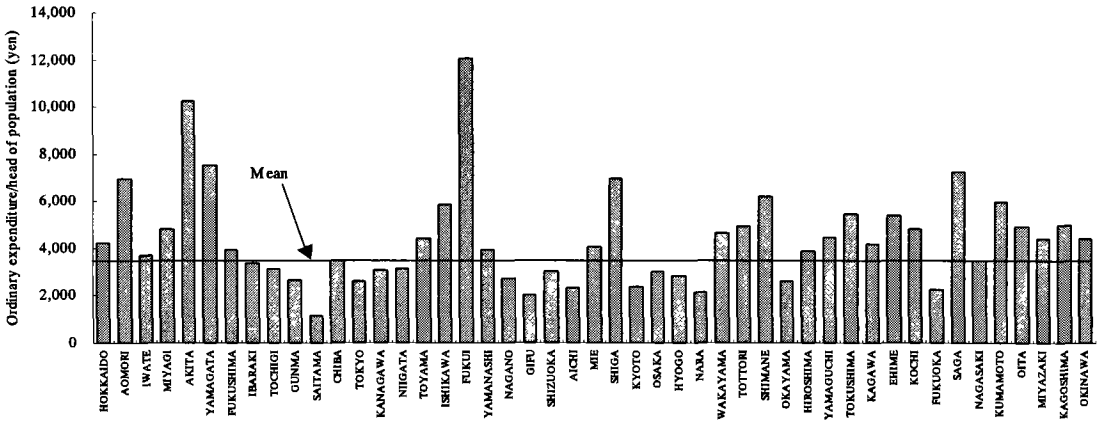
FY 1992				Cumulative %	FY 1990				Cumulative %
No	Name of prefecture	Total amount (in one million yen)	Cumulative amount (in one million yen)	FY 1992	No	Name of prefecture	Total amount (in one million yen)	Cumulative amount (in one million yen)	FY 1990
1	Osaka	38,950	38,950	6.8%	1	Kanagawa	34,173	34,173	7.6%
2	Kanagawa	37,221	76,171	13.2%	2	Osaka	24,843	59,016	13.1%
3	Tokyo	35,412	111,583	19.4%	3	Wakayama	21,853	80,869	17.9%
4	Fukushima	33,028	144,611	25.1%	4	Hokkaido	21,669	102,538	22.7%
5	Hokkaido	24,084	168,696	29.3%	5	Shizuoka	21,000	123,538	27.4%
6	Chiba	21,327	190,023	33.0%	6	Hyogo	19,123	142,662	31.6%
7	Hyogo	20,470	210,493	36.6%	7	Chiba	17,602	160,264	35.5%
8	Kyoto	17,732	228,225	39.7%	8	Fukui	17,523	177,787	39.4%
9	Fukui	17,412	245,637	42.7%	9	Fukushima	14,931	192,717	42.7%
10	Fukuoka	15,955	261,592	45.5%	10	Ehime	14,624	207,342	45.9%
11	Aichi	14,267	275,859	48.0%	11	Hiroshima	13,520	220,862	48.9%
12	Akita	13,974	289,833	50.4%	12	Toyama	12,974	233,836	51.8%
13	Shizuoka	13,656	303,489	52.8%	13	Mie	11,830	245,666	54.4%
14	Yamagata	13,146	316,635	55.1%	14	Fukuoka	10,881	256,547	56.8%
15	Ibaraki	13,010	329,645	57.3%	15	Akita	10,593	267,140	59.2%
16	Hiroshima	12,799	342,444	59.5%	16	Aichi	10,187	277,327	61.4%
17	Kumamoto	12,622	355,065	61.7%	17	Aomori	9,064	286,390	63.4%
18	Iwate	11,687	366,753	63.8%	18	Tochigi	8,647	295,038	65.4%
19	Miyagi	10,562	377,315	65.6%	19	Iwate	8,239	303,277	67.2%
20	Aomori	10,348	387,663	67.4%	20	Ishikawa	7,961	311,237	69.0%
21	Shiga	10,285	397,948	69.2%	21	Kochi	7,938	319,176	70.7%
22	Oita	9,994	407,942	70.9%	22	Shiga	7,784	326,960	72.4%
23	Nara	9,888	417,831	72.7%	23	Nara	7,730	334,690	74.1%
24	Okayama	9,747	427,578	74.4%	24	Ibaraki	7,543	342,233	75.8%
25	Kagoshima	9,720	437,298	76.0%	25	Kagoshima	7,539	349,772	77.5%
26	Ehime	8,973	446,271	77.6%	26	Saitama	7,415	357,188	79.1%
27	Toyama	8,669	454,940	79.1%	27	Tokushima	7,262	364,450	80.7%
28	Wakayama	8,549	463,488	80.6%	28	Niigata	7,176	371,626	82.3%
29	Saitama	7,974	471,462	82.0%	29	Nagano	6,589	378,215	83.8%
30	Niigata	7,968	479,430	83.4%	30	Kumamoto	6,156	384,370	85.2%
31	Mie	7,840	487,270	84.7%	31	Miyagi	5,827	390,197	86.4%
32	Ishikawa	7,795	495,065	86.1%	32	Okayama	5,632	395,829	87.7%
33	Nagano	7,679	502,743	87.4%	33	Kyoto	5,410	401,239	88.9%
34	Tochigi	7,070	509,813	88.7%	34	Yamagata	5,146	406,385	90.0%
35	Yamaguchi	6,985	516,798	89.9%	35	Oita	4,934	411,319	91.1%
36	Saga	6,361	523,160	91.0%	36	Miyazaki	4,832	416,150	92.2%
37	Gunma	5,904	529,064	92.0%	37	Yamaguchi	4,778	420,928	93.3%
38	Miyazaki	5,589	534,653	93.0%	38	Gunma	4,692	425,620	94.3%
39	Okinawa	5,446	540,099	93.9%	39	Gifu	4,434	430,054	95.3%
40	Nagasaki	5,373	545,471	94.9%	40	Saga	4,337	434,391	96.2%
41	Tokushima	4,827	550,298	95.7%	41	Okinawa	3,994	438,385	97.1%
42	Shimane	4,778	555,076	96.5%	42	Kagawa	3,725	442,110	97.9%
43	Kagawa	4,536	559,612	97.3%	43	Tottori	3,328	445,439	98.7%
44	Yamanashi	4,355	563,967	98.1%	44	Shimane	3,268	448,707	99.4%
45	Gifu	4,161	568,128	98.8%	45	Yamanashi	2,685	451,392	100.0%
46	Kochi	3,926	572,054	99.5%	46				
47	Tottori	3,009	575,062	100.0%	47				
	Total	575,062				Total	451,392		

(2) Ordinary expenditure for science and technology per head of population

Fig. 3-3-8 shows the ordinary expenditure for science and technology per head of population spent by respective prefectural governments (including ordinance-designated city governments). The average was about 3,500 yen/person, and the expenditure ranged very widely from about 1,100 yen/person (Saitama Prefecture) to about 12,000 yen/person (Fukui Prefecture). Fukui Prefecture (about 12,000 yen/person) and Akita Prefecture (about 10,000 yen/person) are outstanding, being far larger than about 7,500 yen/person of Yamagata Prefecture taking the 3rd place.

Fig. 3-3-8 Ordinary expenditure for science and technology per head of population spent by prefectural governments (including ordinance-designated city governments) (FY 1992)

(1) In the order of prefectures



(2) In the order of amounts of money

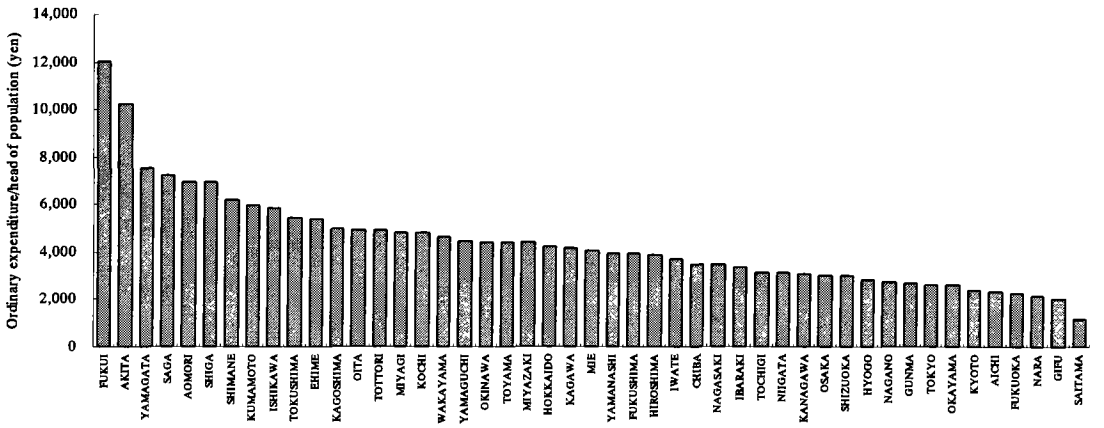
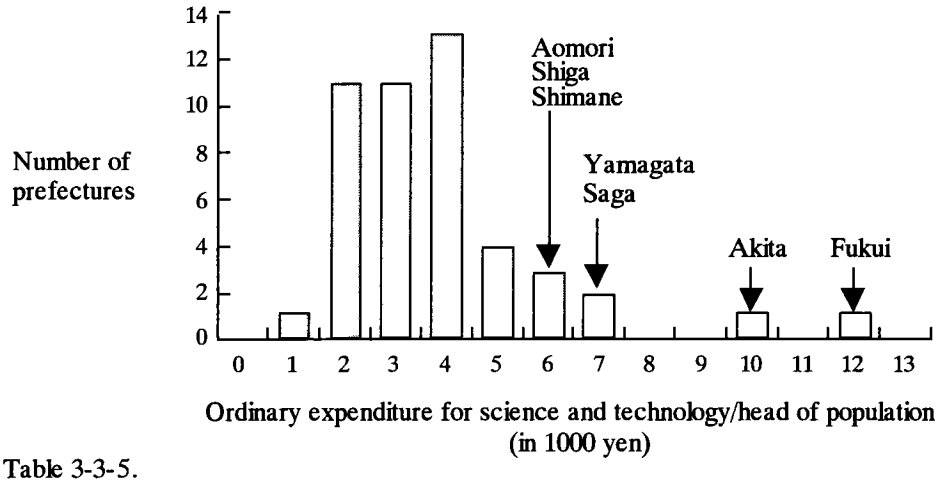


Fig. 3-3-9 is a histogram showing the ordinary expenditure for science and technology per head of population spent by respective prefectural governments (including ordinance-designated city governments) in 1,000 yen steps. The number of prefectures belonging to "4,000 yen to less than 5,000" was 13, and the numbers of prefectures belonging to "2,000 yen to less than 3,000 yen" and "3,000 yen to less than 4,000 yen" were 11 each.

Fig. 3-3-9 Distribution of prefectures (including ordinance-designated cities) in the ordinary expenditure for science and technology per head of population (FY 1992)



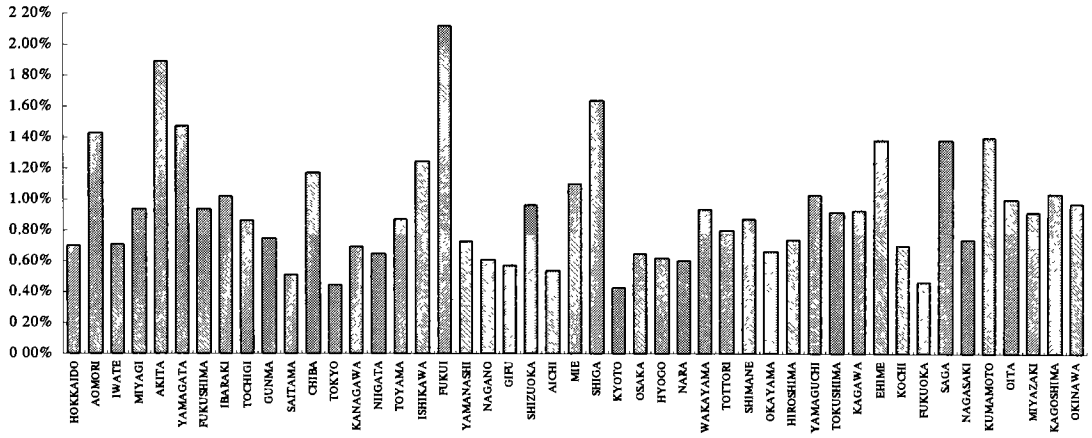
See Table 3-3-5.

Fig. 3-3-10 shows the percentages of ordinary expenditure for science and technology in the respective total amounts of government expenditure spent by respective prefectural governments (including ordinance-designated city governments). As in the ordinary expenditure for science and technology per head of population, Akita Prefecture (1.89%) and Fukui Prefecture (2.12%) showing high rates to their total amounts of government expenditure are outstanding, while Tokyo Metropolis highest in the amount of money shows a low percentage of 0.45% next to Kyoto Prefecture (0.43%). The average percentage was 0.78%.

Fig. 3-3-10 Percentages of ordinary expenditure for science and technology in the respective total amounts of government expenditure spent by respective prefectural governments (including ordinance-designated city governments) (FY 1992)

(1) In the order of prefectures

Ordinary expenditure/total government expenditure



(2) In the order of amounts of money

Ordinary expenditure/total government expenditure

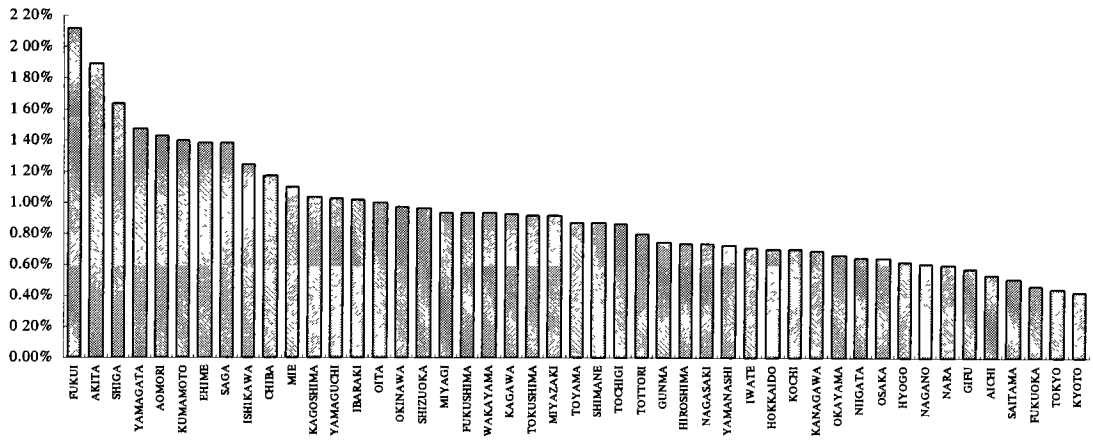
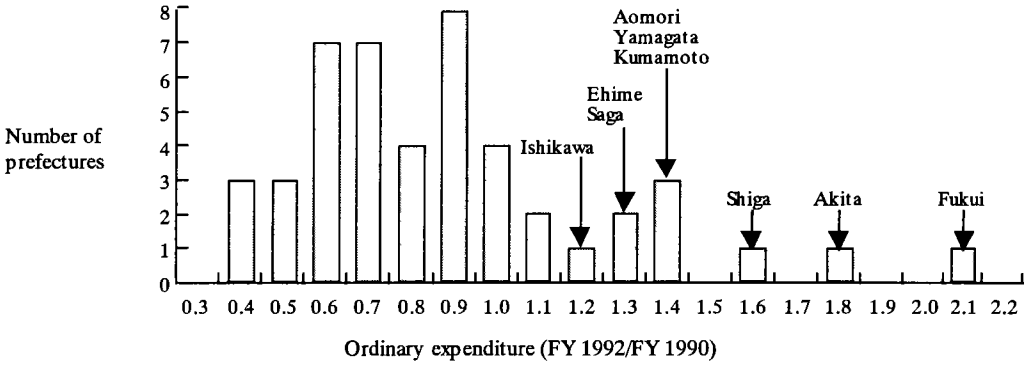


Fig. 3-3-11 is a histogram showing the percentages of ordinary expenditure for science and technology in the respective total amounts of government expenditure spent by respective prefectural governments (including ordinance-designated city governments) in 0.1% steps. The number of prefectures belonging to "0.9% to less than 1.0%" was 9, that belonging to "0.6% to less than 0.7%", 7, and that belonging to "0.7% to less than 0.8%", 6.

Fig. 3-3-11 Distribution of prefectures (including ordinance-designated cities) in the percentage of ordinary expenditure for science and technology in the total amount of government expenditure (FY 1992)



See Table 3-3- 5.

Table 3-3-5 Relation between the ordinary expenditure for science and technology and population, etc. of respective prefectures (including ordinance-designated cities)

Name of prefecture (including ordinance-designated city)	Ordinary expenditure (a) (in one million yen)	Population (FY 1992) *1		FY 1992 *2		Government expenditure/ head of population (c/b) (in 1,000 yen)
		(b) (in 1000 persons)	(a)/(b) (yen)	Government expenditure (c) (in 1,000 million yen)	(a/c)	
Hokkaido	24,047	5,659	4,249	3,452	0.70%	610
Aomori	10,250	1,472	6,963	717	1.43%	487
Iwate	5,231	1,414	3,700	741	0.71%	524
Miyagi	10,974	2,277	4,819	1,165	0.94%	512
Akita	12,479	1,219	10,237	661	1.89%	542
Yamagata	9,414	1,255	7,501	640	1.47%	510
Fukushima	8,263	2,115	3,907	879	0.94%	416
Ibaraki	9,659	2,895	3,337	946	1.02%	327
Tochigi	6,072	1,957	3,103	703	0.86%	359
Gunma	5,276	1,983	2,660	700	0.75%	353
Saitama	7,452	6,561	1,136	1,475	0.51%	225
Chiba	19,581	5,673	3,452	1,677	1.17%	296
Tokyo	31,179	11,874	2,626	6,952	0.45%	585
Kanagawa	25,036	8,104	3,089	3,603	0.69%	445
Niigata	7,663	2,475	3,096	1,178	0.65%	476
Toyama	4,914	1,120	4,388	566	0.87%	505
Ishikawa	6,804	1,169	5,820	545	1.25%	466
Fukui	9,896	824	12,010	467	2.12%	567
Yamanashi	3,383	862	3,925	461	0.73%	535
Nagano	5,921	2,165	2,735	970	0.61%	448
Gifu	4,161	2,080	2,001	724	0.57%	348
Shizuoka	11,042	3,701	2,984	1,147	0.96%	310
Aichi	15,757	6,766	2,329	2,931	0.54%	433
Mie	7,324	1,811	4,044	669	1.10%	369
Shiga	8,668	1,246	6,957	528	1.64%	424
Kyoto	6,243	2,606	2,396	1,453	0.43%	558
Osaka	26,294	8,735	3,010	4,034	0.65%	462
Hyogo	15,398	5,466	2,817	2,494	0.62%	456
Nara	2,997	1,401	2,139	503	0.60%	359
Wakayama	4,960	1,078	4,601	525	0.94%	487
Tottori	3,008	615	4,891	375	0.80%	610
Shimane	4,778	775	6,165	548	0.87%	707
Okayama	4,996	1,932	2,586	752	0.66%	389
Hiroshima	11,143	2,867	3,887	1,516	0.74%	529
Yamaguchi	6,985	1,565	4,463	681	1.03%	435
Tokushima	4,494	830	5,414	489	0.92%	589
Kagawa	4,272	1,024	4,172	458	0.93%	447
Ehime	8,110	1,511	5,368	586	1.38%	388
Kochi	3,908	817	4,784	555	0.70%	679
Fukuoka	10,999	4,852	2,267	2,398	0.46%	494
Saga	6,361	878	7,245	461	1.38%	525
Nagasaki	5,350	1,552	3,447	721	0.74%	464
Kumamoto	11,005	1,845	5,965	784	1.40%	425
Oita	6,053	1,233	4,909	607	1.00%	493
Miyazaki	5,118	1,167	4,386	554	0.92%	474
Kagoshima	8,884	1,787	4,972	858	1.04%	480
Okinawa	5,439	1,238	4,393	560	0.97%	452
Total	437,242	124,451	3,513	56,409	0.78%	453
Mean	9,303	2,648	3,513	1,200	0.78%	453

Sources: *1 Statistics Bureau, Management and Coordination Agency, Estimated Population as of October 1, 1992
*2 Ministry of Home Affairs, White Paper on Regional Finance (FY 1994 edition)

(3) Breakdown of ordinary expenditure for science and technology into respective service categories

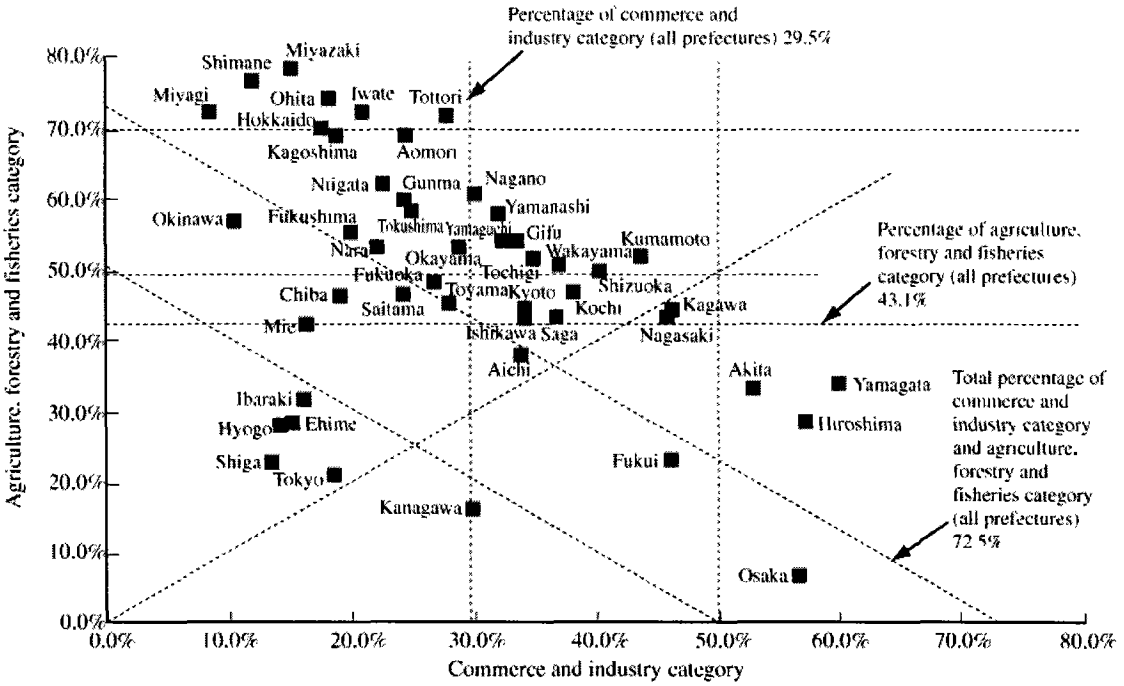
Fig. 3-3-12 shows the distribution of respective prefectures (including ordinance-designated cities) in the breakdown of ordinary expenditure for science and technology into respective service categories, with the percentage of the agriculture, forestry and fisheries category chosen as the ordinate and the percentage of the commerce and industry category chosen as the abscissa.

The percentage of the agriculture, forestry and fisheries category of all the prefectures was 43%. Among the respective prefectures, the number of prefectures of more than 50% in the percentage of agriculture, forestry and fisheries category was as large as 24, more than one half of all the prefectures. The number of prefectures of more than 70% was 7, including Hokkaido, Iwate, Miyagi, Tottori, Shimane, Oita and Miyazaki. On the other hand, the number of prefectures of more than 50% in the percentage of the commerce and industry category was 4, including Akita (53%), Yamagata (60%), Osaka (57%) and Hiroshima (57%). Furthermore, the number of prefectures in which the expenditure for the commerce and industry category was larger than that for the agriculture, forestry and fisheries category was 8, including Akita, Yamagata, Kanagawa, Fukui, Osaka, Hiroshima, Kagawa and Nagasaki. Especially Fukui Prefecture, Akita Prefecture and Yamagata Prefecture are also high in the percentage of the ordinary expenditure for science and technology in the government expenditure (Fig. 3-3-13), to show that these governments were making positive efforts for the activities in the commerce and industry category.

The total percentage of the agriculture, forestry and fisheries category and the commerce and industry category of all the prefectures was 72.5%, to show that science and technology policies were taken mainly for industries. Also in the respective prefectures, a majority of 34 prefectures showed percentages above 72.5%, to show that science and technology policies were taken mainly for industries. Furthermore, the number of prefectures of more than 90% was 10, including Aomori, Iwate, Yamagata, Nagano, Shizuoka, Tottori, Kagawa, Kumamoto, Oita and Miyazaki.

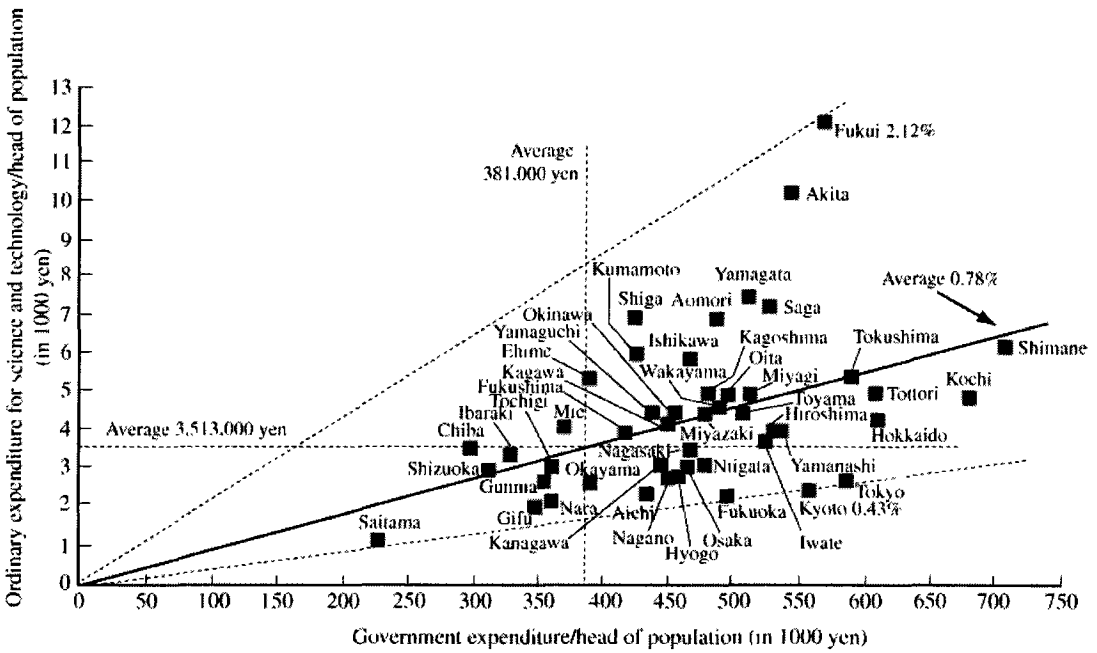
The number of prefectures of less than 50% in the total percentage of the agriculture, forestry and fisheries category and the commerce and industry category was 6, including Ibaraki, Tokyo, Kanagawa, Shiga, Hyogo and Ehime. However, Ibaraki Prefecture, Shiga Prefecture and Ehime Prefecture spent more than 40% in the education category owing to any special factor such as construction of a natural science museum, etc. In view of percentages of respective service categories, only a few prefectures took science and technology policies for the environment & civil engineering and health & sanitation category and the category of improvement of quality of life of citizens.

Fig. 3-3-12 Percentages of respective service categories in ordinary expenditure for science and technology spent by respective prefectural governments (including ordinance-designated city governments) (FY 1992)



See Table 3-3-6.

Fig. 3-3-13 Government expenditure and ordinary expenditure for science and technology spent by prefectural governments (including ordinance-designated city governments)



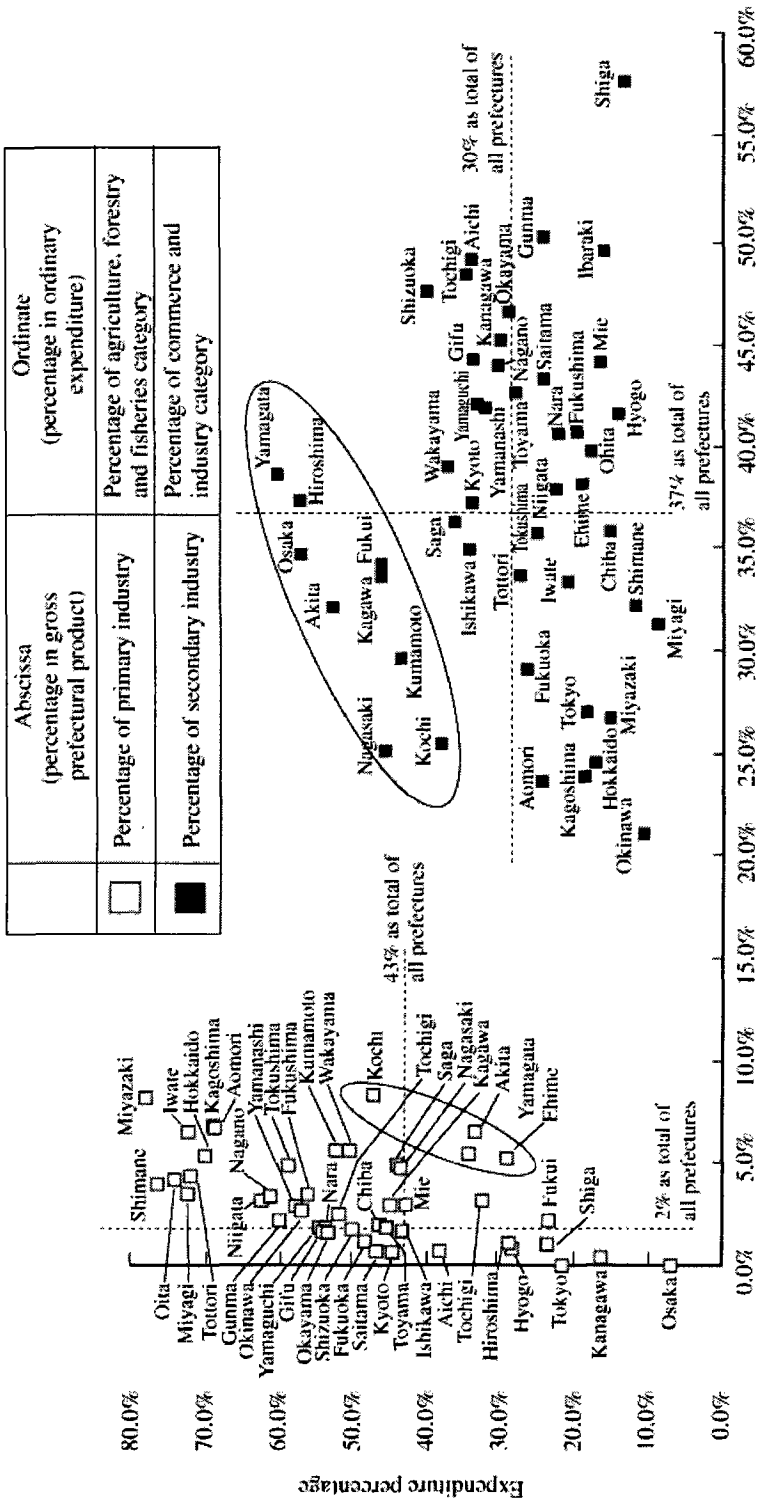
Note: Each percentage is the percentage of ordinary expenditure for science and technology in government expenditure.

See Table 3-3-5.

Fig. 3-3-14 is a diagram plotting the relation between the percentage of the commerce and industry category in the ordinary expenditure for science and technology and the percentage of the secondary industry in the gross prefectural product, and the relation between the percentage of the agriculture, forestry and fisheries category in the ordinary expenditure for science and technology and the percentage of the primary industry in the gross prefectural product, for respective prefectures (including ordinance-designated cities). From the diagram, it can be seen that in the respective prefectures, though the percentage of the primary industry (2% in the total of all the prefectures) was very lower than that of the secondary industry (37% in the total of all the prefectures), the percentage of the agriculture, forestry and fisheries category in the ordinary expenditure for science and technology was larger than that of the commerce and industry category (the percentage of the agriculture, forestry and fisheries category was 43% as the total of all the prefectures, while that of the commerce and industry category was 30%).

In the relation of the percentage of the secondary industry in the gross prefectural product and the percentage of the commerce and industry category in the ordinary expenditure for science and technology, 9 prefectures of Akita, Yamagata, Fukui, Osaka, Hiroshima, Kagawa, Kochi, Nagasaki and Kumamoto spent more ordinary expenditure for the commerce and industry category of science and technology than the other prefectures, and in the relation between the percentage of the primary industry in the gross prefectural product and the percentage of the agriculture, forestry and fisheries category in the ordinary expenditure for science and technology, Akita Prefecture, Yamagata Prefecture, Kochi Prefecture and Ehime Prefecture were smaller in the expenditure spent for the agriculture, forestry and fisheries category of science and technology. From these results, it can be seen that especially Akita Prefecture and Yamagata Prefecture were not only high in the percentage of expenditure for science and technology in government expenditure, but also kept the ordinary expenditure for the agriculture, forestry and fisheries categories of science and technology lower than the other prefectures in view of industrial structure, to make positive efforts for commerce and industry activities.

Fig. 3-3-14 Industrial structures and percentages of respective service categories in the ordinary expenditure for science and technology, of respective prefectures (including ordinance-designated cities) (FY 1992)



See Table 3-3-8.

Table 3-3-6 Percentages of respective service categories in ordinary expenditure for science and technology, of respective prefectures (including ordinance-designated cities) (FY 1992)

Name of prefecture	Commerce and industry	Agriculture, forestry and fisheries	Environment & civil engineering and health & sanitation	Citizens and life	Education	Planning and general affairs	Total	(Reference) Total of commerce and industry category and agriculture, forestry and fisheries category
Hokkaido	17.7%	70.0%	10.6%	0.0%	0.0%	1.8%	100.0%	87.7%
Aomori	24.5%	68.9%	6.6%	0.0%	0.0%	0.0%	100.0%	93.4%
Iwate	21.0%	72.3%	6.5%	0.0%	0.0%	0.2%	100.0%	93.3%
Miyagi	8.7%	72.2%	14.9%	0.0%	4.0%	0.1%	100.0%	81.0%
Akita	53.0%	33.2%	13.9%	0.0%	0.0%	0.0%	100.0%	86.1%
Yamagata	60.1%	34.1%	5.3%	0.0%	0.4%	0.1%	100.0%	94.2%
Fukushima	19.9%	56.0%	8.0%	0.0%	16.1%	0.0%	100.0%	75.9%
Ibaraki	16.0%	32.1%	8.8%	0.0%	43.0%	0.0%	100.0%	48.2%
Tochigi	34.8%	51.9%	6.4%	0.0%	6.9%	0.0%	100.0%	86.7%
Gunma	24.4%	59.8%	8.1%	0.0%	7.8%	0.0%	100.0%	84.1%
Saitama	24.4%	47.0%	27.2%	0.6%	0.7%	0.1%	100.0%	71.4%
Chiba	19.1%	46.3%	10.3%	0.0%	18.8%	5.4%	100.0%	65.5%
Tokyo	18.5%	21.3%	53.8%	3.0%	3.4%	0.0%	100.0%	39.9%
Kanagawa	29.9%	16.4%	18.9%	0.1%	25.8%	9.0%	100.0%	46.3%
Niigata	22.6%	62.4%	9.3%	0.0%	5.8%	0.0%	100.0%	85.0%
Toyama	28.1%	45.5%	26.3%	0.0%	0.0%	0.1%	100.0%	73.6%
Ishikawa	34.3%	43.5%	22.2%	0.0%	0.0%	0.0%	100.0%	77.8%
Fukui	46.3%	23.5%	12.3%	0.0%	17.3%	0.5%	100.0%	69.8%
Yamanashi	32.1%	57.6%	9.0%	0.0%	0.2%	1.1%	100.0%	89.7%
Nagano	30.3%	61.0%	8.3%	0.4%	0.0%	0.0%	100.0%	91.3%
Gifu	33.6%	54.2%	12.2%	0.0%	0.0%	0.0%	100.0%	87.8%
Shizuoka	40.3%	50.1%	9.6%	0.0%	0.0%	0.0%	100.0%	90.4%
Aichi	33.9%	38.2%	27.9%	0.0%	0.0%	0.0%	100.0%	72.1%
Mie	16.4%	42.7%	8.6%	0.0%	0.7%	31.6%	100.0%	59.0%
Shiga	13.5%	23.4%	18.3%	0.0%	44.8%	0.0%	100.0%	36.8%
Kyoto	34.3%	44.7%	16.7%	0.0%	4.3%	0.0%	100.0%	79.0%
Osaka	56.8%	6.7%	35.6%	0.0%	0.9%	0.0%	100.0%	63.5%
Hyogo	14.3%	28.5%	13.4%	0.0%	23.1%	20.7%	100.0%	42.8%
Nara	22.1%	53.5%	22.8%	0.0%	0.0%	1.7%	100.0%	75.6%
Wakayama	37.2%	50.8%	10.4%	0.0%	1.6%	0.0%	100.0%	88.0%
Tottori	27.8%	71.8%	0.0%	0.0%	0.3%	0.0%	100.0%	99.7%
Shimane	12.0%	76.4%	11.6%	0.0%	0.0%	0.0%	100.0%	88.4%
Okayama	29.0%	53.4%	17.3%	0.0%	0.2%	0.0%	100.0%	82.4%
Hiroshima	57.2%	28.8%	13.5%	0.0%	0.4%	0.2%	100.0%	85.9%
Yamaguchi	32.9%	54.5%	11.3%	0.0%	1.3%	0.0%	100.0%	87.4%
Tokushima	25.1%	58.7%	12.2%	0.0%	4.0%	0.0%	100.0%	83.8%
Kagawa	46.3%	44.8%	8.8%	0.0%	0.0%	0.0%	100.0%	91.1%
Ehime	15.3%	28.7%	11.8%	0.0%	44.2%	0.0%	100.0%	44.0%
Kochi	38.3%	47.2%	14.5%	0.0%	0.0%	0.0%	100.0%	85.5%
Fukuoka	26.7%	48.4%	13.1%	0.0%	8.3%	3.4%	100.0%	75.2%
Saga	36.8%	43.8%	8.7%	1.0%	9.3%	0.5%	100.0%	80.6%
Nagasaki	45.8%	43.5%	10.5%	0.0%	0.1%	0.0%	100.0%	89.3%
Kumamoto	43.8%	52.3%	3.9%	0.0%	0.0%	0.0%	100.0%	96.1%
Oita	18.1%	74.3%	7.6%	0.0%	0.0%	0.0%	100.0%	92.4%
Miyazaki	15.3%	78.0%	5.7%	0.0%	1.1%	0.0%	100.0%	93.2%
Kagoshima	18.7%	69.0%	9.9%	0.0%	1.5%	0.9%	100.0%	87.7%
Okinawa	10.6%	57.0%	25.2%	0.0%	7.2%	0.0%	100.0%	67.6%
Total	29.5%	43.1%	17.1%	0.2%	7.8%	2.3%	100.0%	72.5%

See Table 3-3-7.

Table 3-3-7 Breakdown of ordinary expenditure for science and technology into respective service categories, of respective prefectures and ordinance-designated cities (FY 1992)

(In 1000 yen)

Name of prefecture	Commerce and industry	Agriculture, forestry and fisheries	Environment & civil engineering and health & sanitation	Citizens and life	Education	Planning and general affairs	Total
Hokkaido	4,172,190	16,832,623	2,541,370	0	1,000	427,250	23,974,433
Aomori	2,509,011	7,059,856	676,274	0	0	5,000	10,250,141
Iwate	1,097,906	3,782,462	338,867	0	0	12,030	5,231,265
Miyagi	920,404	7,924,032	995,449	0	6,683	0	9,846,568
Akita	6,608,643	4,136,968	1,732,906	0	636	0	12,479,153
Yamagata	5,653,384	3,214,415	500,510	0	40,306	5,730	9,414,345
Fukushima	1,644,298	4,627,298	659,575	0	1,331,496	0	8,262,667
Ibaraki	1,548,321	3,102,668	850,959	0	4,157,301	0	9,659,249
Tochigi	2,115,902	3,148,880	385,604	0	421,604	0	6,071,990
Gunma	1,285,347	3,153,481	427,996	0	408,941	0	5,275,765
Saitama	1,817,218	3,500,526	2,027,260	45,401	51,369	10,195	7,451,969
Chiba	3,746,600	9,070,388	2,018,399	0	3,687,459	1,057,500	19,580,346
Tokyo	5,773,952	6,652,672	16,761,339	920,932	1,070,378	0	31,179,273
Kanagawa	7,149,301	3,995,092	3,273,039	14,307	5,759,856	2,253,608	22,445,203
Niigata	1,728,603	4,781,308	709,995	0	442,801	0	7,662,707
Toyama	1,379,796	2,237,627	1,292,714	0	0	4,305	4,914,442
Ishikawa	2,333,494	2,957,429	1,512,727	0	0	0	6,803,650
Fukui	4,583,571	2,326,014	1,217,202	0	1,715,000	54,409	9,896,196
Yamanashi	1,087,690	1,947,661	303,647	0	5,584	38,617	3,383,199
Nagano	1,791,488	3,612,047	491,327	25,676	0	0	5,920,538
Gifu	1,396,543	2,254,898	509,666	0	0	0	4,161,107
Shizuoka	4,451,260	5,533,214	1,054,735	0	0	3,089	11,042,298
Aichi	3,527,452	6,012,956	4,395,913	0	0	0	13,936,321
Mie	1,199,292	3,124,503	632,658	0	51,971	2,315,830	7,324,254
Shiga	1,166,824	2,026,306	1,587,711	0	3,887,332	0	8,668,173
Kyoto	1,473,130	2,793,101	510,928	0	230	0	4,777,389
Osaka	13,286,775	1,758,497	6,721,632	0	43,582	3,000	21,813,486
Hyogo	2,159,237	4,394,815	1,280,162	0	3,055,523	3,193,813	14,083,550
Nara	661,518	1,603,028	682,496	0	0	50,000	2,997,042
Wakayama	1,846,158	2,519,477	515,482	0	78,074	573	4,959,764
Tottori	837,620	2,161,140	0	0	9,366	0	3,008,126
Shimane	571,805	3,650,088	556,055	0	0	0	4,777,948
Okayama	1,449,868	2,669,217	865,318	0	11,590	0	4,995,993
Hiroshima	5,238,786	3,204,646	821,948	0	4,241	20,352	9,289,973
Yamaguchi	2,297,963	3,803,916	792,612	0	90,725	0	6,985,216
Tokushima	1,128,004	2,637,472	546,475	0	181,788	0	4,493,739
Kagawa	1,977,881	1,915,350	377,789	0	1,338	0	4,272,358
Ehime	1,242,274	2,323,683	960,186	0	3,584,317	0	8,110,460
Kochi	1,496,194	1,845,766	566,283	0	0	0	3,908,243
Fukuoka	2,828,355	5,321,159	985,026	0	447,949	0	9,582,489
Saga	2,343,342	2,783,426	550,391	61,840	590,503	31,731	6,361,233
Nagasaki	2,449,397	2,328,749	563,795	0	7,800	0	5,349,741
Kumamoto	4,816,895	5,757,033	430,919	0	0	0	11,004,847
Oita	1,095,359	4,495,834	459,674	0	410	2,018	6,053,295
Miyazaki	782,072	3,990,389	291,872	0	53,804	0	5,118,137
Kagoshima	1,663,357	6,132,045	882,267	0	129,319	77,487	8,884,475
Okinawa	576,087	3,099,647	1,370,189	0	392,944	0	5,438,867
Total of all prefectures	122,910,567	188,203,802	67,629,341	1,068,156	31,723,220	9,566,537	421,101,623

Table 3-3-7 (continued)

(In 1000 yen)

Name of ordinance-designated city	Commerce and industry	Agriculture, forestry and fisheries	Environment & civil engineering and health & sanitation	Citizens of life	Education	Planning and general affairs	Total
Sapporo	72,331	0	0	0	0	0	72,331
Sendai	39,590	0	641,496	0	432,873	13,000	1,126,959
Chiba	0	0	0	0	658	0	658
Yokohama	315,900	115,077	545,384	0	689,581	0	1,665,942
Kawasaki	13,434	0	910,601	815	0	0	924,850
Nagoya	1,820,305	0	0	0	0	0	1,820,305
Kyoto	668,206	0	528,657	0	268,767	0	1,465,630
Osaka	1,658,687	0	2,636,066	0	185,670	0	4,480,423
Kobe	35,598	0	780,533	0	498,203	0	1,314,334
Hiroshima	1,132,443	0	679,327	0	41,291	0	1,853,061
Kitakyushu	88,583	0	459,820	0	467,923	372,171	1,388,497
Fukuoka	25,076	2,715	0	0	93	0	27,884
Total of all ordinance-designated cities	5,870,153	117,792	7,181,884	815	2,585,059	385,171	16,140,874
Total of all prefectures and ordinance-designated cities	128,780,720	188,321,594	74,811,225	1,068,971	34,308,279	9,951,708	437,242,497

Table 3-3-8 Industrial structures and percentages of respective service categories in ordinary expenditure for science and technology of respective prefectures (including ordinance-designated cities) (FY 1992)

	Percentages of respective service categories in ordinary expenditure				Percentage of respective industries in gross prefectural product **			
Name of prefecture	Commerce and industry	Agriculture, forestry and fisheries	Others *	Total	Primary	Secondary	Tertiary	Total
Hokkaido	17.7%	70.0%	12.3%	100.0%	5.5%	24.6%	72.6%	102.7%
Aomori	24.5%	68.9%	66.0%	100.0%	7.0%	23.6%	72.1%	102.7%
Iwate	21.0%	72.3%	67.0%	100.0%	6.7%	33.4%	62.7%	102.8%
Miyagi	8.7%	72.2%	19.0%	100.0%	3.7%	31.3%	68.9%	103.9%
Akita	53.0%	33.2%	13.9%	100.0%	6.7%	32.2%	64.0%	102.9%
Yamagata	60.1%	34.1%	58.0%	100.0%	5.5%	38.5%	59.8%	103.8%
Fukushima	19.9%	56.0%	24.1%	100.0%	3.6%	40.7%	58.9%	103.2%
Ibaraki	16.0%	32.1%	51.8%	100.0%	3.2%	49.5%	50.2%	102.9%
Tochigi	34.8%	51.9%	13.3%	100.0%	2.6%	48.2%	52.0%	102.8%
Gunma	24.4%	59.8%	15.9%	100.0%	2.3%	50.2%	52.4%	104.9%
Saitama	24.4%	47.0%	28.6%	100.0%	0.9%	43.2%	59.9%	104.0%
Chiba	19.1%	46.3%	34.5%	100.0%	2.1%	38.2%	63.9%	104.2%
Tokyo	18.5%	21.3%	60.1%	100.0%	0.1%	27.0%	83.2%	110.3%
Kanagawa	29.9%	16.4%	53.7%	100.0%	0.3%	45.1%	58.5%	103.9%
Niigata	22.6%	62.4%	15.0%	100.0%	3.2%	37.8%	62.4%	103.4%
Toyama	28.1%	45.5%	26.4%	100.0%	2.0%	42.6%	59.0%	103.6%
Ishikawa	34.3%	43.5%	22.2%	100.0%	1.8%	34.9%	67.4%	104.1%
Fukui	46.3%	23.5%	30.2%	100.0%	2.3%	34.2%	68.3%	104.8%
Yamanashi	32.1%	57.6%	10.3%	100.0%	3.0%	41.8%	58.6%	103.4%
Nagano	30.3%	61.0%	8.7%	100.0%	3.6%	43.8%	56.9%	104.3%
Gifu	33.6%	54.2%	12.2%	100.0%	1.8%	44.2%	57.5%	103.5%
Shizuoka	40.3%	50.1%	9.6%	100.0%	1.9%	47.5%	54.5%	103.9%
Aichi	33.9%	38.2%	27.9%	100.0%	0.9%	49.1%	53.5%	103.5%
Mie	16.4%	42.7%	41.0%	100.0%	3.0%	44.2%	55.4%	102.6%
Shiga	13.5%	23.4%	63.2%	100.0%	1.1%	57.7%	44.0%	102.8%
Kyoto	34.3%	44.7%	21.0%	100.0%	0.8%	37.0%	68.4%	106.2%
Osaka	56.8%	6.7%	36.5%	100.0%	0.1%	34.6%	71.5%	106.2%
Hyogo	14.3%	28.5%	57.2%	100.0%	1.0%	41.5%	61.6%	104.1%
Nara	22.1%	53.5%	24.4%	100.0%	2.0%	40.5%	61.4%	103.9%
Wakayama	37.2%	50.8%	12.0%	100.0%	5.7%	39.0%	59.5%	104.2%
Tottori	27.8%	71.8%	0.3%	100.0%	4.5%	33.6%	65.1%	103.2%
Shimane	12.0%	76.4%	11.6%	100.0%	4.1%	32.1%	67.0%	103.2%
Okayama	29.0%	53.4%	17.6%	100.0%	1.8%	46.4%	54.9%	103.1%
Hiroshima	57.2%	28.8%	14.1%	100.0%	1.2%	37.2%	65.4%	103.8%
Yamaguchi	32.9%	54.5%	12.6%	100.0%	2.0%	41.9%	58.8%	102.7%
Tokushima	25.1%	58.7%	16.2%	100.0%	5.1%	35.7%	63.3%	104.1%
Kagawa	46.3%	44.8%	8.9%	100.0%	3.0%	33.6%	69.1%	105.7%
Ehime	15.3%	28.7%	56.0%	100.0%	5.3%	35.8%	63.1%	104.2%
Kochi	38.3%	47.2%	14.5%	100.0%	8.3%	25.5%	71.1%	104.9%
Fukuoka	26.7%	48.4%	24.8%	100.0%	1.3%	29.1%	73.6%	104.0%
Saga	36.8%	43.8%	19.4%	100.0%	5.1%	36.3%	63.1%	104.5%
Nagasaki	45.8%	43.5%	10.7%	100.0%	5.0%	25.1%	73.4%	103.5%
Kumamoto	43.8%	52.3%	3.9%	100.0%	5.7%	29.6%	68.4%	103.7%
Oita	18.1%	74.3%	7.6%	100.0%	4.4%	39.7%	58.6%	102.7%
Miyazaki	15.3%	78.0%	6.8%	100.0%	8.4%	26.7%	67.7%	102.8%
Kagoshima	18.7%	69.0%	12.3%	100.0%	7.0%	24.0%	72.9%	103.9%
Okinawa	10.6%	57.0%	32.4%	100.0%	2.8%	21.0%	79.0%	102.8%
Total	295.0%	43.1%	27.5%	100.0%	1.9%	37.0%	66.2%	105.1%

* Others mean the total of environment & civil engineering and health & sanitation category, citizens and life category, education category and planning and general affairs category.

** Source: Prefectural Economic Accounting Annual Report (FY 1994 edition) (Economic Research Institute, Economic Planning Agency)

3-4 Expenditure for Regional Research Institutes (Kousetsushi: Prefectural/Municipal Industrial Research Institutes)

(1) Number of regional research institutes, etc.

Table 3-4-1 shows the numbers of institutions, amounts of expenditure and numbers of researchers of local public experiment and research institutions (hereinafter called "regional research institutes").

The number of regional research institutes of prefectural governments was 555, and that of 12 ordinance-designated city governments, 20, hence total, 575.

The expenditure for regional research institutes in FY 1992 of 47 prefectures was about 354,800 million yen, and that of 12 ordinance-designated cities, about 16,900 million yen, hence total, about 371,700 million yen. The total expenditure accounted for 61% of the total expenditure for science and technology (371,700 million yen) (Table 3-2-10). As for its breakdown, it is notable that the running expenditure amounted to about 328,300 million yen (88%), a majority, and that the restructuring expenditure amounted to more than 10% (14%).

The number of researchers of prefectures was 14,788, and that of the ordinance-designated cities, 604, hence total, 15,392. The number corresponds to 1.66 times the number of researchers (9,256) of 73 national natural science research institutions (excluding institutions affiliated to universities).

The number of researchers per institution was 27 (15,392/575 institutions), and the running expenditure per institution was 57 million yen (328,294 million yen/575 institutions). The number of researchers per one national natural science research institution was 127 (9,256/73 institutions), to show that the scale of researchers of regional research institutes was about one fifth of that of national research institutions.

Table 3-4-1 Numbers of institutions, numbers of researchers and amounts of expenditure of regional research institutes

Item	47 prefectures		12 ordinance-designated cities		Total	
	Number or amount	Percentage	Number or amount	Percentage	Number or amount	Percentage
Number of institutions	555	–	20	–	575	–
Expenditure for regional research institutes	354,803 million yen	100.0%	16,869 million yen	100.0%	354,803 million yen	100.0%
Running expenditure	317,818 million yen	89.6%	10,475 million yen	62.1%	328,293 million yen	88.3%
Restructuring expenditure	44,112 million yen	12.4%	6,390 million yen	37.9%	50,502 million yen	13.6%
Research function intensifying expenditure	28,121 million yen	7.9%	16 million yen	0.1%	28,137 million yen	7.6%
Number of researchers (a)	14,788 persons	–	604 persons	–	15,392 persons	–
Fixed number of national natural science experiment and research institutions (b) *2					9,256 persons	
(a)/(b)					1.66	

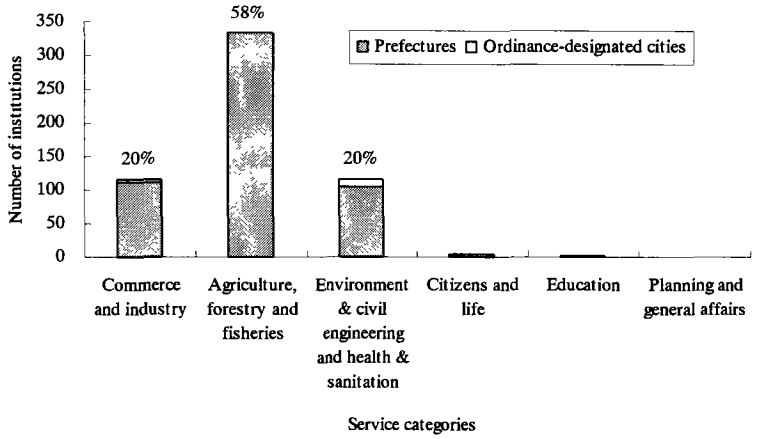
Notes: *1 Because of double counting, the expenditure for regional research institutes does not agree with the calculated total.

**2 Fixed number in budget at the end of FY 1992 (Source: Expenditure for science and technology of FY 1992 budget bill, Science and Technology Agency)

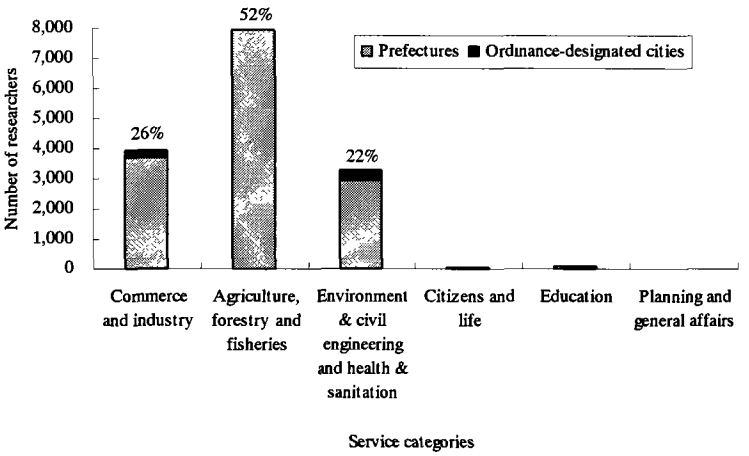
Fig. 3-4-1 shows the numbers of institutions, numbers of researchers and amounts of running expenditure, of regional research institutes by service category. The agriculture, forestry and fisheries category accounted for more than 50% in all of the number of institutions, number of researchers and running expenditure, being followed by the commerce and industry category and the environment & civil engineering and health & sanitation category in this order. Both the commerce and industry category and the environment & civil engineering and health & sanitation category were less than one half in all of the number of institutions, number of researchers and running expenditure, compared to the agriculture, forestry and fisheries category.

Fig. 3-4-1 Numbers of institutions, numbers of researchers and amounts of running expenditure, of regional research institutes by service category

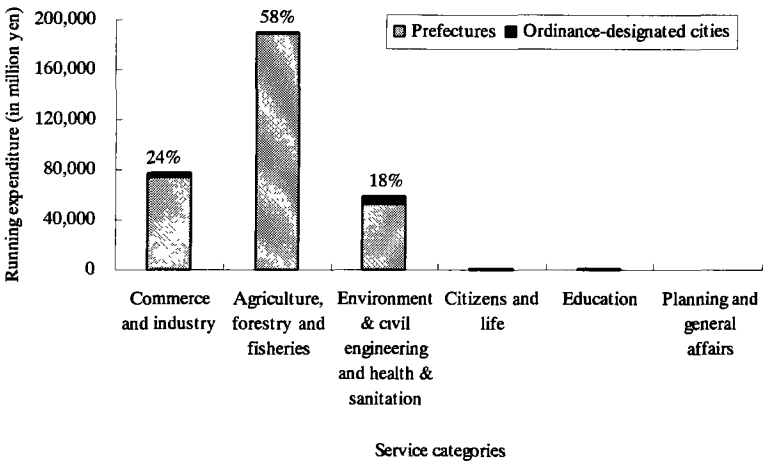
(1) Number of institutions (575)



(2) Number of researchers (15,392 persons)



(3) Running expenditure (328,293 million yen)

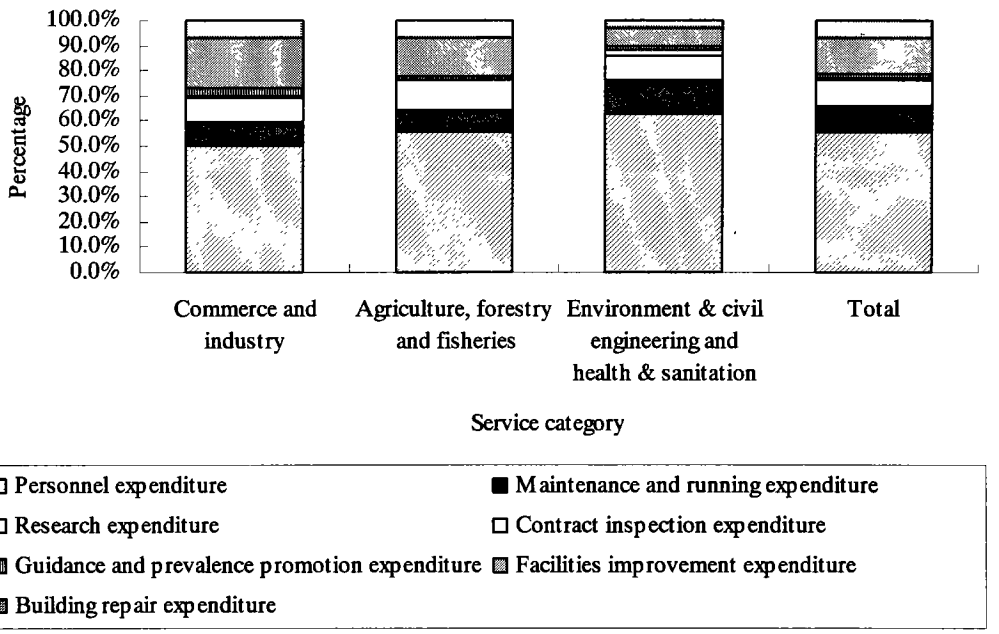


See Table 3-4-2.

As for the percentages of researchers to full-time personnel (total of researchers and other personnel than researchers), the commerce and industry category was 79% and the environment & civil engineering and health & sanitation category, 71%. On the contrary, the agriculture, forestry and fisheries category was as low as 54% (Table 3-4-2).

In the breakdown of the running expenditure, the personnel expenditure accounted for the largest 56%, and the research expenditure was 11%. In the breakdown of the running expenditure respectively in the commerce and industry category, the agriculture, forestry and fisheries category and the environment & civil engineering and health & sanitation category, the personnel expenditure in the environment & civil engineering and health & sanitation category accounted for the largest 62%, being followed by 56% in the agriculture, forestry and fisheries category and 50% in the commerce and industry category in this order. The percentages of research expenditure were 12% in the agricultural, forestry and fisheries category and 9% each in the environment & civil engineering and health & sanitation category and the commerce and industry category (Fig. 3-4-2).

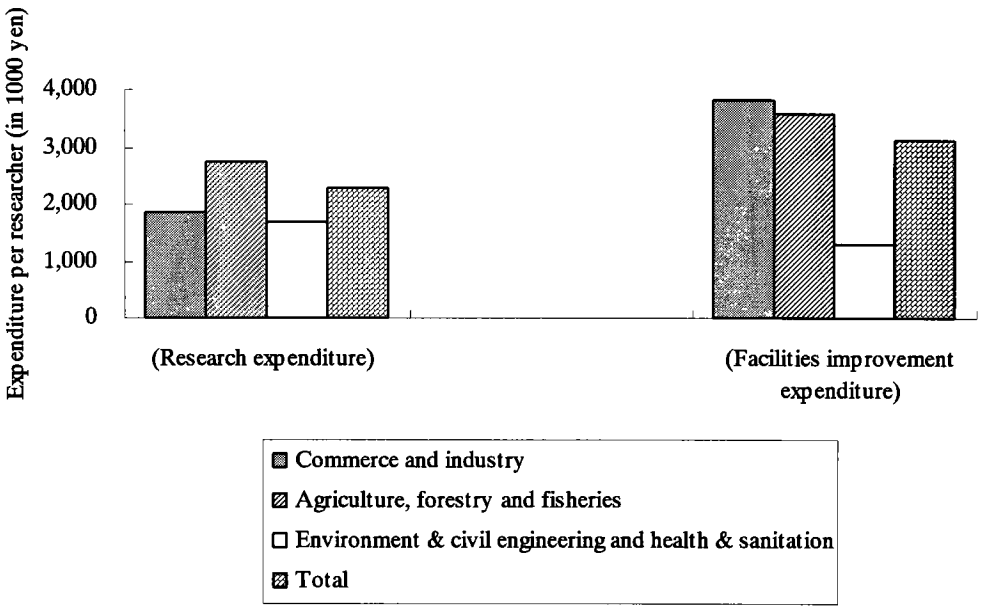
Fig. 3-4-2 Percentages of running expenditure of regional research institutes (including those of ordinance-designated cities) by service category (FY 1992)



See Table 3-4-2.

The research expenditure per researcher was 2,280,000 yen for all the service categories, 2,740,000 yen for the agriculture, forestry and fisheries category, 1,850,000 yen for the commerce and industry category, and 1,690,000 yen for the environment & civil engineering and health & sanitation category. The facilities improvement expenditure per researcher was 3,110,000 yen for all the service categories, 3,830,000 yen for the commerce and industry category, 3,560,000 yen for the agriculture, forestry and fisheries category and 1,300,000 yen for the environment & civil engineering and health & sanitation category (Fig. 3-4-3).

Fig. 3-4-3 Research expenditure and facilities improvement expenditure per researcher of regional research institutes (including those of ordinance-designated cities) (FY 1992)



See Table 3-4-2.

Table 3-4-2 Numbers of institutions, numbers of personnel and amounts of running expenditure of regional research institutes by service category

(1) Number of institutions

Service category	47 prefectures		12 ordinance-designated cities		Total	
	Number of institutions	Percentage	Number of institutions	Percentage	Number of institutions	Percentage
Commerce and industry	111	20.0%	6	30.0%	117	20.3%
Agriculture, forestry and fisheries	334	60.2%	1	5.0%	335	58.3%
Environment & civil engineering and health & sanitation	104	18.7%	13	65.0%	117	20.3%
Citizens and life	4	0.7%	0	0.0%	4	0.7%
Education	2	0.4%	0	0.0%	2	0.3%
Planning and general affairs	0	0.0%	0	0.0%	0	0.0%
Total	555	100.0%	20	100.0%	575	100.0%

(2) Number of personnel

Service category	47 prefectures				12 ordinance-designated cities				Total			
	Full-time personnel			Part-time personnel	Full-time personnel			Part-time personnel	Full-time personnel			Part-time personnel
	Researchers	Others than researchers	Total		Researchers	Others than researchers	Total		Researchers	Others than researchers	Total	
Commerce and industry	3,694	938	4,632	179	253	107	360	1	3,947	1,045	4,992	180
Agriculture, forestry and fisheries	7,954	6,708	14,662	1,123	12	5	17	0	7,966	6,713	14,679	1,123
Environment & civil engineering and health & sanitation	2,964	972	3,936	279	339	355	694	6	3,303	1,327	4,630	285
Citizens and life	71	14	85	5	0	0	0	0	71	14	85	5
Education	105	41	146	1	0	0	0	0	105	41	146	1
Planning and general affairs	0	0	0	0	0	0	0	0	0	0	0	0
Total	14,788	8,673	23,461	1,587	604	467	1,071	7	15,392	9,140	24,532	1,594

Service category	47 prefectures				12 ordinance-designated cities				Total			
	Full-time personnel			Part-time personnel	Full-time personnel			Part-time personnel	Full-time personnel			Part-time personnel
	Researchers	Others than researchers	Total		Researchers	Others than researchers	Total		Researchers	Others than researchers	Total	
Commerce and industry	79.7%	20.3%	100.0%	3.9%	70.3%	29.7%	100.0%	0.3%	79.1%	20.9%	100.0%	3.6%
Agriculture, forestry and fisheries	54.2%	45.8%	100.0%	7.7%	70.6%	29.4%	100.0%	0.0%	54.3%	45.7%	100.0%	7.7%
Environment & civil engineering and health & sanitation	75.3%	24.7%	100.0%	7.1%	48.8%	51.2%	100.0%	0.9%	71.3%	28.7%	100.0%	6.2%
Citizens and life	83.5%	16.5%	100.0%	5.9%	0.0%	0.0%	0.0%	0.0%	83.5%	16.5%	100.0%	5.9%
Education	71.9%	28.1%	100.0%	0.7%	0.0%	0.0%	0.0%	0.0%	71.9%	28.1%	100.0%	0.7%
Planning and general affairs	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	63.0%	37.0%	100.0%	6.8%	56.4%	43.6%	100.0%	0.7%	62.7%	37.3%	100.0%	6.5%

(3) Running expenditure

(In one million yen)

Service category	47 prefectures		12 ordinance-designated cities		Total	
	Running expenditure	Percentage	Running expenditure	Percentage	Running expenditure	Percentage
Commerce and industry	73,135	23.0%	4,188	40.0%	77,324	23.6%
Agriculture, forestry and fisheries	189,289	59.6%	115	1.1%	189,404	57.7%
Environment & civil engineering and health & sanitation	52,786	16.6%	6,172	58.9%	58,958	18.0%
Citizens and life	1,014	0.3%	0	0.0%	1,014	0.3%
Education	1,393	0.4%	0	0.0%	1,393	0.4%
Planning and general affairs	200	0.1%	0	0.0%	200	0.1%
Total	317,818	100.0%	10,475	100.0%	328,293	100.0%

(4) Breakdown of running expenditure

(In one million yen)

Service category	Personnel expenditure	Maintenance and running expenditure	Research expenditure	Contract inspection expenditure	Guidance and prevalence promotion expenditure	Facilities improvement expenditure	Building repair expenditure	Total
Commerce and industry	38,706	7,403	7,281	815	2,165	15,133	5,817	77,324
Agriculture, forestry and fisheries	105,181	17,002	21,809	686	2,014	28,376	14,337	189,404
Environment & civil engineering and health & sanitation	36,565	7,931	5,584	1,509	813	4,282	1,930	58,958
Citizens and life	691	91	203	9	9	11	0	1,014
Education	1,037	154	72	0	68	63	0	1,393
Planning and general affairs	0	0	199	0	1	0	0	200
Total	182,180	32,581	35,149	3,019	5,070	47,865	22,084	328,293

Note: Since some answers did not state the breakdown, each horizontal total does not agree with the calculated total.

Service category	Personnel expenditure	Maintenance and running expenditure	Research expenditure	Contract inspection expenditure	Guidance and prevalence promotion expenditure	Facilities improvement expenditure	Building repair expenditure	Total
Commerce and industry	50.1%	9.6%	9.4%	1.1%	2.8%	19.6%	7.5%	100.0%
Agriculture, forestry and fisheries	55.5%	9.0%	11.5%	0.4%	1.1%	15.0%	7.6%	100.0%
Environment & civil engineering and health & sanitation	62.4%	13.5%	9.5%	2.6%	1.4%	7.3%	3.3%	100.0%
Citizens and life	68.1%	9.0%	20.0%	0.9%	0.9%	1.1%	0.0%	100.0%
Education	74.4%	11.0%	5.2%	0.0%	4.8%	4.5%	0.0%	100.0%
Planning and general affairs	0.0%	0.0%	99.4%	0.0%	0.6%	0.0%	0.0%	100.0%
Total	55.6%	9.9%	10.7%	0.9%	1.5%	14.6%	6.7%	100.0%

(5) Running expenditure per researcher

(In one million yen)

Service category	Personnel expenditure	Maintenance and running expenditure	Research expenditure	Contract inspection expenditure	Guidance and prevalence promotion expenditure	Facilities improvement expenditure	Building repair expenditure	Total
Commerce and industry	9,806	1,876	1,845	206	549	3,834	1,474	19,591
Agriculture, forestry and fisheries	13,204	2,134	2,738	86	253	3,562	1,800	23,777
Environment & civil engineering and health & sanitation	11,070	2,401	1,691	457	246	1,296	584	17,850
Citizens and life	9,726	1,284	2,863	124	131	159	0	14,287
Education	9,873	1,466	685	0	643	596	0	13,263
Planning and general affairs								
Total	11,836	2,117	2,284	196	329	3,110	1,435	21,329

Compared with the previous survey on the comparable 45 prefectures, the number of institutions changed from 517 to 530, and the expenditure growth rate was 12% (Table 3-4-3). The institutions established during the period from the previous survey to the present survey include Foods Processing Research Center and Manufacturing Industry Technology Center (managed by Technopolis Foundation) of Hokkaido, Metals and Mining Training and Technology Center (managed by Akita Prefectural Resource and Technology Development Organization) and Advanced Technology Research Institute of Akita Prefecture, and High Technology Plaza of Fukushima Prefecture, respectively in the commerce and industry category, and Biology Engineering Research Institute of Ibaraki Prefecture, Shimane Taste Development and Guidance Center of Shimane Prefecture and Ocean Deep Water Research Institute of Kochi Prefecture, respectively in the agriculture, forestry and fisheries category, and so on.

Table 3-4-3 Comparison in the numbers of regional research institutes and amounts of running expenditure spent for them by competent administrative division, of 45 prefectures between FY 1990 and FY 1992 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)

Administrative division	FY 1990				FY 1992				FY 1992/FY 1990	
	Number of institutions	Percentage	Running expenditure (in one million yen)	Percentage	Number of institutions	Percentage	Running expenditure (in one million yen)	Percentage	Number of institutions	Running expenditure
Commerce and industry	101	19.5%	64,431	24.6%	103	19.4%	66,328	22.7%	102.0%	102.9%
Agriculture, forestry and fisheries	322	62.3%	157,012	60.0%	326	61.5%	180,316	61.7%	101.2%	114.8%
Environment and civil engineering	40	7.7%	17,291	6.6%	39	7.4%	16,039	5.5%	97.5%	92.8%
Health and sanitation	48	9.3%	21,263	8.1%	52	9.8%	25,493	8.7%	108.3%	119.9%
Citizens and life	3	0.6%	1,143	4.0%	7	1.3%	2,062	0.7%	233.3%	180.4%
Education	0	0.0%	0	0.0%	1	0.2%	578	0.2%	-	-
Planning and general affairs	3	0.6%	602	0.2%	2	0.4%	1,318	0.5%	66.7%	218.9%
Total of all the prefectures	517	100.0%	261,741	100.0%	530	100.0%	292,132	100.0%	102.5%	111.6%
Per institution			506.3				551.2			

(2) Regional comparison of local public experiment and research institutions

Fig. 3-4-4 shows the numbers of institutions, numbers of researchers and amounts of running expenditure of regional research institutes of respective prefectures (including ordinance-designated cities).

The number of institutions per prefecture was 12, and Chiba Prefecture and Kanagawa Prefecture had the largest 22 institutions respectively.

The number of researchers per prefecture was 327. Five prefectures of Hokkaido (954 persons),

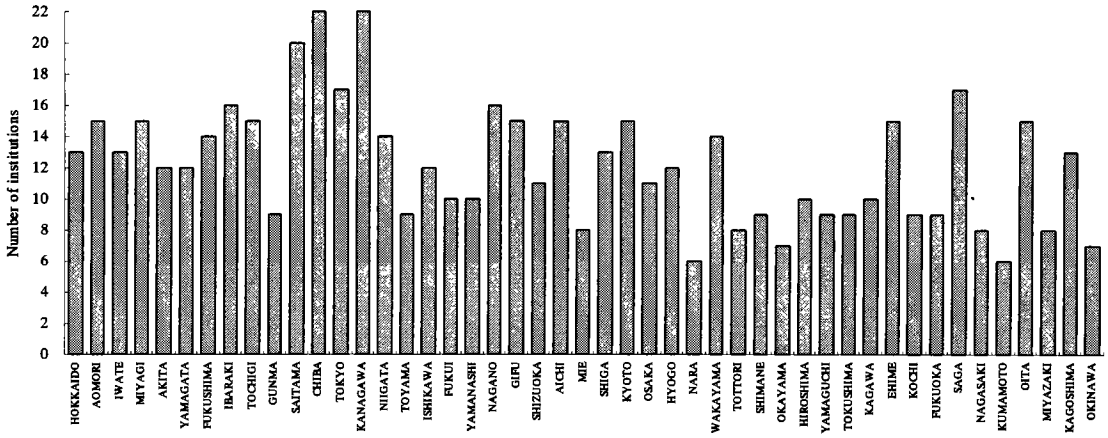
Tokyo (939 persons), Aichi (747 persons), Osaka (630 persons) and Kanagawa (624 persons) had more than 600 researchers respectively, being far larger than the other prefectures.

The running expenditure per prefecture was about 7,000 million yen. The trend in running expenditure is similar to that of researchers, but the large amounts of about 21,700 million yen spent by Hokkaido Government and Tokyo Metropolitan Government are outstanding.

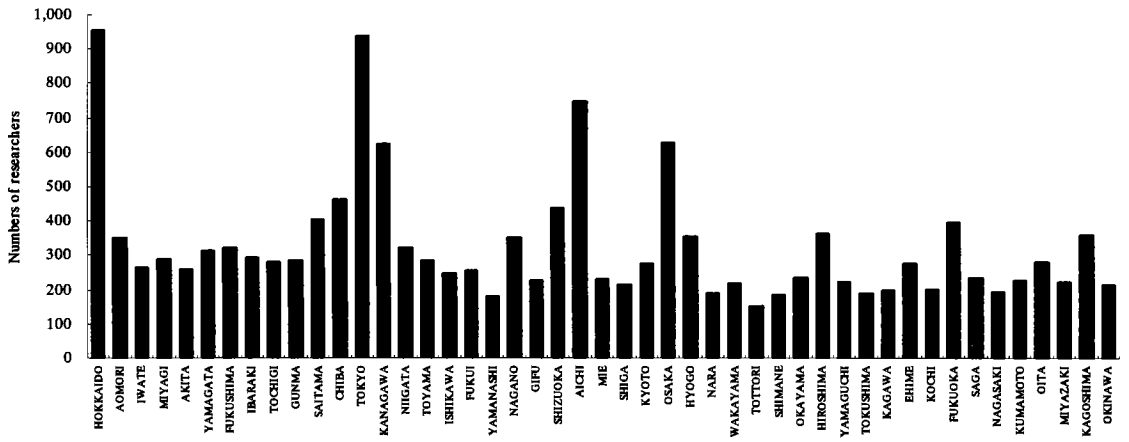
Fig. 3-4-4 Numbers of institutions, numbers of researchers and amounts of running expenditure of regional research institutes of respective prefectures (including ordinance-designated cities)

(1) In the order of regions

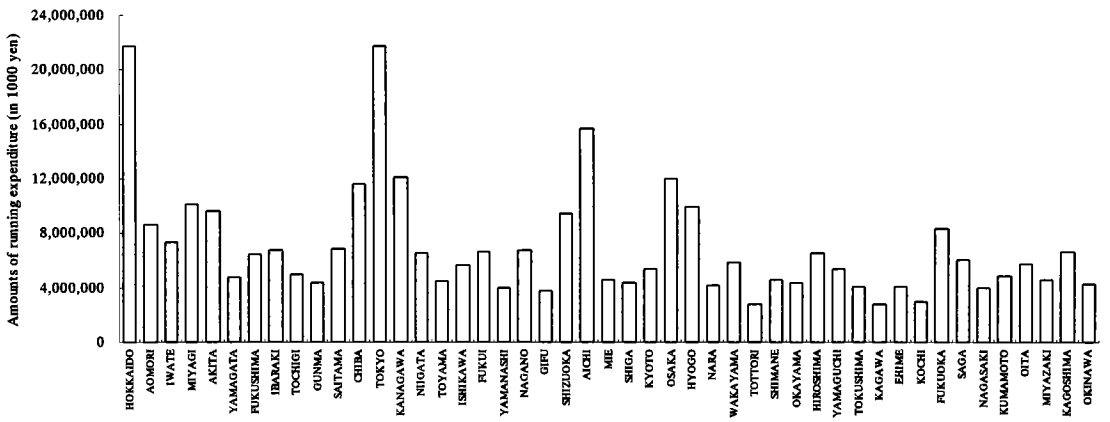
(a) Numbers of institutions



(b) Numbers of researchers

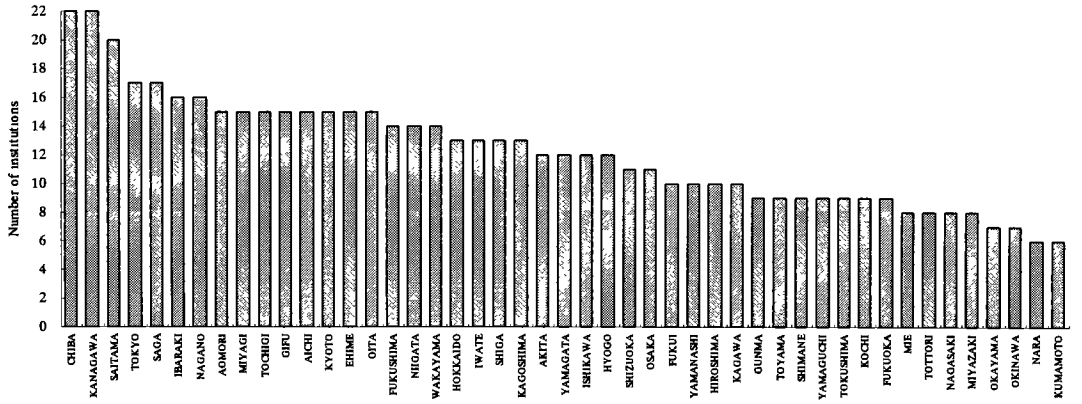


(c) Amounts of running expenditure

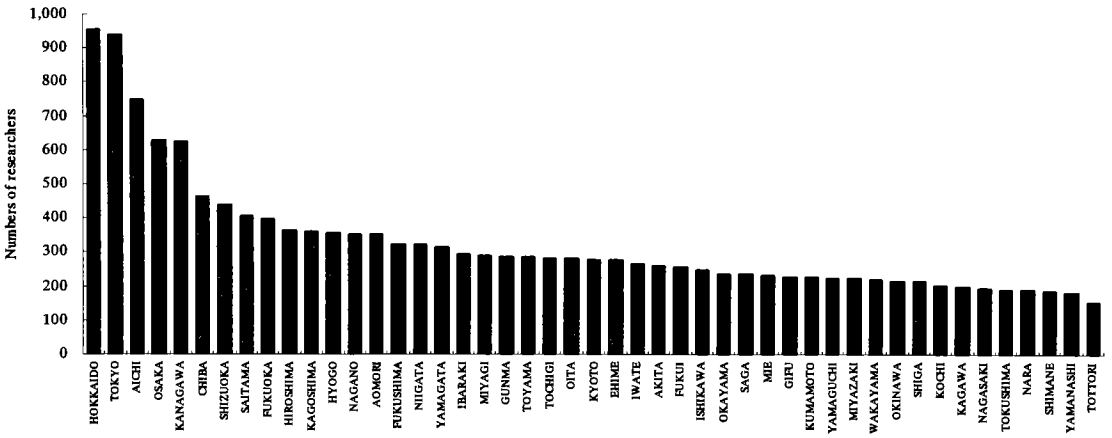


(2) In the order of scales

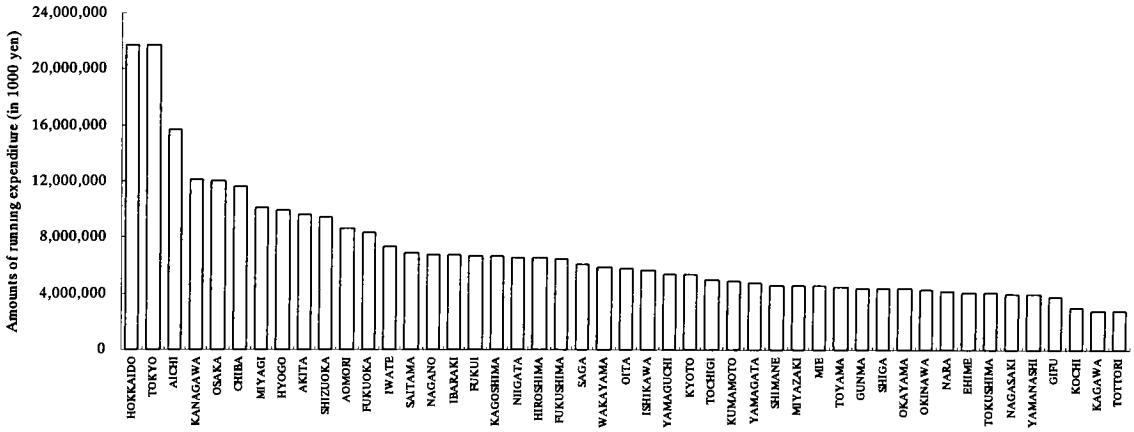
(a) Numbers of institutions



(b) Numbers of researchers)



(c) Amounts of running expenditure



See Table 3-4-4.

Table 3-4-4 Data of regional research institutes of respective prefectures and respective ordinance-designated cities by service category

(1) Numbers of institutions

	Commerce and industry	Agriculture, forestry and fisheries	Environment & civil engineering and health & sanitation	Citizens and life	Education	Planning and general affairs	Total
Hokkaido	4	5	4				13
Aomori	3	11	1				15
Iwate	2	9	2				13
Miyagi	1	11	2				14
Akita	4	6	2				12
Yamagata	1	9	2				12
Fukushima	1	10	3				14
Ibaraki	1	12	3				16
Tochigi	6	7	2				15
Gunma	2	6	1				9
Saitama	5	10	4	1			20
Chiba	2	15	5				22
Tokyo	6	4	4	2	1		17
Kanagawa	4	7	4				15
Niigata	2	11	1				14
Toyama	1	5	3				9
Ishikawa	2	8	2				12
Fukui	1	6	3				10
Yamanashi	2	7	1				10
Nagano	4	11	1				16
Gifu	4	9	2				15
Shizuoka	1	9	1				11
Aichi	6	3	5				14
Mie	3	3	2				8
Shiga	4	6	3				13
Kyoto	2	8	1				11
Osaka	1	3	4				8
Hyogo	1	6	4				11
Nara	1	3	2				6
Wakayama	2	10	2				14
Tottori	2	6	0				8
Shimane	1	6	2				9
Okayama	1	5	1				7
Hiroshima	3	4	1				8
Yamaguchi	1	7	1				9
Tokushima	1	7	1				9
Kagawa	3	4	3				10
Ehime	4	8	3				15
Kochi	2	5	2				9
Fukuoka	1	6	1				8
Saga	2	9	4	1	1		17
Nagasaki	2	4	2				8
Kumamoto	1	4	1				6
Oita	3	11	1				15
Miyazaki	2	5	1				8
Kagoshima	2	8	3				13
Okinawa	1	5	1				7
Total of prefectures	111	334	104	4	2	0	555
Sapporo			0				0
Sendai			1				1
Chiba			0				0
Yokohama	1	1	3				5
Kawasaki			2				2
Nagoya	1		0				1
Kyoto	2		2				4
Osaka	1		2				3
Kobe			1				1
Hiroshima	1		1				2
Kitakyushu			1				1
Fukuoka			0				0
Total of ordinance-designated cities	6	1	13	0	0	0	20
Total	117	335	117	4	2	0	575

(2) Numbers of researchers

	Commerce and industry	Agriculture, forestry and fisheries	Environment & civil engineering and health & sanitation	Citizens and life	Education	Planning and general affairs	Total
Hokkaido	155	650	149			0	954
Aomori	59	246	45				350
Iwate	45	192	28				265
Miyagi	33	192	66				291
Akita	64	158	38				260
Yamagata	90	181	42				313
Fukushima	75	214	35				324
Ibaraki	63	187	44				294
Tochigi	91	162	30				283
Gunma	60	188	38				286
Saitama	112	185	106	2			405
Chiba	61	309	94				464
Tokyo	317	135	345	69	73		939
Kanagawa	172	146	148				466
Niigata	91	177	55				323
Toyama	62	151	73				286
Ishikawa	77	109	60				246
Fukui	76	128	52				256
Yamanashi	65	93	24				182
Nagano	94	215	43				352
Gifu	76	116	37				229
Shizuoka	136	239	65				440
Aichi	186	237	231				654
Mie	70	115	46				231
Shiga	58	104	51				213
Kyoto	57	141	40				238
Osaka	184	73	208				465
Hyogo	100	152	64				316
Nara	31	103	55				189
Wakayama	58	122	38				218
Tottori	36	115	0				151
Shimane	33	127	25				185
Okayama	64	141	32				237
Hiroshima	113	134	44				291
Yamaguchi	41	138	46				225
Tokushima	43	118	31				192
Kagawa	44	115	41				200
Ehime	56	155	66				277
Kochi	43	126	32				201
Fukuoka	105	192	63				360
Saga	42	128	33	0	32		235
Nagasaki	39	125	32				196
Kumamoto	33	163	30				226
Oita	51	193	36				280
Miyazaki	48	151	25				224
Kagoshima	66	253	41				360
Okinawa	19	160	37				216
Total of prefectures	3,694	7,954	2,964	71	105	0	14,788
Sapporo			0				0
Sendai			0				0
Chiba							0
Yokohama	9	12	79				100
Kawasaki			58				58
Nagoya	93		0				93
Kyoto	32		8				40
Osaka	93		72				165
Kobe			41				41
Hiroshima	26		46				72
Kitakyushu			35				35
Fukuoka			0				0
Total of ordinance-designated cities	253	12	339	0	0	0	604
Total	3,947	7,966	3,303	71	105	0	15,392

(3) Amounts of running expenditure (in 1000 yen)

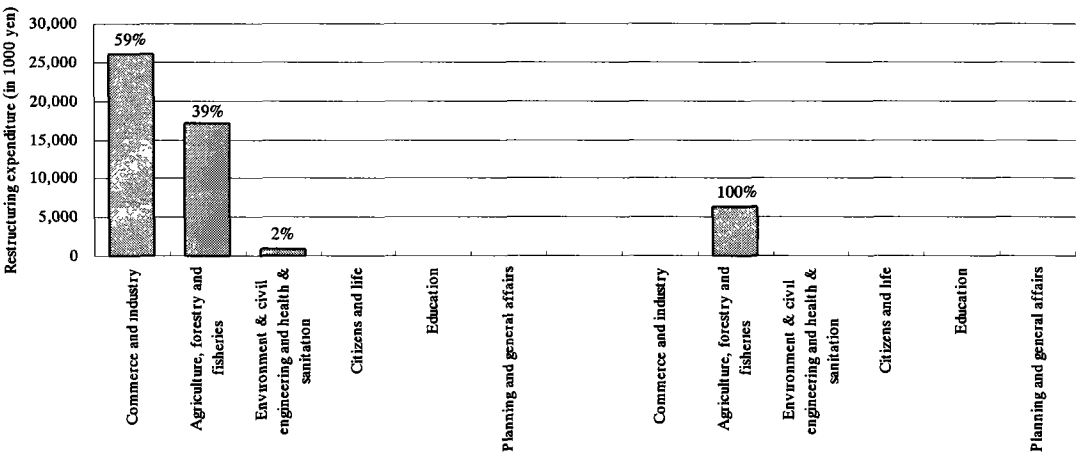
	Commerce and industry	Agriculture, forestry and fisheries	Environment & civil engineering and health & sanitation	Citizens and life	Education	Planning and general affairs	Total
Hokkaido	2,370,786	16,574,097	2,532,687			200,159	21,677,729
Aomori	951,997	7,026,649	662,018				8,640,664
Iwate	738,666	6,213,349	337,493				7,289,508
Miyagi	642,553	7,872,574	984,050				9,499,177
Akita	4,962,272	4,121,168	576,614				9,660,054
Yamagata	1,101,335	3,203,449	472,934				4,777,718
Fukushima	1,230,752	4,600,391	621,644				6,452,787
Ibaraki	803,857	5,099,840	843,286				6,746,983
Tochigi	1,462,366	3,148,880	385,604				4,996,850
Gunma	822,619	3,153,481	426,636				4,402,736
Saitama	1,616,550	3,371,096	1,780,569	31,621			6,799,836
Chiba	862,023	8,966,902	1,771,208				11,600,133
Tokyo	5,681,834	6,652,672	7,605,341	920,932	814,676		21,675,455
Kanagawa	3,605,901	3,884,474	3,086,640				10,577,015
Niigata	1,128,926	4,771,321	689,995				6,590,242
Toyama	986,605	2,204,137	1,253,122				4,443,864
Ishikawa	1,325,660	2,945,293	1,360,650				5,631,603
Fukui	3,167,163	2,316,162	1,195,881				6,679,206
Yamanashi	1,002,707	2,682,913	298,280				3,983,900
Nagano	2,853,252	3,448,841	489,827				6,791,920
Gifu	1,009,149	2,253,168	509,666				3,771,983
Shizuoka	2,878,087	5,542,967	1,004,072				9,425,126
Aichi	3,364,046	6,149,346	4,389,095				13,902,487
Mie	932,057	3,065,940	585,220				4,583,217
Shiga	1,067,416	2,026,306	1,295,840				4,389,562
Kyoto	1,179,722	2,768,448	505,366				4,453,536
Osaka	2,634,524	1,758,497	4,297,549				8,690,570
Hyogo	1,748,456	6,151,639	1,264,174				9,164,269
Nara	1,856,629	1,601,025	680,273				4,137,927
Wakayama	2,868,008	2,430,485	515,482				5,813,975
Tottori	617,344	2,156,492	0				2,773,836
Shimane	463,922	3,637,942	503,650				4,605,514
Okayama	906,134	2,608,261	863,487				4,377,882
Hiroshima	1,614,662	3,027,933	844,204				5,486,799
Yamaguchi	893,589	3,642,226	792,612				5,328,427
Tokushima	903,891	2,617,111	546,475				4,067,477
Kagawa	543,035	1,889,690	377,789				2,810,514
Ehime	1,012,816	2,176,148	910,480				4,099,444
Kochi	614,848	1,845,766	521,366				2,981,980
Fukuoka	1,931,579	5,002,303	985,026				7,918,908
Saga	2,057,699	2,782,709	542,865	61,840	577,963		6,023,076
Nagasaki	1,125,838	2,320,588	563,795				4,010,221
Kumamoto	660,343	3,796,440	430,919				4,887,702
Oita	787,519	4,495,834	459,674				5,743,027
Miyazaki	643,278	3,651,481	291,147				4,585,906
Kagoshima	1,185,771	4,546,830	882,023				6,614,624
Okinawa	317,099	3,085,949	849,632				4,252,680
Total of prefectures	73,135,285	189,289,213	52,786,360	1,014,393	1,392,639	200,159	317,818,049
Sapporo			0				0
Sendai			641,496				641,496
Chiba							0
Yokohama	72,561	115,077	533,459				721,097
Kawasaki			846,758				846,758
Nagoya	1,770,868		0				1,770,868
Kyoto	362,952		502,477				865,429
Osaka	1,532,073		1,809,708				3,341,781
Kobe			743,983				743,983
Hiroshima	449,991		648,368				1,098,359
Kitakyushu			445,671				445,671
Fukuoka			0				0
Total of ordinance-designated cities	4,188,445	115,077	6,171,920	0	0	0	10,475,442
Total	77,323,730	189,404,290	58,958,280	1,014,393	1,392,639	200,159	328,293,491

(3) Expenditure for restructuring regional research institutions

For restructuring regional research institutes, about 50,500 million yen in total was spent by the prefectural governments and the ordinance-designated city governments (Table 3-4-5). In the expenditure spent by the prefectural governments, as shown in Fig. 3-4-5, the commerce and industry category accounted for 59% (about 26,100 million yen), being followed by 39% (about 17,200 million yen) of the agriculture, forestry and fisheries category. In the expenditure of the ordinance-designated city governments, the establishment of Biology Research Institute of Yokohama City Government accounted for almost 100% (about 6,400 million yen).

The restructuring of regional research institutes was carried out by 34 prefectures and 2 ordinance-designated cities (Yokohama and Kawasaki). In the expenditure of prefectures, the restructuring in the commerce and industry category (24 prefectures) and the agriculture, forestry and fisheries category (22 prefectures) was carried out by about one half of prefectures, but the restructuring of regional research institutes in the environment & civil engineering and health & sanitation category was carried out by only 11 prefectures spending a small amount of 900 million yen.

Fig. 3-4-5 Breakdown of regional research institutes restructuring expenditure into respective service categories



See Table 3-4-5.

Table 3-4-5 Breakdown of regional research institutes restructuring expenditure into respective service categories

Service category	47 prefectures		12 ordinance-designated cities		Total	
	Restructuring expenditure (in one million yen)	Percentage	Restructuring expenditure (in one million yen)	Percentage	Restructuring expenditure (in one million yen)	Percentage
Commerce and industry	26,093	59.1%	0	0.0%	26,093	51.7%
Agriculture, forestry and fisheries	17,160	38.9%	6,380	99.8%	23,539	46.6%
Environment & civil engineering and health & sanitation	860	1.9%	10	0.2%	870	1.7%
Citizens and life	0	0.0%	0	0.0%	0	0.0%
Education	0	0.0%	0	0.0%	0	0.0%
Planning and general affairs	1	0.0%	0	0.0%	1	0.0%
Total	44,113	100.0%	6,390	100.0%	50,502	100.0%

(4) Expenditure for intensifying the research functions of regional research institutions

For "intensification of research functions of regional research institutes" as a new question of the present survey, about 28,100 million yen was spent (Table 3-4-1) and almost all (40) prefectural governments made efforts for this purpose. Main efforts included the introduction of apparatuses for advanced technologies, holding of study meetings and exchange meetings, joint research projects, upgrading of research by invitation of special researchers and guest researchers, letting researchers study abroad and dispatching researchers to be trained.

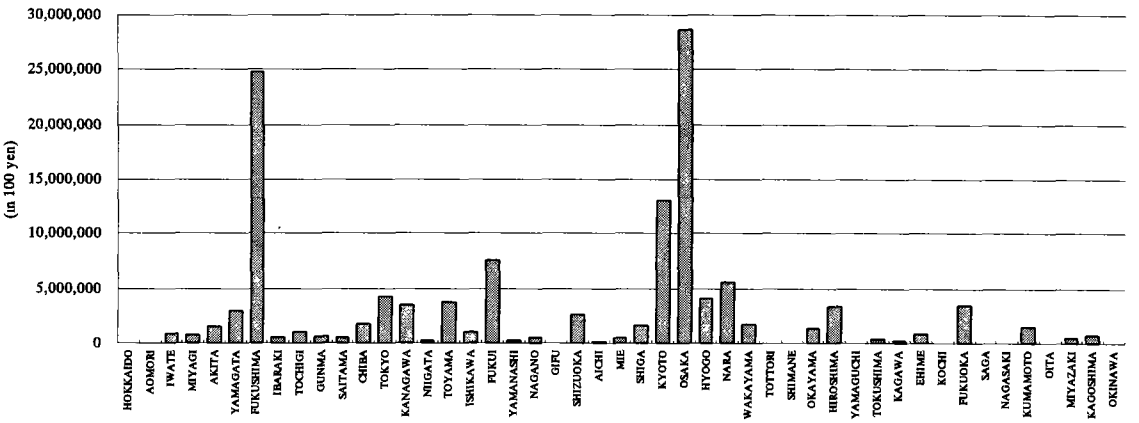
3-5 Expenditure for Institutions of Higher Education in Science and Engineering

The expenditure for institutions of higher education in science and engineering accounted for a high rate of 21% (about 126,200 million yen), next to the expenditure for local public experiment and research institutions in the expenditure for regional science and technology spent by the prefectural governments and the ordinance-designated city governments (Table 3-2-10).

There are 61 local public institutions of higher education in science and engineering (Table 3-5-1), and of them, 27 institutions are of the agriculture and forestry area. In the amounts of expenditure of the respective prefectures (including ordinance-designated cities), Osaka Prefecture which has Osaka Prefectural University and Osaka City University spent the largest amount of about 28,600 million yen, being followed by about 24,800 million yen spent by Fukushima Prefectural Government engaged in the establishment of the University of Aizu, and about 13,000 million yen spent by Kyoto Prefectural Government having Kyoto Prefectural University of Medicine, etc. These prefectures spent more than 10,000 million yen respectively, far more than the other prefectures (Fig. 3-5-1).

Compared with the previous survey (results of FY 1990) on the comparable 45 prefectures, the growth was as high as 122% (Table 3-5-2). The growth is attributable to the fact that Yamagata Prefectural Industry Technology Junior College, Tohoku University of Art & Design (Yamagata Prefecture) and the University of Aizu were opened, and also to the answers of the present survey missed in the previous survey.

Fig. 3-5-1 Expenditure for academies of prefectural governments (including ordinance-designated city governments) (FY 1992)



See Table 3-5-1.

Table 3-5-1 Numbers of and expenditure for academies of prefectural governments (including ordinance-designated city governments) (FY 1992)

(In 1000 yen)

Name of prefecture	Number of public institutions	Amount of money (including the expenditure for private institutions)
Hokkaido	0	44,960
Aomori	0	0
Iwate	1	832,827
Miyagi	1	708,889
Akita	1	1,456,565
Yamagata	2	2,982,664
Fukushima	3	24,763,825
Ibaraki	1	532,506
Tochigi	1	945,810
Gunma	1	626,290
Saitama	1	514,767
Chiba	2	1,676,193
Tokyo	1	4,232,785
Kanagawa	3	3,423,160
Niigata	2	305,338
Toyama	1	3,754,481
Ishikawa	1	991,294
Fukui	2	7,515,627
Yamanashi	1	232,676
Nagano	2	475,151
Gifu	0	0
Shizuoka	3	2,586,919
Aichi	1	162,000
Mie	1	508,337
Shiga	1	1,594,877
Kyoto	3	13,034,067
Osaka	3	28,599,217
Hyogo	3	4,142,426
Nara	2	5,534,403
Wakayama	1	1,738,409
Tottori	0	0
Shimane	0	0
Okayama	3	1,329,836
Hiroshima	1	3,311,934
Yamaguchi	0	0
Tokushima	1	333,218
Kagawa	1	263,186
Ehime	1	862,574
Kochi	0	0
Fukuoka	4	3,480,061
Saga	0	0
Nagasaki	0	0
Kumamoto	2	1,457,079
Oita	1	1,500
Miyazaki	1	470,285
Kagoshima	1	805,183
Okinawa	0	0
Total	61	126,231,319

Table 3-5-2 Expenditure for academies spent by 45 prefectural governments in FY 1990 and FY 1992 (excluding Tokyo Metropolis, Nagasaki Prefecture and ordinance-designated cities)

(In 1000 yen)

Name of prefecture	FY 1990 (in 1000 yen)	FY 1992 (in 1000 yen)	FY 1992/FY 1990
Hokkaido	1,943,228	44,960	2.3%
Aomori			
Iwate	681,998	832,827	122.1%
Miyagi	797,122	708,889	88.9%
Akita	1,148,327	1,456,565	126.8%
Yamagata	300,163	2,982,664	993.7%
Fukushima	8,071,623	24,763,825	306.8%
Ibaraki	593,587	532,506	89.7%
Tochigi	631,361	945,810	149.8%
Gunma	617,614	626,290	101.4%
Saitama		514,767	
Chiba	627,815	1,676,193	267.0%
Tokyo	—	—	—
Kanagawa	303,965	1,320,795	434.5%
Niigata	361,782	305,338	84.4%
Toyama	4,219,765	3,754,481	89.0%
Ishikawa	1,007,939	991,294	98.3%
Fukui	7,145,101	7,515,627	105.2%
Yamanashi		232,676	
Nagano	252,588	475,151	188.1%
Gifu	80,870		0.0%
Shizuoka	2,770,506	2,586,919	93.4%
Aichi		162,000	
Mie	459,956	508,337	110.5%
Shiga	1,662,317	1,594,877	95.9%
Kyoto	1,221,544	12,954,978	1060.5%
Osaka	12,012,773	16,756,635	139.5%
Hyogo	9,307,606	4,142,426	44.5%
Nara	4,515,347	5,534,403	122.6%
Wakayama	17,728,326	1,738,409	9.8%
Tottori			
Shimane			
Okayama	874,047	1,329,836	152.1%
Hiroshima	978,336	952,899	97.4%
Yamaguchi			
Tokushima	296,514	333,218	112.4%
Kagawa	384,744	263,186	68.4%
Ehime	878,530	862,574	98.2%
Kochi			
Fukuoka	2,828,199	3,480,061	123.0%
Saga			
Nagasaki	—	—	—
Kumamoto	1,288,821	1,457,079	113.1%
Oita	4,000	1,500	37.5%
Miyazaki	169,970	470,285	276.7%
Kagoshima	768,354	805,183	104.8%
Okinawa			
Total	86,934,738	105,615,463	121.5%

3-6 R&D (support) Institutions such as Juridical Foundations

This section describes the conditions of R&D institutions and R&D support institutions such as juridical foundations and third sectors increasingly established in recent years in respective regions based on the investment and endowment by local authorities.

(1) Trends in the establishment of R&D (support) institutions

After the enforcement of the Law for Accelerating Regional Development Based on High-Technology Industrial Complexes (Technopolis Law) in 1983, as shown in Table 3-6-1, various schemes to promote the upgrading of technologies and the establishment of R&D foundations were formulated by ministries.

Table 3-6-1 National government's schemes deeply concerned with the establishment of regional R&D foundations

Fiscal year	Scheme	Ministry or Agency	Applicable Law
1983	Technopolis	Ministry of International Trade and Industry	Law for Developing and Promoting Regions Replete with Manufacturing Industry of Advanced Technologies (Technopolis Law)
1985	Promotion of research on foundation technologies	Ministry of International Trade and Industry and Ministry of Posts and Telecommunications	Law for Facilitating Research on Foundation Technologies
1986	Research Core	Ministry of International Trade and Industry	Temporary Law for Promoting the Establishment of Specific Facilities by Use of Private Businesses" Abilities
1986	Bio-oriented Technology Research Institution	Ministry of Agriculture, Forestry and Fisheries	Bio-oriented Technology Research Advancement Institution Law
1987	Drug fund	Ministry of Health and Welfare	The Adverse Drug Sufferings Relief Fund Law
1988	Brains Location	Ministry of International Trade and Industry	Law to Promote the Group-Sitting of Designated Types of Business Contributing to More Sophisticated Local Industrial Structures (Brains Location Law)
1988	Establishment of leading and fundamental regional science and technology facilities	Science and Technology Agency	Multi-polar Patterns National Land Formation Promotion Law
1988	Industrial technology research foundation establishment project	Ministry of International Trade and Industry	Law Concerning the Establishment of System for Research and Development in the Field of Industrial Technology (Industry Technology Law)

As shown in Table 3-6-2, based on these laws, R&D institutions and R&D support institutions were established nation-widely under the investment and endowment by local authorities. On the other hand, R&D (support) institutions based on the efforts of local authorities without resorting to the national government's schemes were also concurrently established. One hundred and sixty six R&D (support) institutions were established under the investment or endowment by any prefectural government or ordinance-designated city government by the end of 1992, which consisted of 91 institutions without resorting to any national scheme and 75 institutions based on any national scheme. Among the institutions established based on any national scheme, the number of institutions established based on the Technopolis Law and the Brains Location Law was the largest 39, being followed by 11 institutions based on the bio-oriented research institution scheme and 10 institutions based on the research core scheme.

As for the chronological changes of establishment, as shown in Fig. 3-6-1, the 22 institutions established by FY 1982 were R&D (support) institutions based on the efforts of local authorities alone without resorting to any national scheme, except one institution (Hamamatsu Region Technopolis Promotion Organization). After 1983, both the R&D (support) institutions resorting to any national scheme and the R&D (support) institutions by the sole efforts of local authorities sharply increased. Furthermore, in two years of FY 1991 and 1992 after FY 1990 (year of the previous survey), 32 institutions were established, and among them, the R&D (support) institutions established with the efforts of local authorities alone increased. So, what will occur henceforth must be carefully watched.

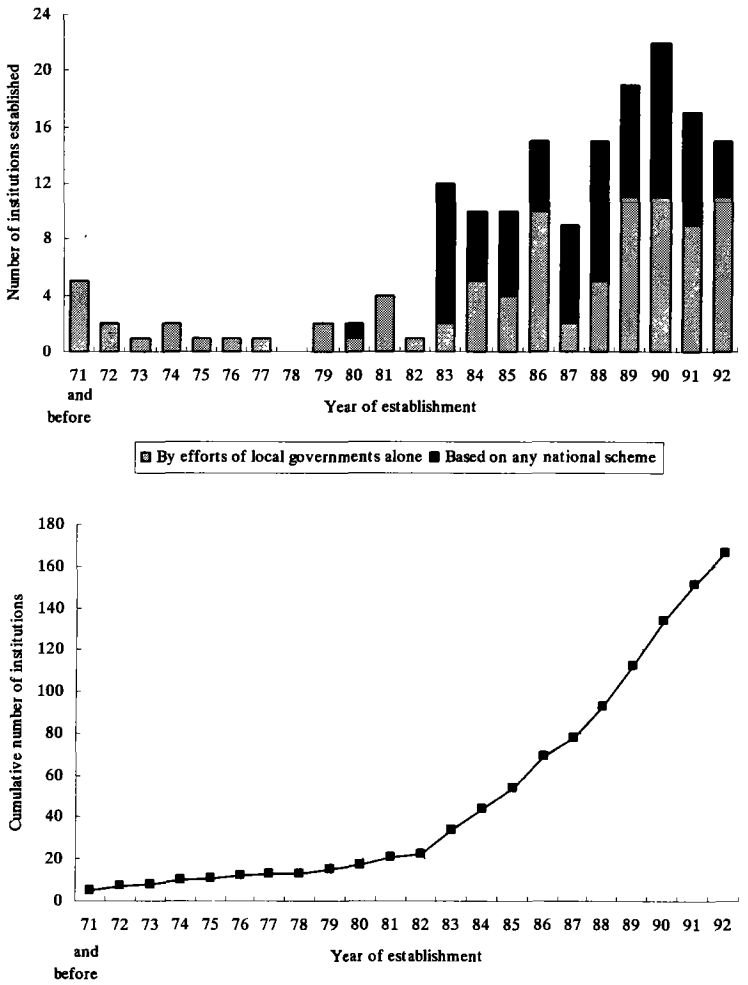
Table 3-6-2 Numbers of R&D (support) institutions based on the investment (endowment) by prefectural governments and ordinance-designated city governments (as of the end of FY 1992)

	Number of institutions	Percentage
By efforts of local governments alone	91	54.8%
Based on any national scheme	75	45.2%
Total	166	100.0%

Breakdown

Name of scheme	Number of institutions	Percentage
Technopolis and brains location	39	52.0%
Bio-oriented research institution	11	14.7%
Research core	10	13.3%
Establishment of leading and fundamental regional science and technology facilities	9	12.0%
Foundation technology research promotion	2	2.7%
Others	4	5.3%
Sub-total	75	100.0%

Fig. 3-6-1 Establishment of R&D (support) institutions based on the investment (endowment) by any prefectural government or ordinance-designated city government

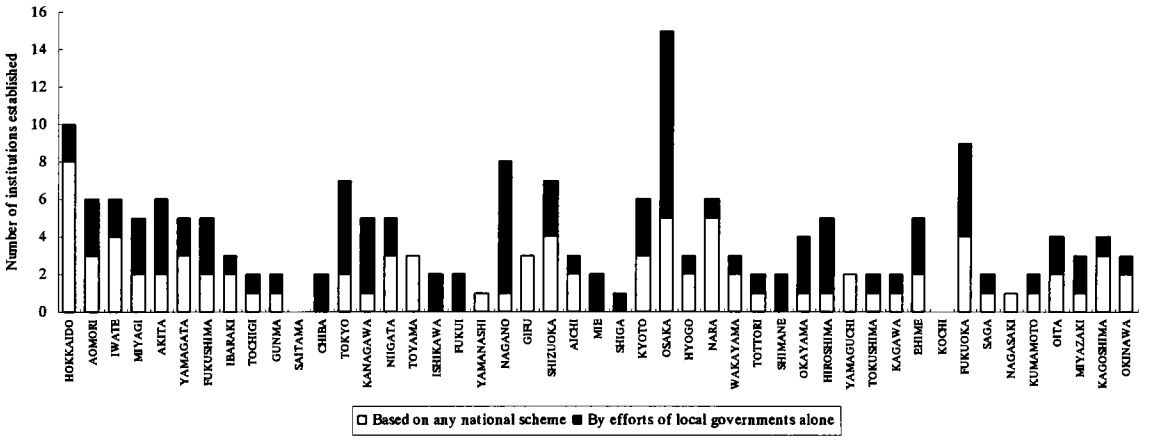


See Table 3-6-3.

As shown in Fig. 3-6-2, among respective prefectures, R&D (support) institutions were established under the investment and endowment by any prefectural government or ordinance-designated city government in 45 prefectures excluding Saitama and Kochi Prefectures. Fifteen institutions of Osaka Prefecture were largest, being followed by 10 institutions of Hokkaido and 9 institutions of Fukuoka Prefecture in this order.

As shown in Table 3-6-4 (2), the R&D (support) institutions established with the efforts of local governments alone included institutions respectively established for promoting the establishment of a technopolis in the entire prefecture, institutions established for complementing national schemes such as institutions for upgrading technologies in the local governments not regionally designated as technopolis, etc., and institutions established for regional strategy. Furthermore, institutions with science and technology in their names such as Ibaraki Science and Technology Foundation, Kanagawa Academy Science and Technology Foundation, Fukushima Industry, Science and Technology Foundation, Shizuoka Science and Technology Foundation and Hyogo Science and Technology Association can also be seen.

Fig. 3-6-2 Numbers of R&D (support) institutions based on the investment (endowment) by any prefectural government or ordinance-designated city government



See Table 3-6-5.

Table 3-6-3 Chronological changes in the establishment of R&D (support) institutions based on the investment (endowment) by any prefectural government or ordinance-designated city governments

	Year of establishment																					
Fiscal year	71 and before	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	
By efforts of local authority alone	5	2	1	2	1	1	1	0	2	1	4	1	2	5	4	10	2	5	11	11	9	11	91
Based on any national scheme	0	0	0	0	0	0	0	0	0	1	0	0	10	5	6	5	7	10	8	11	8	4	75
Total	5	2	1	2	1	1	1	0	2	2	4	1	12	10	10	15	9	15	19	22	17	15	166
Cumulative number of institutions	5	7	8	10	11	12	13	13	15	17	21	22	34	44	54	69	78	93	112	134	151	166	

Table 3-6-4 R&D (support) institutions based on the investment (endowment) by any prefectural government or ordinance-designated city government

(1) R&D (support) institutions based on any national scheme

Scheme	Number of institutions	Prefecture or ordinance-designated city	Year of establishment	Name
Technopolis	26	Hokkaido	1984	Technopolis Hakodate Technology Promotion Association
		Hokkaido	1988	Doh-oh Technopolis Development Foundation
		Aomori	1984	Aomori Technopolis Development Organization
		Iwate	1986	Iwate Techno Foundation
		Miyagi	1985	Miyagi Techno Foundation
		Akita	1983	Akita Technopolis Development Organization
		Yamagata	1985	Yamagata Technopolis Foundation
		Fukushima	1986	Koriyama Area Technopolis Promotion Organization
		Tochigi	1991	Tochigi Prefectural Industrial Technology Promotion Association
		Niigata	1983	Shinanogawa Technopolis Development Organization ("Nagaoka Research Core" was designated as a research core in 1989)
		Toyama	1983	Toyama Technology Development Foundation
		Yamanashi	1986	Yamanashi 21st Century Industrial Development Organization
		Nagano	1985	Asama Technopolis Development Organization
		Shizuoka	1980	Organization for Hamamatsu Technopolis
		Hyogo	1984	Harima Technopolis Development Foundation
		Okayama	1983	Okayama New Technology Foundation (also designated as a brain location)
		Hiroshima	1992	Hiroshima Industrial Technology Organization
		Yamaguchi	1983	Yamaguchi Industrial Technology Development Organization
		Kagawa	1984	Kagawa Prefectural Industrial Technology Promotion Foundation
		Ehime	1986	Ehime Technopolis Foundation
		Fukuoka/Saga	1983	Kurume-Tosu Area Technological Promotion Center
		Nagasaki	1984	Nagasaki Technopolis Foundation
		Kumamoto	1983	Kumamoto Technopolis Foundation
		Oita	1983	Oita Area Technological Promotion Foundation
		Miyazaki	1985	Miyazaki Industrial Technology Information Center
		Kagoshima	1983	Kagoshima Industry Foundation
Research core	11	Hokkaido	1988	Eniwa Research Business Park Co., Ltd.
		Miyagi	1987	Technoplaza Miyagi Co., Ltd.
		Ibaraki	1987	Tsukuba Center Inc.
		Tokyo	1993	Tokyo Fashion Town
		Kanagawa	1986	KSP Co., Ltd.
		Toyama	1988	Toyama Center for Industrial Creativity
		Aichi	1990	Science Create Co., Ltd.
		Osaka	1988	Senri Life Science Center
		Hyogo	1991	Ehric Co., Ltd.
		Fukuoka	1987	Kurume Research Park Co., Ltd.
		Fukuoka	1991	Fukuoka SRP Co., Ltd.

R&D (support) institutions based on any national scheme (continued)

Scheme	Number of institutions	Prefecture or ordinance-designated city	Year of establishment	Name
Brain location	13	Hokkaido	1992	Asahikawa Research Center
		Aomori	1989	Intelligent Plaza Hachinohe
		Ibaraki	1990	Hitachinaka Technocenter Co., Ltd.
		Gunma	1991	Gunma Industry Upgrading Center Co., Ltd.
		Toyama	1992	Toyama Training Layout and Evaluation Institute
		Shizuoka	1989	Hamana Lake International Brain Center Co., Ltd.
		Wakayama	1990	Wakayama Research Lab. Co., Ltd.
		Tottori	1989	New Industry Creation Center Co., Ltd.
		Tokushima	1989	Tokushima Comprehensive Health Sciences Center Inc.
		Fukuoka	1990	Kitakyushu Technology Center Co., Ltd.
		Oita	1983	Oita Prefectural Advanced Technology Development Research Institute
		Kagoshima	1990	Kagoshima Brain Center
		Okinawa	1990	Tropical Technology Center Co., Ltd.
Foundation technology research promotion	2	Yamagata	1992	Biophotonic Information Laboratories Ltd.
		Kyoto/Nara	1985	Advanced Telecommunications Research Institute International (ATR)
Bio-oriented research institution	11	Hokkaido	1987	Hokkaido Green-Bio Institute Co., Ltd. (till 1992)
		Aomori	1990	Research Institute for Glycotechnology (till 1996)
		Iwate	1988	Sun Rock Inc. (till 1994)
		Akita	1991	Fungi Function Development Research Institute Co., Ltd. (till 1999)
		Yamagata	1989	Research Institute for Functional Peptides (till 1995)
		Tokyo	1987	Processed Rice Breeding Research Institute Co., Ltd. (till 1993)
		Niigata	1991	Plant Biological Defense System Laboratories (till 1998)
		Wakayama	1987	Wakayama Agricultural Biology Research Center Co., Ltd. (till 1995)
		Ehime	1990	Marine Algae Resource Research Institute Co., Ltd. (till 1996)
		Kagoshima	1987	Okinoerabu Bulb Biology Research Institute Co., Ltd. (till 1992)
		Okinawa	1990	Okinawa Orchid Research Institute Co., Ltd. (till 1996)
Drug fund	1	Fukushima	1991	Drug Production Technology Research Institute Co., Ltd.
Establishment of leading and fundamental regional science and technology facilities	9	Hokkaido	1991	Okhotsk Floating Ice Science Research Institute Co., Ltd.
		Niigata	1989	Applied Laser Engineering Center Co., Ltd.
		Hokkaido/ Gifu	1988	Japan Microgravity Center (JAMIC) and Micro-Gravity Laboratory of Japan (established in 1990)
		Iwate/ Shizuoka	1988	Research Center for the Industrial Utilization of Marine Organisms and Marine Biotechnology Research Institute Co., Ltd.
		Gifu/ Yamaguchi	1989	Japan Ultrahigh Temperature Materials Research Institute
		Osaka	1988	Ion Engineering Center Corporation. and Ion Engineering Research Corporation.
Japan Keirin Association	1	Aichi	1985	Japan Fine Ceramics Center
Japan Autorace Association	1	Kyoto/Nara /Osaka	1990	Research Institute of Innovative Technology for the Earth
Development Bank	1	Kyoto/Nara	1989	Keihanna Co., Ltd.
Total	76*			* Including Tokyo Fashion Town established in 1993

(2) R&D (support) institutions without resorting to any national scheme

Prefecture or ordinance-designated city	Year of establishment	Name
Hokkaido	1986	Muroran Technocenter
	1992	Asahikawa Seikatsu Bun, ka Sangyo Shinkou Kyoukai
Tohoku (7 prefectures)	1988	Intelligent Cosmos Research Co., Ltd.
Aomori	1985	Hachinohe Regional Advanced Technology Promotion Center Foundation
	1990	Institute for Environment Sciences
Iwate	1991	Iwate Biotechnology Research Center
Miyagi	1966	Tohoku Industrial Technology Development Association
	1988	Suisei Agriculture Promotion Association
Akita	1972	Akita Prefectural Chemical Analysis Center
	1990	Akita Prefectural Resource Technology Development Organization (Metals and Mining Training and Technology Center)
	1992	Akita Prefectural Lumber Production Organization
Yamagata	1947	Yamagata University Industry Research Institute
Fukushima	1984	Fukushima Industrial Technology Promotion Foundation
	1992	Fukushima Research and Education Foundation
Ibaraki	1989	Ibaraki Science and Technology Foundation
Tochigi	1988	Tochigi General Research Organization
Gunma	1991	Gunma Industrial Technology Foundation
Chiba	1985	Chiba Industrial Technology Center
	1990	Kazusa DNA Research Institute
Tokyo	1973	Tokyo Institute of Psychiatry
	1975	The Tokyo Metropolitan Institute of Medical Science
	1980	Association for the Development of Earthquake Prediction
	1981	Tokyo Metropolitan Institute of Gerontology
	1981	Tokyo Metropolitan Institute for Neuroscience
Kanagawa	1945	Space Science Promotion Association
	1984	Kihara Memorial Yokohama Foundation for the Advancement of Life Sciences
	1989	Kanagawa Academy of Science and Technology Foundation
	1989	Kanagawa High Technology Foundation
Niigata	1985	Niigata Prefectural Central Region Local Industry Promotion Center
Ishikawa	1987	Research and Development Subsidy Fund
	1990	Ishikawa Prefectural Industry Promotion Fund Association (Ishikawa Trial Center designated as a brain site)
Fukui	1986	Fukui Association of Industry Technology
	1992	Fukui Prefectural University and Other Academy Promotion Fund
Nagano	1972	Nagano Prefectural Architectural Technology Center
	1981	Association for the Development of Earthquake Prediction
	1986	Nagano Prefectural Techno-high land Development Organization
	1986	Iii Region Local Industry Promotion Center
	1987	Nagano Prefectural Original Seeds Center
	1989	Matsumoto Software Development Center
	1990	Kamiina Industry Promotion Association (Ina Technology Formation Center)
Shizuoka	1981	Shizuoka Prefectural Agriculture Promotion Fund Association
	1986	Shizuoka Prefectural Research and Education Foundation
	1991	Shizuoka Science and Technology Foundation
Aichi	1991	Aichi Prefectural Agriculture Promotion Fund
Mie	1989	International Center for Environment Technology Transfer
	1990	Mie Prefectural Industrial Technology Advancement Center
Shiga	1984	Shiga Prefectural Manufacturing Industry Technology Promotion Association
Kyoto city	1979	Kyoto Hygiene Test Research Center
	1988	Advanced software Technology & Mechatronics Research Institute of Kyoto
Kyoto	1991	Kyoto Industrial Technology Foundation

R&D (support) institutions without resorting to any national scheme (continued)

Prefecture or ordinance-designated city	Year of establishment	Name
Osaka city	1964	Association of Osaka City University
	1970	Kansai Institute of information Systems
Osaka	1986	Osaka Cancer Preventive Examination Center
Osaka city	1986	Osaka Bio-science Institute
	1989	Osaka City Urban Type Industry Promotion Center
Osaka	1990	Senri Life Science Foundation
	1990	Osaka Prefectural Research and Development Oriented Businesses Promotion Foundation
Osaka city	1990	Urban Engineering Information Center
	1991	Laboratories of Image Information Science and Technology
	1991	Global Environment Center
Hyogo	1992	Hyogo Science and Technology Association
Nara	1991	Support Foundation for Nara Institute of Science and Technology
Wakayama	1990	Wakayama Technology Foundation
Tottori	1986	Tottori Association of Industry Technology
Shimane	1976	Shimane Incurable Disease Research Institute
	1986	Shimane Technology Promotion Association
Okayama	1974	Okayama Environment Preservation Corporation
	1986	Okayama Agriculture Development Research Institute
	1989	Okayama Ceramics Technology Promotion Foundation (Okayama Ceramics Center)
Hiroshima	1989	Hiroshima Agriculture Gene Bank
	1990	Hiroshima Techno Plaza Corporation (Leading Technology Joint Research Center designated as a brain location)
	1992	Hiroshima Industry Promotion Center
Hiroshima city	1992	Hiroshima City Industry Promotion Center
Tokushima	1985	Tokushima Research Institute for Original Technology
Kagawa	1992	Kagawa Industrial Intelligent Center
Ehime	1974	Ehime Prefectural Health and Medical Service Foundation
	1984	Ehime Prefectural Technology Development Promotion Foundation
	1991	Toyo Industry Creation Center
Kitakyushu city	1977	Kitakyushu Cities Association
Fukuoka	1989	Fukuoka Industry, Science and Technology Foundation
Kitakyushu city	1989	International East Asia Research Center
	1989	Kitakyushu City Industrial Technology Foundation
Fukuoka	1992	Iizuka Research and Development Organization
Saga	1988	Saga Industrial Technology Information Center
Kumamoto	1983	Kumamoto Technopolis Foundation - Electronics Applied Technology Research Institute
Oita	1983	Oita Advanced Technology Support Foundation
	1992	Hyper Network Society Research Institute
Miyazaki	1979	Miyazaki Mechanical Technology Promotion Association
	1992	Miyazaki Prefectural Aquaculture Association
Kagoshima	1984	Kagoshima Prefectural Fine Ceramic Product Development Association
Okinawa	1982	Okinawa Construction Technology Foundation
Total		91

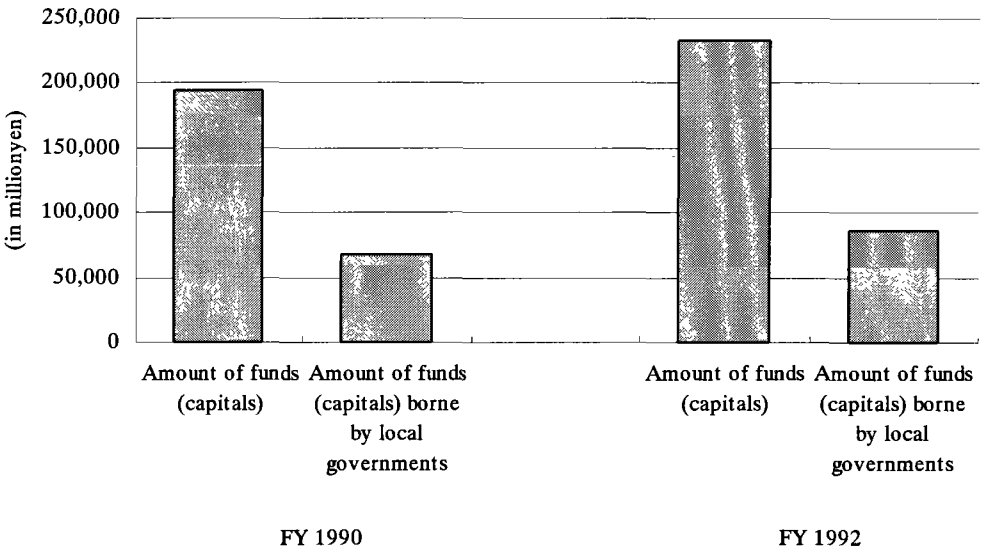
Table 3-6-5 Number of R&D (support) institutions based on the investment (endowment) by any prefectural government or ordinance-designated city

Prefecture	Total number of institutions	Number of institutions established with efforts of prefectural or city government alone	Remarks
Hokkaido	10	2	Underground Zero Gravity Experiment Center and Japan Zero Gravity General Research Institute are doubly counted with Gifu Prefecture.
Aomori	6	3	
Iwate	6	2	Marine Biotechnology Research Institute, and for the Industrial Utilization of Marine Organisms Research Center are doubly counted with Shizuoka Prefecture.
Miyagi	5	3	
Akita	6	4	
Yamagata	5	2	
Fukushima	5	3	
Ibaraki	3	1	
Tochigi	2	1	
Gunma	2	1	
Saitama	0	0	
Chiba	2	2	
Tokyo	7	5	* Including Tokyo Fashion Town established in 1993.
Kanagawa	5	4	
Niigata	5	2	
Toyama	3	0	
Ishikawa	2	2	
Fukui	2	2	
Yamanashi	1	0	
Nagano	8	7	
Gifu	3	0	Underground Zero Gravity Experiment Center and Japan Zero Gravity General Research Institute are doubly counted with Hokkaido, and Japan Ultra-high Temperature Materials Research Institute is doubly counted with Yamaguchi Prefecture.
Shizuoka	7	3	Marine Biotechnology Research Institute, and for the Industrial Utilization of Marine Organisms Research Center are doubly counted with Iwate Prefecture.
Aichi	3	1	
Mie	2	2	
Shiga	1	1	
Kyoto	6	3	International Telecommunication Foundation Technology Research Institute is doubly counted with Nara Prefecture.
Osaka	15	10	Ion Engineering Research Institute and Ion Engineering Research Center are doubly counted with Nara Prefecture.
Hyogo	3	1	
Nara	6	1	Advanced Telecommunications Research Institute International is doubly counted with Kyoto Prefecture, and Ion Engineering Research Corp. and Ion Engineering Research Center Corp. are doubly counted with Osaka Prefecture.
Wakayama	3	1	
Tottori	2	1	
Shimane	2	2	
Okayama	4	3	
Hiroshima	5	4	
Yamaguchi	2	0	Japan Ultra-high Temperature Materials Research Institute is doubly counted with Gifu Prefecture.
Tokushima	2	1	
Kagawa	2	1	
Ehime	5	3	
Kochi	0	0	
Fukuoka	9	5	Kurume-Tosu Area Technological Promotion Center is doubly counted with Saga Prefecture.
Saga	2	1	Kurume-Tosu Area Technological Promotion Center is doubly counted with Fukuoka Prefecture.
Nagasaki	1	0	
Kumamoto	2	1	
Oita	4	2	
Miyazaki	3	2	
Kagoshima	4	1	
Okinawa	3	1	
Total	186	97	In addition to the above, seven prefectural governments of Tohoku District invested in Intelligent Cosmos Research Organization, and Kyoto, Osaka and Nara Prefectural Governments invested in Keihanna and Research Institute of Innovative Technology for the Earth.
	167 institutions	91 institutions	* Including Tokyo Fashion Town established in 1993.

(2) Funds (capitals), operating expenditure, etc. of research institutions and R&D support institutions such as third sectors and juridical foundations

As shown in Fig. 3-6-3, for the 139 R&D (support) institutions totalized from the answers from the prefectural governments and ordinance-designated city governments, the funds (capitals) amounted to about 232,400 million yen. The percentage of the funds (capitals) borne by local governments was 37% (about 86,500 million yen), being higher than that in the previous survey (results of FY 1990) by 2%.

Fig. 3-6-3 Funds, etc. of R&D (support) institutions

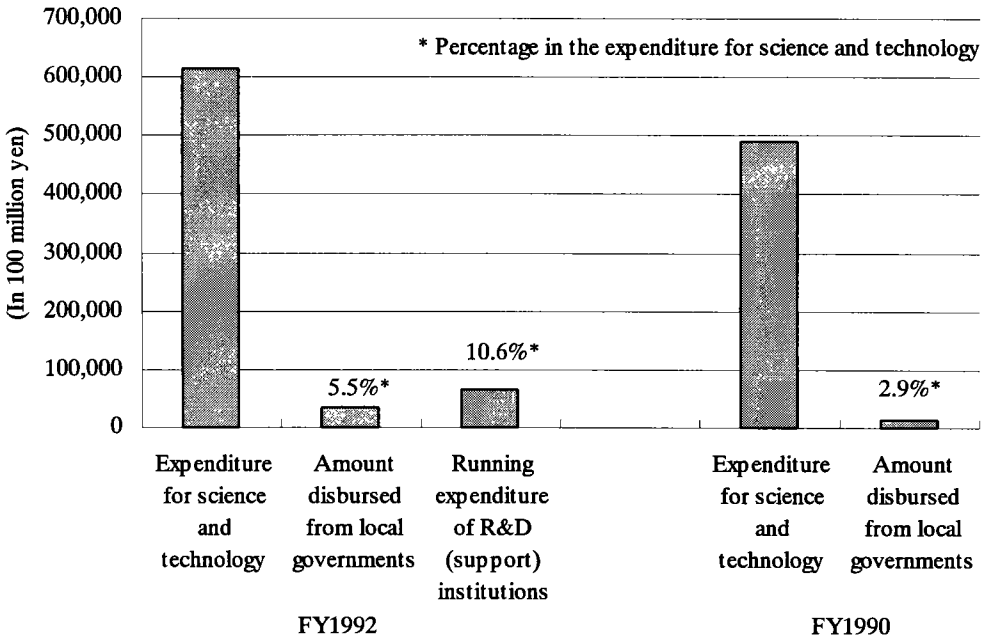


See Table 3-6-6.

As shown in Fig. 3-6-4, the amount disbursed from local governments for the R&D (support) institutions in FY 1992 was about 33,700 million yen, accounting for 5.5% of the total amount of expenditure for science and technology (2.9% in the previous survey). In the present survey, the amount disbursed from the R&D (support) institutions was investigated as an amount outside the expenditure for science and technology. It was about 65,100 million yen, corresponding to 11% of the total amount of expenditure for science and technology.

Of the about 33,700 million yen disbursed from local governments for R&D (support) institutions, 11,800 million yen corresponding to about one third of it was invested or endowed, and 21,900 million yen corresponding to the remaining about two thirds was subsidies and contract money for running the institutions. So, 21,900 million yen corresponding to about one third of about 65,100 million yen disbursed from the R&D (support) institutions was covered by the expenditure from local governments. The reason is estimated to be that since the interests of deposits and saving were kept low for a long period of time, the expenditure from local governments for assisting the running expenditure and contracted activities to the R&D (support) institutions other than the investment and endowment increased. Furthermore, since the establishment of R&D (support) institutions under the investment or endowment by local governments is increasing, it is predicted that the expenditure for R&D (support) institutions will increase also henceforth, and the percentage in the total amount of expenditure for science and technology will also increase.

Fig. 3-6-4 Amounts disbursed from local governments to R&D (support) institutions



See Table 3-6-6.

Table 3-6-6 Funds, etc. of R&D (support) institutions established based on the investment (endowment) by any prefectural government or ordinance-designated city government

Item	FY 1990	FY 1992
Number of institutions	121	139
Amount of funds (capitals) (a)	194,700 million yen	232,400 million yen
Amount borne by local governments in the amount of funds (capitals) (b)	67,700 million yen	86,500 million yen
(b)/(a)	34.8%	37.2%
Amount disbursed from local governments to R&D (support) institutions in the fiscal year concerned (c)	14,300 million yen	33,700 million yen
(c)/(e)	2.9%	5.5%
Running expenditure of R&D (support) institutions in the fiscal year concerned (d)	-	65,100 million yen
(d)/(e)		10.6%
Expenditure for science and technology (e)	492,400 million yen	614,000 million yen

Note: Data of FY 1990 are of 45 prefectures and 7 ordinance-designated cities. Data of FY 1990 include 9 institutions doubly counted.

(3) R&D (support) funds

In addition to the above R&D (support) institutions, seven governments of Ibaraki, Toyama, Nagano, Shiga, Osaka and Kagawa Prefectures and Osaka City created funds of about 6,200 million yen for promotion of science and technology (Table 3-6-7).

Table 3-6-7 Various funds for promotion of science and technology created by prefectural governments and a city government

Name of prefecture	Title of fund	Fund (target amount) (in 1000 yen)	Competent administrative division	Activities carried out by use of fund
Ibaraki	Manufacturing Industry Technology Promotion Fund	1,492,042	Commerce & Industry and Labor Dept.	(Target amount of fund: 1,500 million yen) • New Product and New Technology Development Subsidy Scheme • Automation Apparatus, Etc. Development Subsidy Scheme • Engineer Dispatch and Training Subsidy Scheme • Subcontractor Technology Training Subsidy Scheme • New Technology Exchange and Training Subsidy Scheme • Industrial, Academic and Governmental Joint Research Scheme
Toyama	Technology Promotion Fund	1,065,250	Commerce & Industry and Labor Dept.	Training and guidance, technology exchange, research, information presentation, etc.
Nagano	Fund in Nagano Prefectural Science Promotion Fund	120,469	General Affairs Dept.	* Creation of fund by endowment (target amount of fund: 200 million yen) Science Research Fund Subsidy Scheme, presentation of living science lecture, etc.
Shiga	Shiga Prefectural Industry Technology Promotion Fund	744,710	Commerce & Industry and Labor Dept.	(As of October, 1993) • Appropriated as a fund for manufacturing industry promotion scheme subsidies • Enriching apparatuses for training • Opening of Technology Consultation Counter
Osaka	Osaka Prefectural University Scholarship Promotion Fund	272,000	Osaka Prefectural University	• Invitation and dispatch of researchers • Subsidies for making papers published in overseas academic journals • Holding of international symposia
Kagawa	Kagawa Prefectural Industry Technology Development Fund	1,382,190	Commerce & Industry and Labor Dept.	• Development and promotion of industry technologies • Promotion of small and medium-sized businesses
Osaka City	Osaka City University Promotion Fund	1,151,909	Osaka City University Secretariat	Subsidies for specific studies, subsidies for dispatching postgraduate students to international meetings, etc., payment of overseas traveling expenses for teachers, payment of scholarships for undergraduates, etc.
Total	7	6,228,570		

3-7 Support of R&D Activities

The support of R&D activities was investigated in reference to the following four major items as shown in Table 3-7-1.

(a) "Promotion of research at medical institutions such as local public and private hospitals, etc."

(b) "Promotion of research exchange" (questions concerning "joint research with national research institution", "research exchange among industrial, academic and governmental circles", "system for presenting the science and technology information from outside the region" and "promotion of private research exchange")

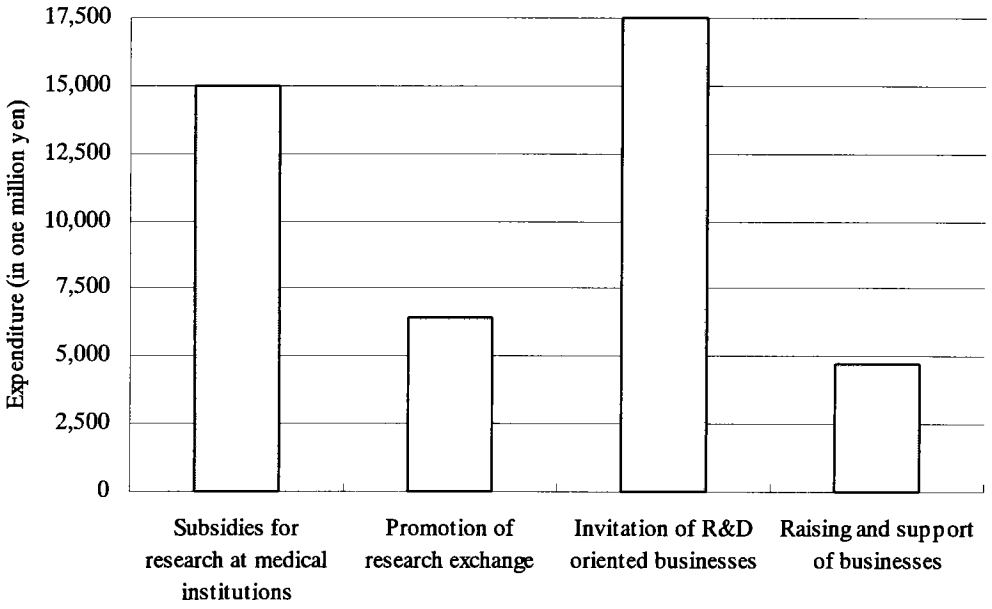
(c) "Invitation of R&D oriented businesses"

(d) "Raising and support of R&D oriented businesses" (questions concerning "raising of R&D oriented businesses and support for upgrading technological development of local businesses", "consultation and guidance on technologies for local businesses" and "public invitation type R&D scheme")

As for the expenditure for the respective survey items, the expenditure for the invitation of R&D oriented businesses was about 17,500 million yen, being followed by about 15,000 million yen for the promotion of research at medical institutions, about 6,400 million yen for promotion of research exchange, and about 4,700 million yen for the raising and support of R&D businesses in this order. The total of the four items was about 43,700 million yen, accounting for 7% of the total amount of expenditure for science and technology. It also corresponded to 170% of about 25,700 million yen found in the previous survey (results of FY 1990).

The answers showed that the "finance for the invitation of R&D oriented businesses" amounted to about 31,000 million yen, and that the "finance for the raising of R&D oriented businesses and support for upgrading technological development of local businesses" amounted to about 30,000 million yen.

Fig. 3-7-1 Expenditure for R&D activities (FY 1992)



See Table 3-7-1.

The efforts of respective prefectural governments (ordinance-designated municipal governments) for the respective items were as described below (Fig. 3-7-2).

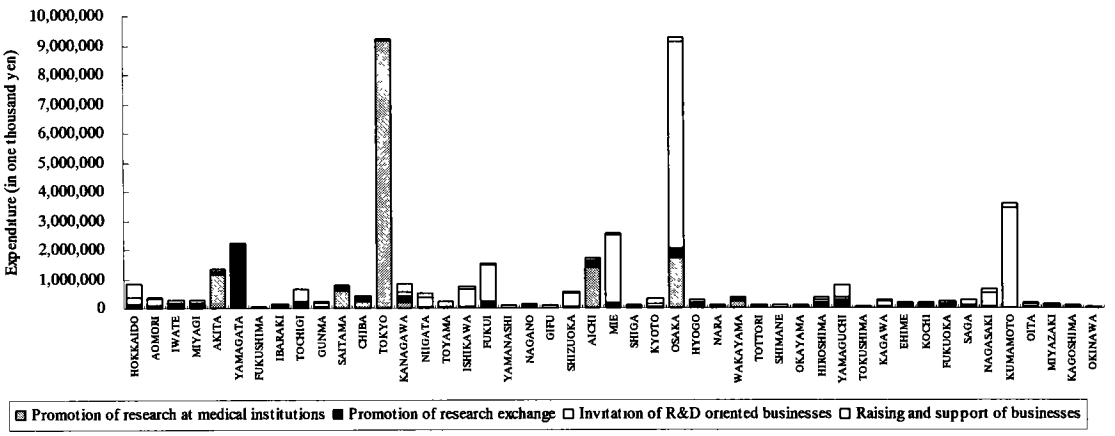
According to the answers on the expenditure for "promotion of research at medical institutions", Tokyo Metropolis having medical research institutes as juridical foundations spent a conspicuously large amount of 9,200 million yen, compared to the other prefectures. It is followed by about 1,600 million yen of Osaka Prefecture having Osaka Medical Center for Cancer and Cardiovascular Diseases, etc., about 1,400 million yen of Aichi Prefecture having Aichi Cancer Center Research Institute, and about 1,200 million yen of Akita Prefecture having Research Institute for Brain and Blood Vessels-Akita in this order. These four prefectures alone exceeded 1,000 million yen.

According to the answers on the expenditure for "promotion of research exchange", Yamagata Prefecture spent about 2,200 million yen because of Yamagata Prefectural Advanced Technology Research and Development Center establishing project. Except it, only Osaka Prefecture which promoted the knowledge harmonization for promotion of private research exchange (191 million yen) spent more than 300 million yen (324 million yen).

According to the answers on the expenditure for "invitation of R&D oriented businesses", Osaka Prefecture which promoted Cosmopolis Plan (establishment of High Technology Research Park in Senshu Region) spent about 7,000 million yen. It was followed by about 3,400 million yen of Kumamoto Prefecture which promoted the construction of Second High Technology Park, about 2,300 million yen of Mie Prefecture having Suzuka-sanroku Research Park Center, etc., and about 1,300 million yen of Fukui Prefecture which granted subsidies for encouraging the siting of enterprises. These four prefectures alone exceeded 1,000 million yen.

According to the answers on the expenditure for "raising and support of R&D oriented businesses", 445 million yen of Hokkaido was followed by 430 million yen of Tochigi Prefecture and 420 million yen of Yamaguchi Prefecture in this order.

Fig. 3-7-2 Expenditure spent by prefectural governments (including ordinance-designated city governments) for support of R&D activities (FY 1992)



See Table 3-7-2.

Table 3-7-1 Support of R&D activities (FY 1992)

Survey items			Disbursed amount (in one million yen)
Promotion of research at medical institutions (local public and private)			15,022
Promotion of research exchange			6,399
	Breakdown	Joint research with national research institution	1,137
		Research exchange among industrial, academic and governmental circles	4,124
		Presentation of the science and technology information from outside the region	490
		Promotion of private research exchange	837
Invitation of R&D oriented businesses			17,494
Raising and support of R&D oriented businesses			4,745
	Breakdown	Raising of R&D oriented businesses and support for upgrading the technological development of local businesses	3,439
		Consultation and guidance on technologies for local businesses	1,131
		Public invitation type R&D scheme	1,036
Total (a)			43,659
(a)/(b)			7.1%
Expenditure for science and technology (b)			613,976

Note: Because of double counting, the amount of "promotion of research exchange" does not agree with the calculated total of sub-items. Similarly, the amount of "raising and support of R&D oriented businesses" does not agree with the calculated total of sub-items.

Table 3-7-2 Expenditure spent by prefectural governments and ordinance-designated city governments for support of R&D activities (FY 1992)

(In 1000 yen)

Prefecture	Promotion of research at medical institutions	Promotion of research exchange	Invitation of R&D oriented businesses	Raising and support of businesses	Total
Hokkaido		145,224	157,825	444,647	747,696
Aomori	14,256	70,658	254,292	35,193	374,399
Iwate		150,394	0	111,320	261,714
Miyagi		160,798		69,224	230,022
Akita	1,156,292	78,005		101,656	1,335,953
Yamagata		2,212,480	5,730	32,909	2,251,119
Fukushima		24,971		14,610	39,581
Ibaraki		100,167		34,629	134,796
Tochigi		233,189	10,909	429,928	674,026
Gunma		58,744	136,690	48,021	243,455
Saitama	618,465	124,003	21,178	35,579	799,225
Chiba	236,713	115,471		51,485	403,669
Tokyo	9,155,998	4,681		53,591	9,214,270
Kanagawa	186,399	172,079		292,014	650,492
Niigata	20,000	29,534	334,809	115,621	499,964
Toyama		34,653		208,246	242,899
Ishikawa		38,121	613,000	91,433	742,554
Fukui	16,457	202,188	1,258,467	62,437	1,539,549
Yamanashi	2,099	15,015		53,792	70,906
Nagano		79,030	0	83,393	162,423
Gifu		12,914		92,036	104,950
Shizuoka	50,663	8,068	461,473	52,973	573,177
Aichi	1,408,524	216,313		71,997	1,696,834
Mie		179,296	2,314,375	50,735	2,544,406
Shiga		58,133	0	35,426	93,559
Kyoto		63,415	58,750	154,441	276,606
Osaka	1,627,004	324,472	7,011,000	75,625	9,038,101
Hyogo	15,988	108,264	7,500	68,804	200,556
Nara		43,570		46,941	90,511
Wakayama	243,397	116,992	0	33,450	393,839
Tottori		4,737	60,659	5,426	70,822
Shimane		11,508	76,651	15,732	103,891
Okayama		54,906	5,930	29,821	90,657
Hiroshima	28,211	174,378	69,959	85,576	358,124
Yamaguchi		267,986	95,103	420,480	783,569
Tokushima		10,296		31,372	41,668
Kagawa		58,768	154,613	72,363	285,744
Ehime	49,706	77,081		38,424	165,211
Kochi	44,917	128,897	0	18,974	192,788
Fukuoka		127,190		84,509	211,699
Saga		93,209	0	180,987	274,196
Nagasaki		54,094	450,000	135,150	639,244
Kumamoto		16,131	3,417,599	167,471	3,601,201
Oita		31,069	91,715	60,640	183,424
Miyazaki	725	29,636	57,900	32,509	120,770
Kagoshima		6,945	42,330	35,543	84,818
Okinawa		6,466	4,430	16,129	27,025
Sub-total	14,875,814	6,334,139	17,172,887	4,483,262	42,866,102
Sapporo		0	72,331	0	72,331
Sendai		13,000	39,590	0	52,590
Chiba		0		0	0
Yokohama		25,038	121,637	118,265	264,940
Kawasaki	20,000	0	11,874	0	31,874
Nagoya		1,518		7,582	9,100
Kyoto		4,120		33,393	37,513
Osaka	89,435	8,131	51,386	59,584	208,536
Kobe	36,550	2,064	12,975	10,842	62,431
Hiroshima		4,221		9,436	13,657
Kitakyushu		3,321		18,100	21,421
Fukuoka		3,000	10,911	4,775	18,686
Sub-total	145,985	64,413	320,704	261,977	793,079
Total of prefectures and cities	15,021,799	6,398,552	17,493,591	4,745,239	43,659,181

Table 3-7-3 Breakdown of the expenditure spent by prefectural governments and ordinance-designated city governments for promotion of research exchange (FY 1992)

(In 1000 yen)

Prefecture	Disbursed amount	Breakdown (because of double counting, each disbursed amount does not always agree with the total of broken down items)			
		Joint research with national research institution	Research exchange among industrial, academic and governmental circles	Presentation of the science and technology information from outside the region	Promotion of private research exchange
Hokkaido	145,224	36,410	24,598	90,649	16,317
Aomori	70,658	22,431	43,546	1,526	3,155
Iwate	150,394	1,000	79,515	7,014	69,879
Miyagi	160,798	33,512	125,014	760	1,512
Akita	78,005	28,420	7,183	1,902	40,500
Yamagata	2,212,480	79,099	2,065,067		68,314
Fukushima	24,971	1,000		1,380	22,591
Ibaraki	100,167		36,000	3,192	60,975
Tochigi	233,189	425	224,400	3,548	4,816
Gunma	58,744	57,220			1,524
Saitama	124,003	46,920	64,432		12,651
Chiba	115,471	10,824	104,278		3,436
Tokyo	4,681		4,681		
Kanagawa	172,079		167,719	1,860	2,500
Niigata	29,534	400	25,453	2,613	1,068
Toyama	34,653	34,653	34,653		
Ishikawa	38,121	14,700	4,996	13,425	5,000
Fukui	202,188	5,526	144,281	41,859	10,522
Yamanashi	15,015	4,650	10,915	0	0
Nagano	79,030		0	63,451	15,579
Gifu	12,914		9,387	795	2,732
Shizuoka	8,068		0	0	8,068
Aichi	216,313	175,000	36,596	280	4,437
Mie	179,296	55,468		98,296	25,532
Shiga	58,133	0	55,961	0	2,172
Kyoto	63,415	7,062	44,975		12,878
Osaka	324,472	19,816	99,246	14,692	190,718
Hyogo	108,264	36,730	63,950		7,584
Nara	43,570	500	39,120	87	3,863
Wakayama	116,992	2,910	111,820	1,762	2,000
Tottori	4,737		1,000	1,660	2,077
Shimane	11,508	200	0	9,808	1,500
Okayama	54,906	49,233	3,053	699	1,921
Hiroshima	174,378	75,000	116,208	10,347	47,823
Yamaguchi	267,986	78,032	184,008	0	5,946
Tokushima	10,296	7,250			3,046
Kagawa	58,768	38,020	55,080	766	1,522
Ehime	77,081	6,309	9,138	58,634	3,000
Kochi	128,897	106,142	21,225		1,530
Fukuoka	127,190	42,331	3,455	23,498	61,361
Saga	93,209	572	57,706	17,162	17,769
Nagasaki	54,094	10,000	12,000	2,500	29,594
Kumamoto	16,131	11,661	3,970	0	2,500
Oita	31,069		3,000	2,018	26,051
Miyazaki	29,636	21,678	2,036	1,781	4,141
Kagoshima	6,945	258	2,731	1,956	2,000
Okinawa	6,466	4,849			1,617
Sub-total	6,334,139	1,126,211	4,102,396	479,920	813,721
Sapporo	0				
Sendai	13,000		13,000		0
Chiba	0				
Yokohama	25,038		6,141	9,726	9,171
Kawasaki	0				
Nagoya	1,518				1,518
Kyoto	4,120	4,120		0	
Osaka	8,131	4,613			3,518
Kobe	2,064		1,500		2,064
Hiroshima	4,221		1,367		2,854
Kitakyushu	3,321	2,349	0		972
Fukuoka	3,000				3,000
Sub-total	64,413	11,082	22,008	9,726	23,097
Total of prefectures and cities	6,398,552	1,137,293	4,124,404	489,646	836,818

Table 3-7-4 Breakdown of the expenditure spent by prefectural governments and ordinance-designated city governments for raising and support of R&D oriented businesses (FY 1992)

(In 1000 yen)

Prefecture	Disbursed amount	Breakdown (because of double counting, each disbursed amount does not always agree with the total of broken down items)		
		Support for upgrading technological development of businesses, etc.	Consultation and guidance on technologies for businesses	Public invitation type R&D scheme
Hokkaido	444,647	241,219	174,472	46,791
Aomori	35,193	19,665	15,528	
Iwate	111,320	94,868	16,452	
Miyagi	69,224	43,231	25,993	
Akita	101,656	78,100	23,556	
Yamagata	32,909	20,000	12,909	
Fukushima	14,610		14,610	0
Ibaraki	34,629	20,000	14,629	
Tochigi	429,928	418,289	11,639	165,641
Gunma	48,021	30,598	17,423	
Saitama	35,579	20,689	14,890	20,689
Chiba	51,485	27,936	8,892	14,657
Tokyo	53,591		38,591	15,000
Kanagawa	292,014	236,952	55,062	0
Niigata	115,621	104,086	11,535	
Toyama	208,246	182,401	25,845	
Ishikawa	91,433	80,000	11,433	
Fukui	62,437	41,820	20,617	
Yamanashi	53,792	14,423	29,369	10,000
Nagano	83,393	62,000	21,393	32,000
Gifu	92,036	50,000	42,036	
Shizuoka	52,973	15,000	37,973	15,000
Aichi	71,997	17,997	54,000	
Mie	50,735	44,326	6,409	44,000
Shiga	35,426	17,300	18,126	
Kyoto	154,441	119,905	47,817	66,000
Osaka	75,625	60,957	14,668	
Hyogo	68,804	64,981	3,823	64,981
Nara	46,941	33,000	13,941	
Wakayama	33,450	16,240	10,819	6,391
Tottori	5,426		5,426	
Shimane	15,732	10,000	5,732	
Okayama	29,821	17,198	12,623	
Hiroshima	85,576	63,573	22,003	
Yamaguchi	420,480	391,065	29,415	268,095
Tokushima	31,372	12,000	7,372	12,000
Kagawa	72,363	63,330	9,033	
Ehime	38,424	24,351	14,073	24,351
Kochi	18,974	15,400	3,574	
Fukuoka	84,509	9,087	44,344	31,078
Saga	180,987	170,125	10,862	
Nagasaki	135,150	119,900	15,250	119,900
Kumamoto	167,471	156,329	11,142	
Oita	60,640	16,480	7,680	36,480
Miyazaki	32,509	26,500	6,009	
Kagoshima	35,543	10,000	20,998	4,545
Okinawa	16,129	8,603	7,526	8,603
Sub-total	4,483,262	3,289,924	1,047,512	1,006,202
Sapporo	0			
Sendai	0	0	0	
Chiba	0			
Yokohama	118,265	81,000	25,390	11,875
Kawasaki	0			
Nagoya	7,582		7,582	
Kyoto	33,393	6,272	27,121	
Osaka	59,584	56,329	3,255	
Kobe	10,842	4,366	6,476	
Hiroshima	9,436	721	8,715	
Kitakyushu	18,100			18,100
Fukuoka	4,775		4,775	
Sub-total	261,977	148,688	83,314	29,975
Total of prefectures and cities	4,745,239	3,438,612	1,130,826	1,036,177

3-8 Fostering Competence of R&D Staff

This section describes the results of investigation on "fostering competence of R&D staff in special technological areas" and "training young researchers" with the activities for private businesses, etc. distinguished from those for prefectural personnel.

In the activities for private businesses, etc., "training young researchers" was only 116 million yen, compared to about 16,400 million yen of "fostering competence of R&D staff in special technological areas". The total amount is about 16,500 million yen.

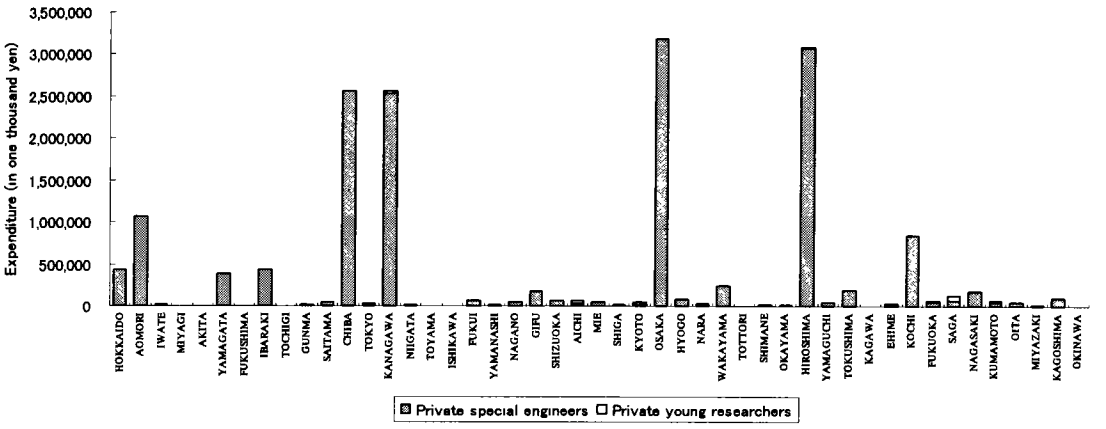
In the activities for prefectural personnel, "fostering competence of R&D staff in special technological areas" was 294 million yen, and "training young researchers", 161 million yen, hence total, 454 million yen.

The total amount of expenditure for both the activities for private businesses, etc. and those for prefectural personnel was about 16,800 million yen, accounting for 2.7% of the total amount of expenditure for science and technology.

The amounts of expenditure spent by respective prefectural governments (including ordinance-designated city governments) for the respective items were as described below (Figs. 3-8-1 and 3-8-2).

According to the answers on the expenditure for the activities for private businesses, etc., about 3,200 million yen of Osaka Prefecture largest in the disbursed amount among all the prefectures was mainly for lifelong ability development benefits and the running expenditure of the vocational engineering college. About 3,100 million yen of Hiroshima Prefecture second largest was mainly for vocational training. These amounts were followed by about 2,600 million yen of Chiba Prefecture (vocational training school management expenditure, vocational training school facilities improving activities, etc.), about 2,500 million yen of Kanagawa Prefecture (vocational ability development activities, etc.) and about 1,100 million yen of Aomori Prefecture (Prefectural Vocational Ability Developing School, Employment Promotion Corporation School, etc.). These five prefectures alone exceeded 1,000 million yen. It can be seen that the amounts are different between the prefectures engaged in the activities for vocational training and those not engaged.

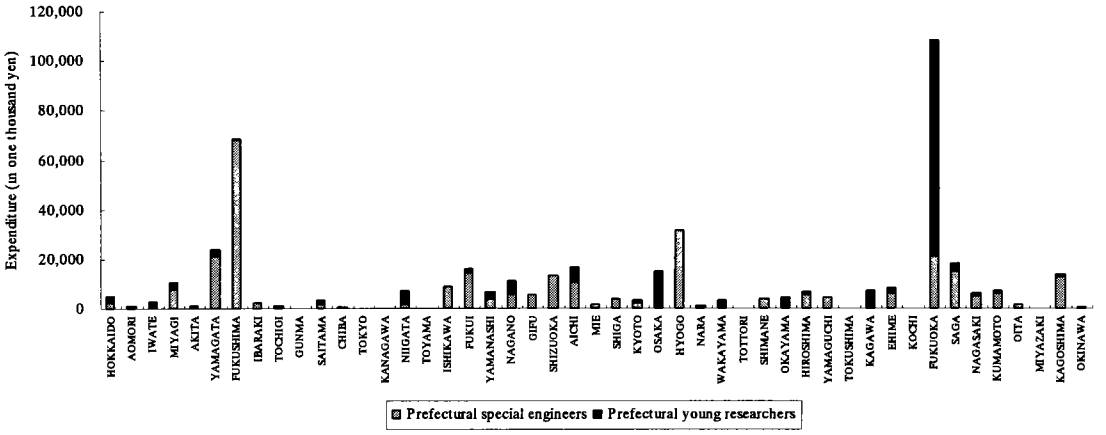
Fig. 3-8-1 Expenditure spent by prefectural governments (ordinance-designated city governments) for raising competent R&D staff of private businesses, etc. (FY 1992)



See Table 3-8-1.

In the expenditure for the activities for prefectural personnel, 109 million yen of Fukushima Prefecture which promoted a special project for new technology R&D mainly for young researchers was largest. The second largest was 68 million yen of Fukushima Prefecture which carried out special training for Civil Engineering Department, training of senior high school teachers on leading technologies, etc.

Fig. 3-8-2 Expenditure spent by prefectural governments (including ordinance-designated city governments) for fostering competence of prefectural R&D staff (FY 1992)



See Table 3-8-1.

Table 3-8-1 Expenditure spent by prefectural governments and ordinance-designated city governments for fostering competence of R&D staff

Prefecture	Disbursed amount	Breakdown (because of double counting, each disbursed amount does not always agree with the calculated total of broken down items)			
		Private special engineers	Private young researchers	Prefectural special engineers	Prefectural young researchers
Hokkaido	442,204	437,451		2,293	2,460
Aomori	1,061,784	1,060,593		598	593
Iwate	22,277	19,753		1,374	1,150
Miyagi	16,037	5,604		7,943	2,490
Akita	2,988	1,839	0		1,149
Yamagata	411,438	387,903		21,285	2,250
Fukushima	73,258	4,870		67,955	433
Ibaraki	435,543	433,297	0	2,246	
Tochigi	4,224	2,983	0	1,241	
Gunma	19,273	19,273			
Saitama	52,577	43,831	5,300	1,778	1,668
Chiba	2,560,500	2,560,073	240	427	247
Tokyo	33,846	33,846			
Kanagawa	2,527,604	2,527,604			
Niigata	29,298	22,328		1,449	5,521
Toyama	0				
Ishikawa	9,100			9,100	
Fukui	84,700	68,629		14,489	1,582
Yamanashi	19,166	12,723		4,049	2,394
Nagano	52,694	47,280		5,414	5,414
Gifu	179,172	173,857		5,315	
Shizuoka	75,442	61,945		13,497	
Aichi	51,207	34,892		10,670	5,645
Mie	46,785	45,037		1,748	
Shiga	22,885	19,031		3,854	
Kyoto	26,733	16,783	7,690	2,260	1,000
Osaka	3,184,364	3,184,364			
Hyogo	76,340	76,340			
Nara	37,426	36,563		863	
Wakayama	234,183	231,395	570	1,218	2,218
Tottori	454	454			
Shimane	19,346	15,427		3,919	
Okayama	19,739	15,277			4,462
Hiroshima	3,080,671	3,076,430		4,241	
Yamaguchi	49,471	45,233		4,238	239
Tokushima	189,695	189,695			
Kagawa	7,302	298			7,004
Ehime	42,022	15,042	18,759	6,192	2,029
Kochi	842,454	842,454			
Fukuoka	161,298	52,768	9,087	21,077	87,453
Saga	77,865	63,124	59,962	14,741	3,697
Nagasaki	174,021	167,688		4,946	1,387
Kumamoto	60,376	54,269	11,880	6,107	908
Oita	44,788	42,992		1,796	
Miyazaki	9,668	9,668			
Kagoshima	116,960	103,335		12,573	1,052
Okinawa	550			550	
Sub-total	16,689,728	16,264,241	113,488	261,446	144,445
Sapporo	0				
Sendai	0	0			
Chiba	0				
Yokohama	25,390	25,390			
Kawasaki	704	704			
Nagoya	25,337	25,337			
Kyoto	22,571	22,571			
Osaka	15,909	1,009			14,900
Kobe	38,196	6,909		31,287	
Hiroshima	3,571	2,368	2,368	1,203	1,203
Kitakyushu	0				
Fukuoka	9,105	9,105			
Sub-total	140,783	93,393	2,368	32,490	16,103
Total of prefectures and cities	16,830,511	16,357,634	115,856	293,936	160,548

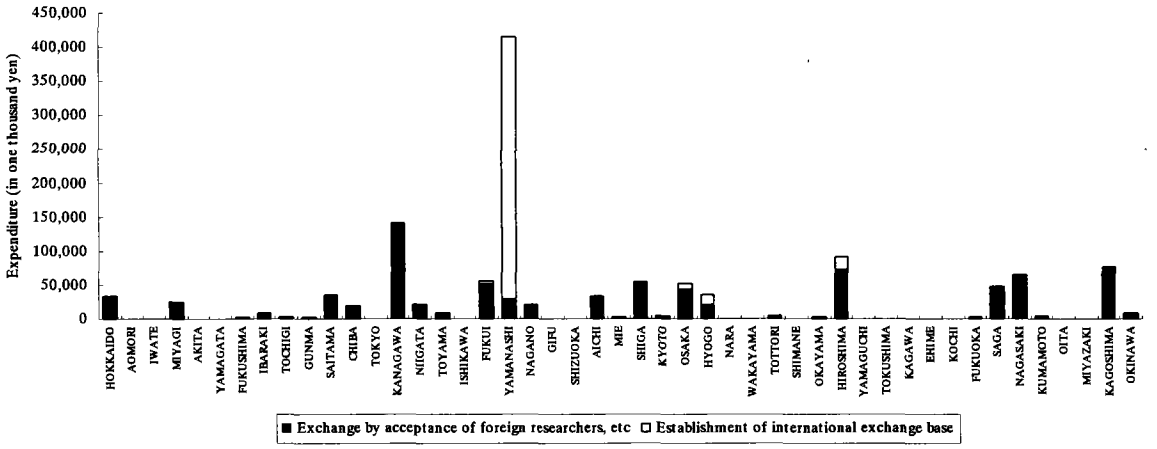
3-9 Promotion of International Exchange

This section describes the measures taken by local authorities for "establishment of international exchange base" in the science and technology areas covered by local authorities and for "promotion of international exchange" in the science and technology areas such as the acceptance of foreign researchers, dispatch of researchers to overseas nations, invitation for holding international meetings and international joint research.

"Establishment of international exchange base" was about 400 million yen (Table 3-9-1), showing a large decrease compared to about 14,600 million yen found in the previous survey (results of FY 1990). "Promotion of international exchange" was about 900 million yen. The total was about 1,300 million yen.

In the expenditure spent by respective prefectural governments (including ordinance-designated city governments), the largest disbursed amount was 414 million yen of Yamanashi Prefecture which was mainly spent for Yamanashi Forestry and Forest Products Research Institute construction project. It was followed by 142 million yen of Kanagawa Prefecture (acceptance of overseas engineering trainees, etc.), 123 million yen of Hiroshima Prefecture (International Cooperation Promotion Project for Treatment of Radiation Exposure Victims, etc.), 76 million yen of Kagoshima Prefecture (International Space Year Commemorative Event Holding Project, etc.), and 65 million yen of Nagasaki Prefecture (international joint research concerning functional gradient thin film forming technology, etc.).

Fig. 3-9-1 Expenditure spent by prefectural governments (ordinance-designated city governments) for international exchange in science and technology areas (FY 1992)
(Establishment of international exchange base and promotion of international exchange are partially doubly counted.)



See Table 3-9-2.

Table 3-9-1 Activities of prefectural governments and ordinance-designated city governments for establishment of international exchange base (FY 1992)

Prefecture	Title of activities	Competent administrative section	Disbursed amount of FY 1992 (in 1000 yen)	Outline of activities
Fukui	Formulation of basic concept of Energy Research Center (provisional name)	General Affairs Dept.	5,000	Energy Research Center (provisional name) as a center of atompolis plan
Yamanashi	Forestry and Forest Products Research Institute (provisional name) Construction Project	Forestry Dept.	384,120	Present Forestry Research Center will be changed in name and improved for newly constructing a research institute at a different place under a different name. The new research institute will be opened in FY 1994. The land preparation work: Temporary work, earth work, garden path and space work, drainage work Construction work: Management Building, laboratory building, class room of forest, part of machine room (256,311,000 yen will be carried over to the next year)
Osaka	Promotion of Japan-US technology exchange	Commerce and Industry Dept.	14,090	OCL Technology Center, Co. Ltd. was established in cooperation with the industry at San Jose, California, USA (September, 1988), to promote the collection, presentation and exchange of technology information between Japan and the US.
Osaka city	Leading technology international exchange activities for Osaka City small and medium-sized businesses	Economy Bureau	7,400	1. International exchange of manufacturing industry technologies through Manufacturing Industry Research Institute 2. Dispatch of missions for overseas technology exchange
Hiroshima	Hiroshima International Cooperation Center (provisional name) Establishment Project	General Affairs Dept.	20,352	Foreign students studying in Japan and researchers in Japan from developing nations mainly in Asia will be raised as competent R&D staff who will contribute to the development of respective nations and to the activities of businesses of those countries in other foreign countries, and an exchange base connecting Hiroshima with the world necessary for cultivation of internationality and for raising a new type of competent R&D staff open to the prefectural citizens will be created step by step.
Kumamoto	International Health and Medical Service Exchange Center		(130,000)	(Foundation running expenditure) 1) Educate and train health and medical service experts of developing nations and 2) participate in health and medical service cooperation projects, for promoting the international cooperation in the health and medical service area.
	Total		430,962	

Note: Since prefectural governments do not directly disburse for the activities of foundations, the amounts are not counted in totalizing disbursed amounts.

Table 3-9-2 Expenditure spent by prefectural governments and ordinance-designated city governments for international exchange (FY 1992)

(In 1000 yen)

Prefecture	Disbursed amount	Breakdown (because of double counting, each disbursed amount does not always agree with the calculated total of broken down items.)	
		Establishment of international exchange base	Exchange by acceptance of foreign researchers, etc.
Hokkaido	33,974		33,974
Aomori	0		
Iwate	0		0
Miyagi	24,597		24,597
Akita	0		0
Yamagata	0		
Fukushima	2,300		2,300
Ibaraki	7,673		7,673
Tochigi	3,080		3,080
Gunma	1,360		1,360
Saitama	34,929		34,929
Chiba	17,650		17,650
Tokyo	0		
Kanagawa	108,154		108,154
Niigata	20,249		20,249
Toyama	7,645		7,645
Ishikawa	0		
Fukui	56,409	5,000	51,409
Yamanashi	413,710	384,120	29,590
Nagano	20,031		20,031
Gifu	0		
Shizuoka	0		0
Aichi	32,199		32,199
Mie	1,487		1,487
Shiga	53,537		53,537
Kyoto	3,585		3,585
Osaka	25,090		25,090
Hyogo	16,768	14,090	16,768
Nara	0		
Wakayama	0		
Tottori	3,648		3,648
Shimane	0		0
Okayama	1,221		1,221
Hiroshima	91,920	20,352	71,568
Yamaguchi	0		0
Tokushima	0		
Kagawa	0		
Ehime	0		
Kochi	0		
Fukuoka	2,511		2,511
Saga	48,069		48,069
Nagasaki	64,800		64,800
Kumamoto	3,123	0	3,123
Oita	0		
Miyazaki	0		
Kagoshima	76,088		76,088
Okinawa	8,849		8,849
Sub-total	1,184,656	423,562	775,184
Sapporo	0		
Sendai	0		
Chiba	0		
Yokohama	33,450		33,450
Kawasaki	0		
Nagoya	0		
Kyoto	0		
Osaka	18,864	7,400	18,864
Kobe	3,372		3,372
Hiroshima	30,959		30,959
Kitakyushu	0		
Fukuoka	0		
Sub-total	86,645	7,400	86,645
Total of prefectures and cities	1,271,301	430,962	861,829

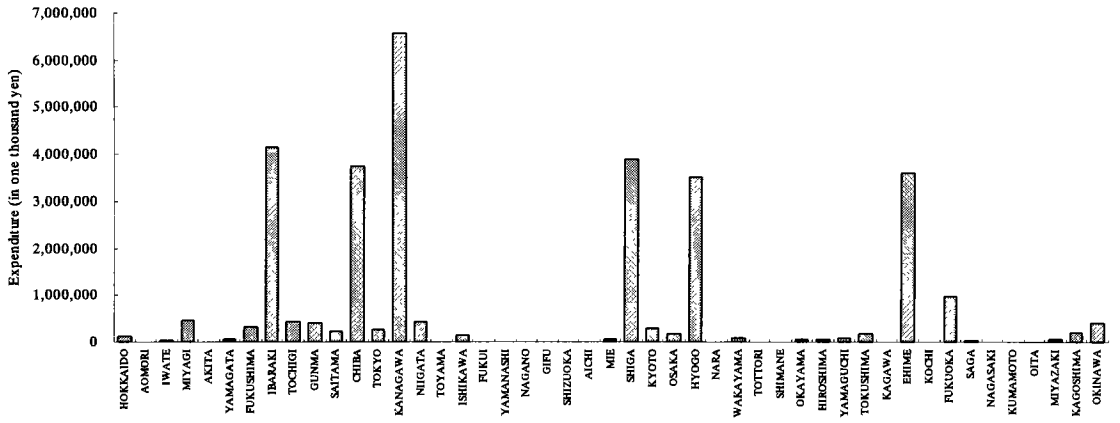
3-10 Promotion of public understanding of science and technology

This section describes the measures taken by local authorities for the promotion of public understanding of science and technology such as "local public natural science museum", "science and technology education in areas of youth education, lifelong education, etc." and "deepening citizens' understanding on science and technology".

The expenditure for "local public natural science museum" was about 28,800 million yen, that of "science and technology education", about 1,800 million yen, and that of "deepening citizens' understanding on science and technology", about 900 million yen, hence total, about 31,000 million yen (Table 3-10-1). This amount corresponds to 5% of the total amount of expenditure for science and technology.

Among the respective prefectures (including ordinance-designated cities), six prefectures engaged in the establishment of any local public natural science museum of Ibaraki (Nature Museum), Chiba (Modern Industry and Science Museum), Kanagawa (Planet of Life - Earth Museum), Shiga (Biwa Lake Museum), Hyogo (Museum of Human Beings and Nature) and Ehime (General Science Museum) disbursed about 3,000 million yen to less than 6,000 million yen respectively (Fig. 3-10-1) spent about 3,000 million yen to less than 6,000 million yen respectively. Local public museums were established or are planned to be established by 27 prefectural governments, and 10 ordinance-designated city governments excluding Sapporo and Fukuoka, to show that local public museums are being more actively established in ordinance-designated cities (Table 3-10-1).

Fig. 3-10-1 Expenditure spent by prefectural governments (including ordinance-designated city governments) for promotion of public understanding of science and technology (FY 1992)



See Table 3-10-1.

Table 3-10-1 Promotion activities of public understanding of science and technology by prefectural governments and ordinance-designated city governments (FY 1992)

(In 1000 yen)

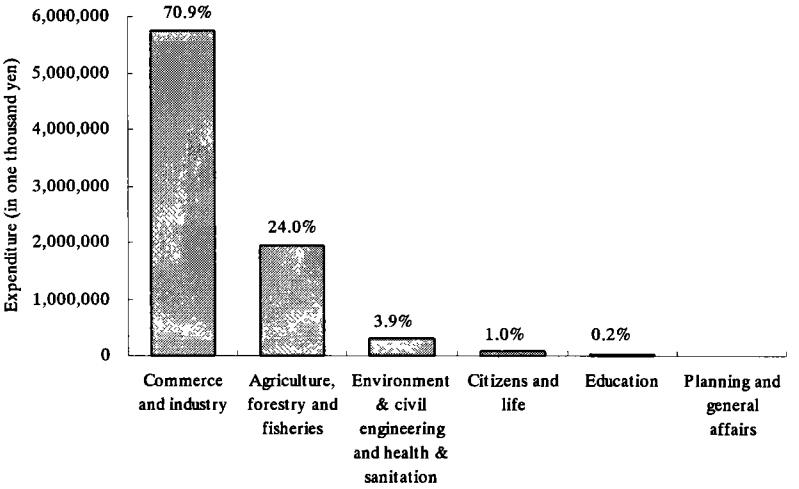
Prefecture	Disbursed amount	Breakdown (each disbursed amount does not always agree with the calculated total of broken down items.)			Establishment as part of general museum		Establishment as independent natural science museum	
		Prefectural natural science museum	Science and technology education	Promotion of public understanding of science and technology	Completed	Being planned	Completed	Being planned
Hokkaido	112,986		58,836	54,150				
Aomori	9,200		9,200					
Iwate	36,485	36,485	0	0			1	
Miyagi	17,767		4,167	13,600				
Akita	1,636		1,636					
Yamagata	68,002	66,690	1,192	120	1		1	
Fukushima	324,322	314,314	9,808	200	1			
Ibaraki	4,157,301	4,157,301						1
Tochigi	421,604	421,604	0	0	1			
Gunma	408,941	292,902	116,039					1
Saitama	222,124	217,637	2,145	3,021			1	
Chiba	3,755,717	3,678,909	16,708	60,100	1			1
Tokyo	255,702	32,316	223,386				1	
Kanagawa	5,898,584	5,756,796	113,588	28,200				1
Niigata	442,801	442,249	552				1	
Toyama	7,928	4,939	2,989	0		1		
Ishikawa	145,392	145,392					1	1
Fukui	849		270	579				
Yamanashi	5,906		5,584	322				
Nagano	0		0	0				
Gifu	0							
Shizuoka	2,399			2,399				
Aichi	0							
Mie	53,190	23,155	28,816	1,219	1	1		
Shiga	3,887,332	3,887,332				1		
Kyoto	7,230		7,230	0				
Osaka	53,474		43,582	9,892				
Hyogo	3,055,523	2,933,194	122,329				1	
Nara	0							
Wakayama	78,107	78,074		33			1	
Tottori	9,426	9,318	48	60	1			
Shimane	0	0						
Okayama	55,844	44,254	11,590	3,090			1	
Hiroshima	5,913		4,241	1,672				
Yamaguchi	90,725	90,725		0	1			
Tokushima	181,788	175,288	6,500		1			
Kagawa	1,848		1,848					
Ehime	3,589,115	3,553,873	30,444	4,798				1
Kochi	12,966			12,966				
Fukuoka	499,305	446,749	448,584	50,721			1	
Saga	14,429	12,540		1,889				1
Nagasaki	7,800		7,800					
Kumamoto	1,623			1,623				
Oita	410		410		1			
Miyazaki	60,488	52,226	1,578	6,684				
Kagoshima	189,962	96,827	92,270	7,696			1	
Okinawa	392,944	392,944	0		1			
Sub-total	28,545,088	27,364,033	1,373,370	265,034	10	3	11	7
Sapporo	0							
Sendai	432,873	432,757	116				1	
Chiba	658	658						1
Yokohama	615,784	0	6,460	609,324				1
Kawasaki	45,514	43,843	1,671				1	
Nagoya	0	0					1	
Kyoto	268,767	187,762	81,005				1	
Osaka	130,000	130,000	0				1	
Kobe	466,916	466,740	176				1	
Hiroshima	41,291	41,291					1	
Kitakyushu	468,312	108,422	359,890			1	1	
Fukuoka	93		93					
Sub-total	2,470,208	1,411,473	449,411	609,324	0	1	8	2
Total of prefectures and cities	31,015,296	28,775,506	1,822,781	874,358	10	4	19	9

3-11 Preferentially pursued R&D subjects

This section describes the "R&D subjects and technology subjects especially preferentially pursued" by local governments. The expenditure was about 8,100 million yen, and the number of subjects was 167.

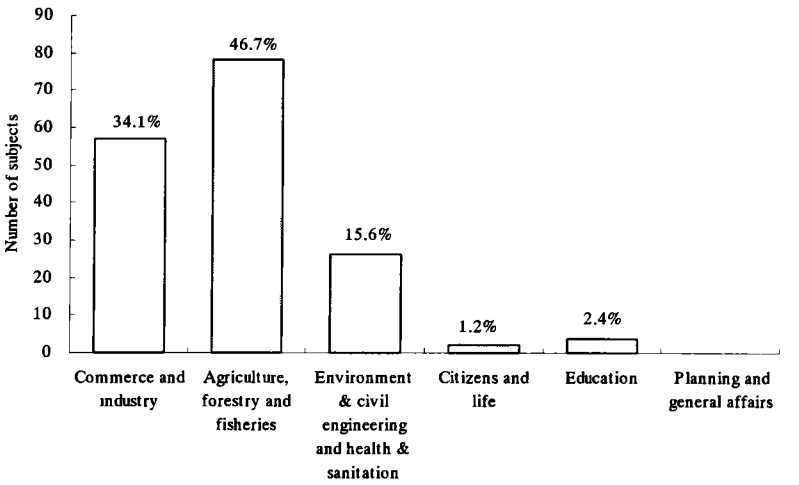
According to the answers in reference to respective service categories, the expenditure of the commerce and industry category accounted for 71%, being followed by 24% of the agriculture, forestry and fisheries category, and the number of subjects in the agriculture, forestry and fisheries category accounted for 47%, being followed by 34% in the commerce and industry category and 16% in the environment & civil engineering and health & sanitation category (Figs. 3-11-1 and 3-11-2).

Fig. 3-11-1 Expenditure spent by prefectural governments (including ordinance-designated city governments) for preferentially pursued subjects by service category (FY 1992)



See Table 3-11-1.

Fig. 3-11-2 Numbers of preferentially pursued subjects of prefectural governments (including ordinance-designated city governments)



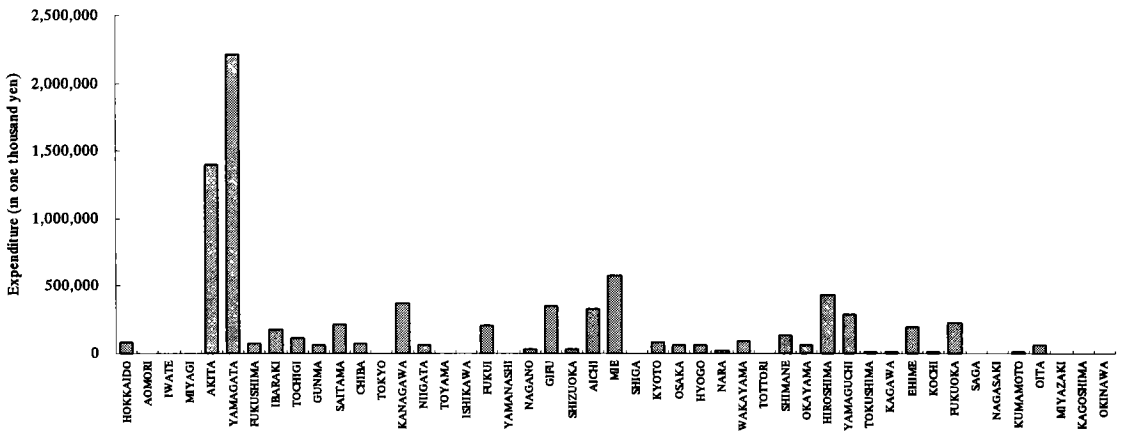
See Table 3-11-1.

Table 3-11-1 Preferentially pursued subjects of prefectural governments (including ordinance-designated city governments) (FY 1992)

Service category	Disbursed amount (in 1000 yen)	Percentage	Number of subjects	Percentage
Commerce and industry	5,740,641	70.9%	57	34.1%
Agriculture, forestry and fisheries	1,945,646	24.0%	78	46.7%
Environment & civil engineering and health & sanitation	312,611	3.9%	26	15.6%
Citizens and life	82,026	1.0%	2	1.2%
Education	18,746	0.2%	4	2.4%
Planning and general affairs	0	0.0%	0	0.0%
Total	8,099,670	100.0%	167	100.0%

As for the amounts of expenditure of respective prefectures, about 2,200 million yen was spent by Yamagata Prefecture which promoted life support technology R&D, being followed by about 1,400 million yen of Akita Prefecture which promoted research for practically applying a high density vertical magnetic recording system, about 500 million yen of Mie Prefecture (raising new varieties of special agricultural products, etc.), and about 400 million yen of Hiroshima Prefecture (special research on electronics, research on the measures to be taken against the shortage of competent R&D staff, etc.) in this order (Fig. 3-11-3).

Fig. 3-11-3 Expenditure spent by prefectural governments (including ordinance-designated city governments) for preferentially pursued R&D subjects (FY 1992)



See Table 3-11-2.

Table 3-11-2 Preferentially pursued R&D subjects of prefectural governments and ordinance-designated city governments (FY 1992) (Disbursed amount in 1000 yen)

Prefecture	Disbursed amount	Number of subjects
Hokkaido	79,997	7
Aomori		
Iwate		
Miyagi		
Akita	1,398,266	1
Yamagata	2,208,521	3
Fukushima	67,102	3
Ibaraki	178,626	3
Tochigi	114,248	1
Gunma	57,220	1
Saitama	211,710	15
Chiba	68,970	1
Tokyo		
Kanagawa	337,228	9
Niigata	63,288	1
Toyama		
Ishikawa	2,400	1
Fukui	207,541	6
Yamanashi		
Nagano	28,457	1
Gifu	353,519	4
Shizuoka	28,273	5
Aichi	326,490	11
Mie	572,296	7
Shiga		
Kyoto	64,432	4
Osaka	44,316	2
Hyogo	64,528	4
Nara	20,700	2
Wakayama	89,456	8
Tottori		
Shimane	133,482	4
Okayama	63,960	6
Hiroshima	428,290	13
Yamaguchi	283,573	6
Tokushima	13,111	4
Kagawa	13,750	1
Ehime	200,000	2
Kochi	8,996	1
Fukuoka	199,019	10
Saga		
Nagasaki	4,361	1
Kumamoto	7,993	3
Oita	59,850	1
Miyazaki	3,800	1
Kagoshima		
Okinawa		
Sub-total	8,007,769	153
Sapporo		
Sendai		
Chiba		
Yokohama	30,671	6
Kawasaki		
Nagoya		
Kyoto	22,060	2
Osaka	14,939	2
Kobe	0	
Hiroshima		
Kitakyushu	24,231	4
Fukuoka		
Sub-total	91,901	14
Total of prefectures and cities	8,099,670	167

CHAPTER 4 CONDITIONS OF RESEARCH ACTIVITIES BY REGIONAL RESEARCH INSTITUTES (KOUSETSUSHI: PREFECTURAL/MUNICIPAL INDUSTRIAL RESEARCH INSITUTES)

This chapter describes the conditions of research activities (survey period: FY 1992) based on the results of the questionnairing conducted on the actual conditions of research at Regional Research Institutes (Kousetsushi: Prefectural/Municipal Industrial Research Institutes), in comparison with the results of the previous survey (survey period: FY 1990).

4-1 Summary of Surveyed Institutes

For the present survey, the questionnaire was sent to 670 institutions (628 institutions in the previous survey), and answers were obtained from 450 institutions (472 institutions in the previous survey). The collection rate was 67% (75% in the previous survey).

Of the 450 answering institutions in the present survey, the numbers and percentages of institutions of respective research categories were 86 institutions and 19% belonging to the health and environment category (previously 90 institutions and 19%), 253 institutions and 56% belonging to the agricultural, forestry and fisheries category (previously 287 institutions and 60%), 96 institutions and 21% belonging to the manufacturing industry category (previously 90 institutions and 19%) and 15 institutions and 3% belonging to the other category (previously 12 institutions and 3%). The average numbers of personnel and researchers in these four categories were 38 personnel and 28 researchers in the health and environment category (previously 37 personnel and 30 researchers), 42 personnel and 22 researchers in the agriculture, forestry and fisheries category (previously 41 personnel and 33 researchers), 42 personnel and 32 researchers in the manufacturing industry category (previously 37 personnel and 30 researchers and 34 personnel and 17 researchers in the other category (previously 29 personnel and 23 researchers).

4-2 Survey Results

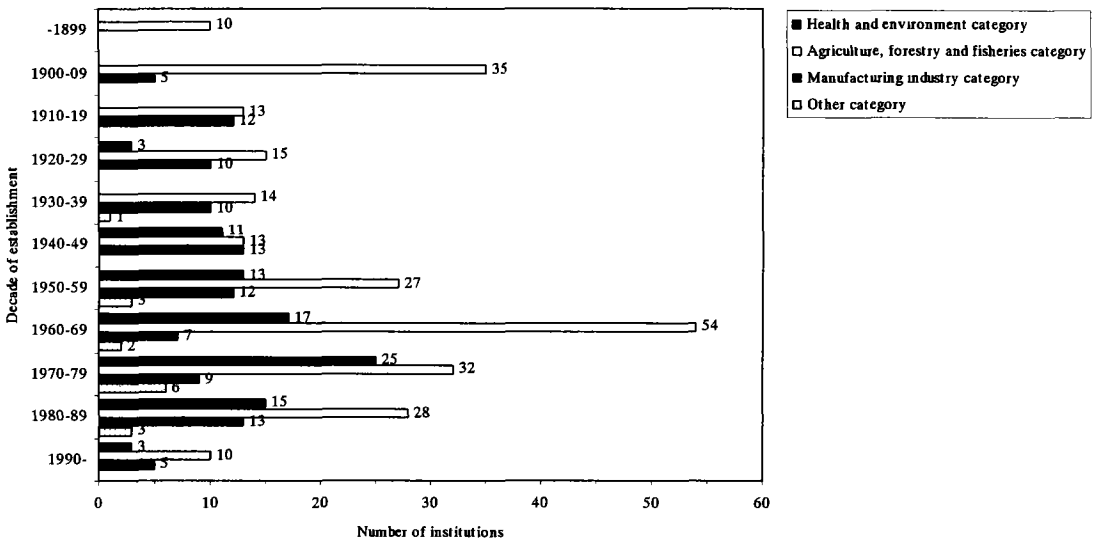
(1) Years of establishment and restructuring

1) Years of establishment

As for the years when regional research institutes were established, regional research institutes of agriculture, forestry and fisheries category were established in the beginning of the 1900s, and subsequently the regional research institutes of manufacturing industry category were established. After the war, the regional research institutes of health category such as sanitation research institutes were established, and from the latter half of the 1960s, regional research institutes of environment category such as environmental pollution research institutes were established since environmental issues caused by high economic growth were revealed, being established especially in the 1970s at a peak pace.

Partially because Fundamentals of Agriculture Law was established in 1961, regional research institutes of agriculture, forestry and fisheries category were established at a peak pace in the 1960s, and also thereafter, more regional research institutes of the same category were established compared to those of the other categories. Those of manufacturing industry category were established at a slow pace in the 1960s to 1970s, but tended to be increasingly established in the 1980s and 1990s (Fig. 4-2-1).

Fig. 4-2-1 Numbers of regional research institutes established in respective decades

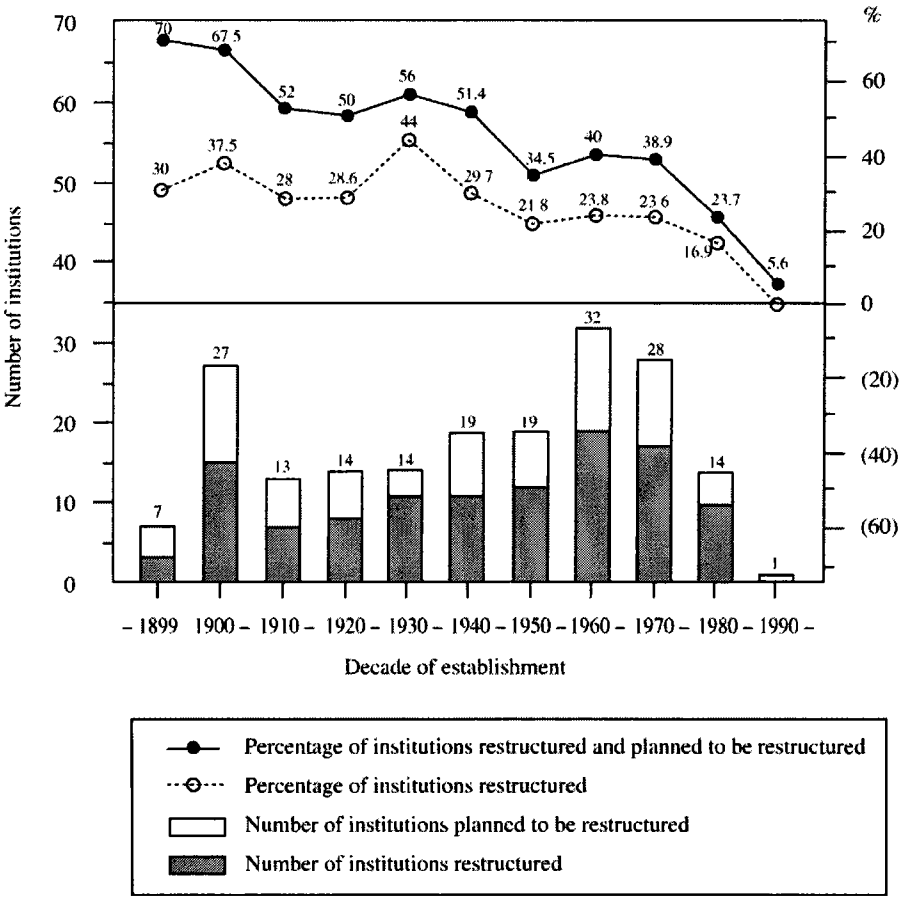


2) Restructuring (all institutions)

The regional research institutes which answered that they carried out drastic restructuring in the period from FY 1984 to FY 1993 accounted for 26%, and those answered they planned to carry out after FY 1994 accounted for 17%.

In reference to decades of establishment, it can be seen that the percentage of institutions restructured and planned to be restructured became lower when the decade of establishment was more recent, though there were some variations (Fig. 4-2-2).

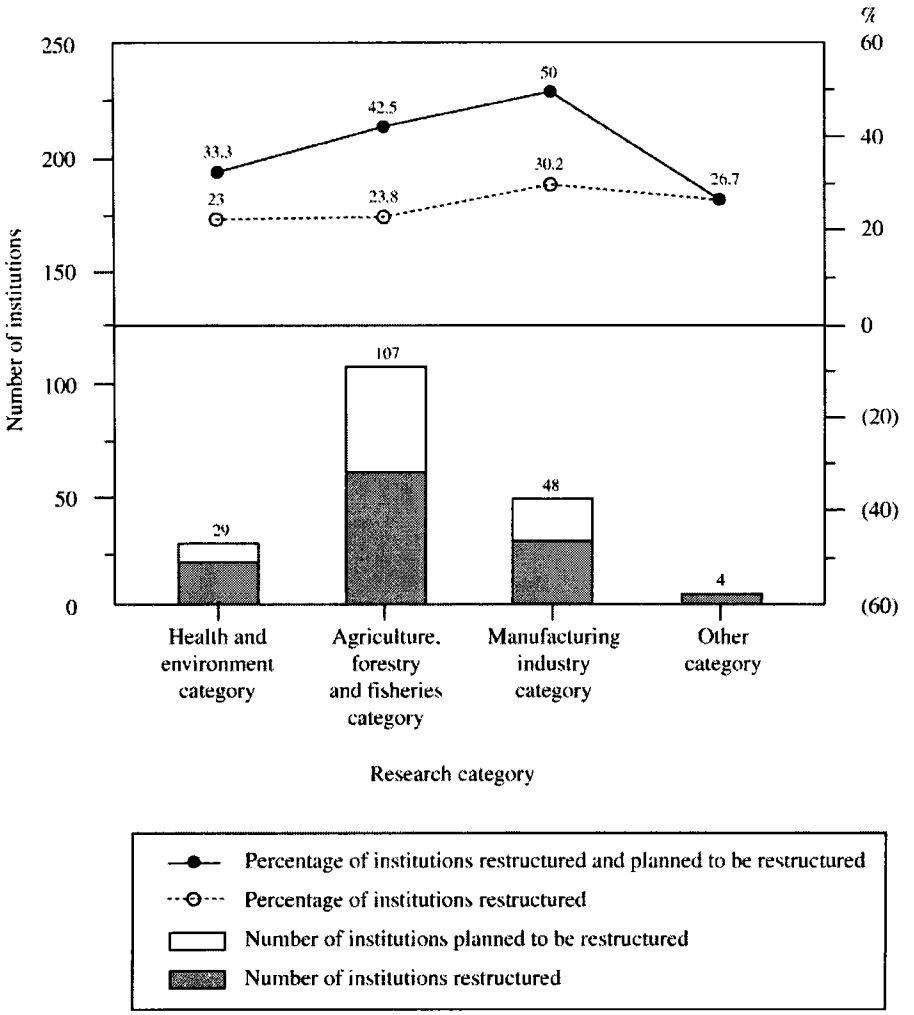
Fig. 4-2-2 Conditions of restructuring of regional research institutes by decade of establishment



3) Restructuring (respective research categories)

If the restructuring cases are seen in reference to respective research categories, the agriculture, forestry and fisheries category largest in the number of regional research institutes was large in both the number of institutions restructured and the number of institutions planned to be restructures. However, in the percentages of institutions restructured and institutions planned to be restructured of respective categories, the manufacturing industry category was 30% in the percentage of institutions restructured and 20% in the percentage of institutions planned to be restructured, being larger than the agriculture, forestry and fisheries category (24% of institutions restructured and 19% of institutions planned to be restructured) and the health and environment category (23% of institutions restructured and 10% of institutions planned to be restructured) (Fig. 4-2-3).

Fig. 4-2-3 Restructuring cases of regional research institutes by research category (upper part: percentage of restructuring cases lower part: number of institutions)



(2) Research areas

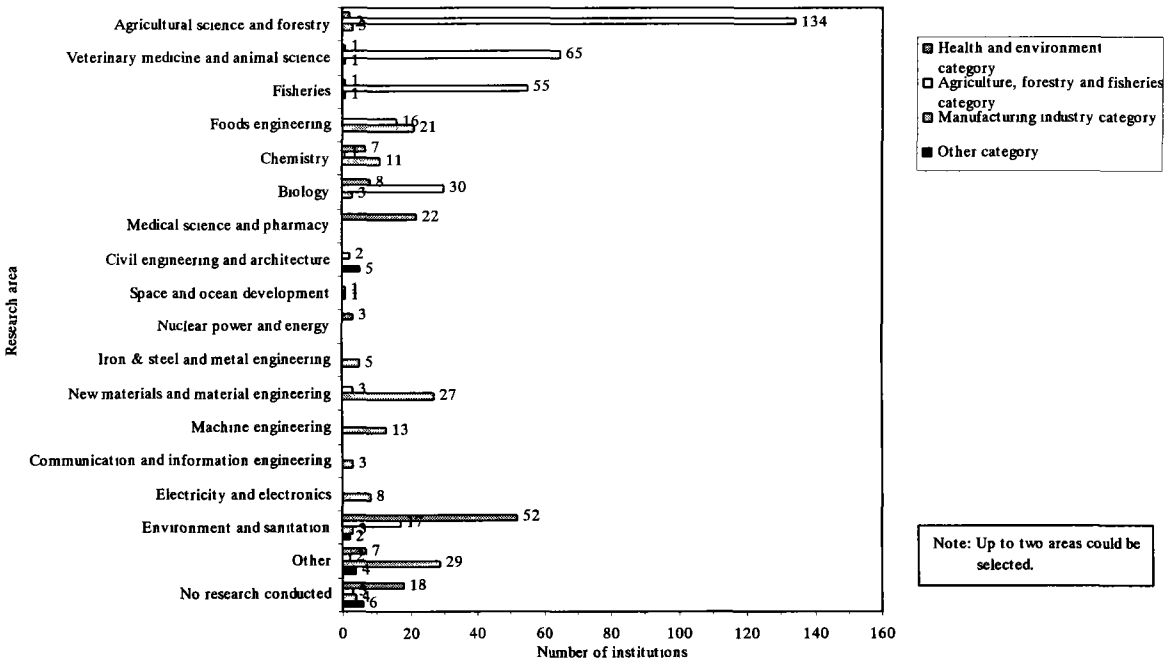
Regional research institutes were requested to state up to two major research areas, and the results were compiled for the respective research categories in Fig. 4-2-4.

Among the regional research institutes of health and environment category, "environment and sanitation" area was largest in the number of institutions, being followed by "medical science and pharmacy", "biology", "chemistry, etc. "No research conducted" is considered to mean that the institution was engaged in testing, inspection, etc., but not in the activities called research.

Among the regional research institutes of agriculture, forestry and fisheries category, the areas of "agricultural science and forestry", "veterinary medicine and animal science" and "fisheries" correspond to the regional research institutes of agriculture, forestry, livestock, fisheries, etc. and are main research areas of such regional research institutes. These areas are followed by "biology", "environment and sanitation", "foods engineering", etc.

Among the regional research institutes of manufacturing industry category, "new materials and material engineering", "foods engineering", "machine engineering", "chemistry", etc. are main areas. In the "other" area, "fibers" and "ceramics" accounted for two thirds.

Fig. 4-2-4 Main research areas of regional research institutes by research category



(3) Staff

1) Personnel structure

The personnel structures of regional research institutes of health and environment category, agriculture, forestry and fisheries category and manufacturing industry category in FY 1992 are shown below. The results of the previous survey (values of FY 1990) are also shown for reference. Percentages are shown with the number of institutions answering to have respectively one or more personnel, researchers and research assistants, as 100 (hereinafter this applies).

A. Regional research institutes of health and environment category

As for the number of personnel, the number of institutions in the "20 to 29 persons" bracket was largest, accounting for 25%, to show a slight increase compared to 24% of FY 1990. The institutions in the brackets of 19 or less persons decreased and the institutions in the "50 to 99 persons" bracket increased (Fig. 4-2-5 (1)).

As for the number of researchers, the number of institutions in the "20 to 29 persons" bracket was largest, accounting for 25%. Compared to FY 1990, the institutions in the brackets of 19 persons or less decreased, and the institutions in the brackets of 20 persons or more increased (Fig. 4-2-5 (2)).

As for the number of research assistants, the institutions in the "1 to 9 persons" bracket accounted for 93%, showing an increased from 87% of FY 1990.

Fig. 4-2-5 (1) Percentages of regional research institutes by personnel number bracket (health and environment category)

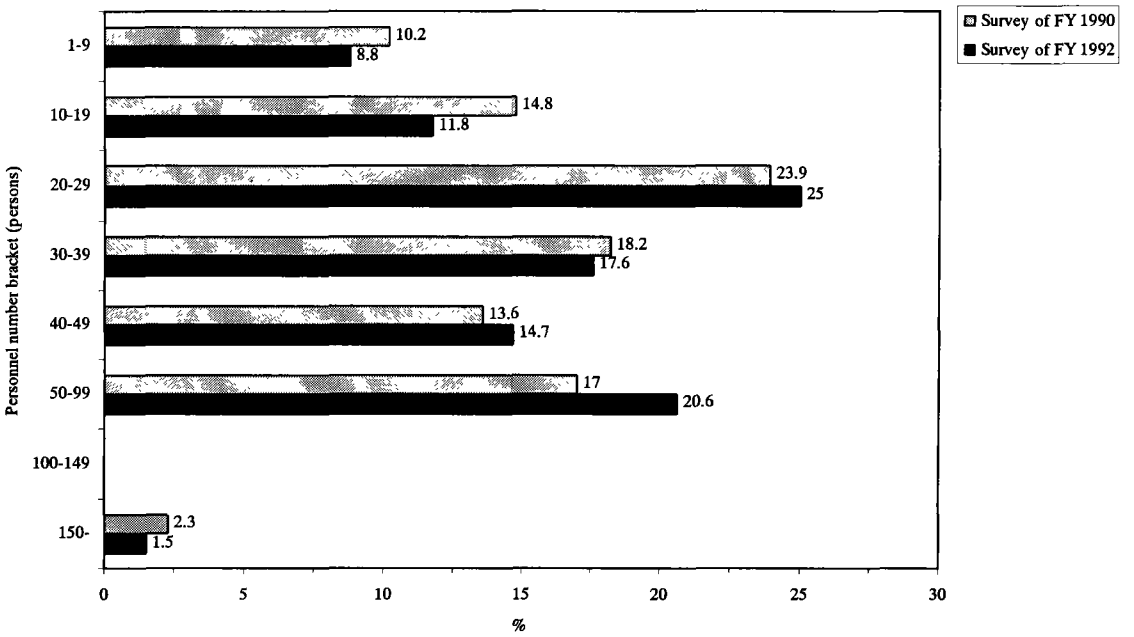


Fig. 4-2-5 (2) Percentages of regional research institutes by researcher number bracket (health and environment category)

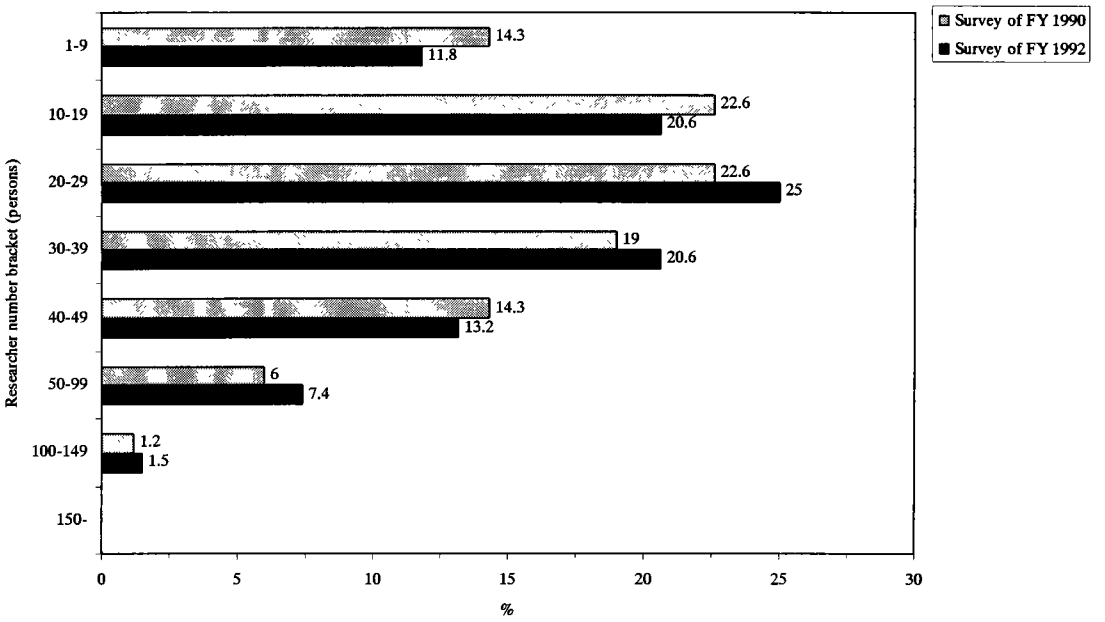
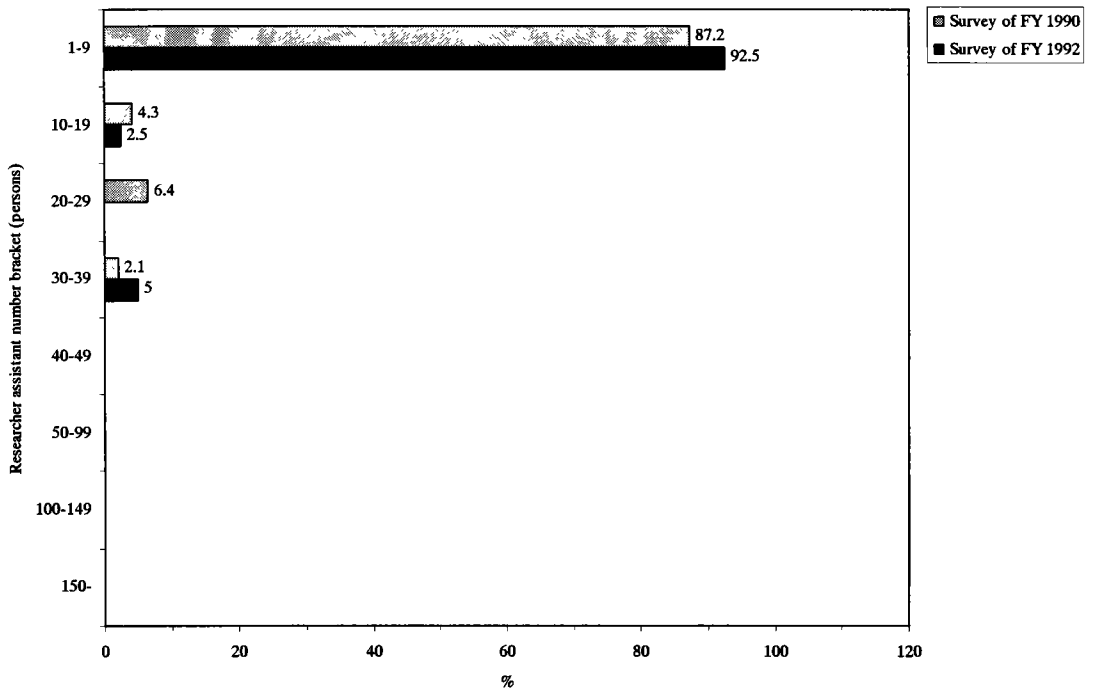


Fig. 4-2-5 (3) Percentages of regional research institutes by research assistant number bracket (health and environment category)



B. Regional research institutes of agriculture, forestry and fisheries category

As for the number of personnel, the institutions in the "10 to 19 persons" bracket accounted for 23%, and those in the "20 to 29 persons" bracket, 21%.

Compared to FY 1990, the institutions in the "20 to 29 persons" and "30 to 39 persons" brackets decreased and those in the "40 to 49 persons" and "100 to 149 persons" brackets increased (Fig. 4-2-6 (1)).

As for the number of researchers, the institutions in the "10 to 19 persons" bracket accounted for 36%, and those in the "1 to 9 persons" bracket, 29%. Compared to FY 1990, the institutions in the "1 to 9 persons" bracket increased, and those in the "10 to 19 persons" bracket decreased (Fig. 4-2-6 (2)). It is estimated that among the regional research institutes of agriculture, forestry and fisheries category, the reduction of researchers progressed more than the scale expansion by restructuring, etc.

As for research assistants, the institutions in the "1 to 9 persons" bracket accounted for 57%, showing a slight decreased from 59% of FY 1990.

Fig. 4-2-6 (1) Percentages of regional research institutes by personnel number bracket (agriculture, forestry and fisheries category)

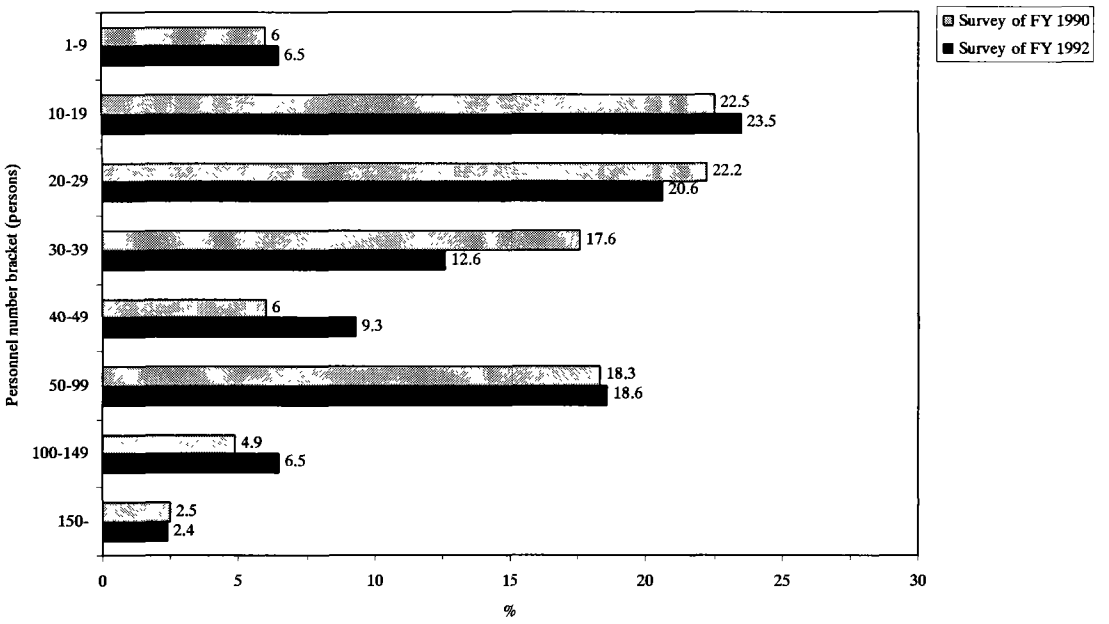


Fig. 4-2-6 (2) Percentages of regional research institutes by researcher number bracket (agriculture, forestry and fisheries category)

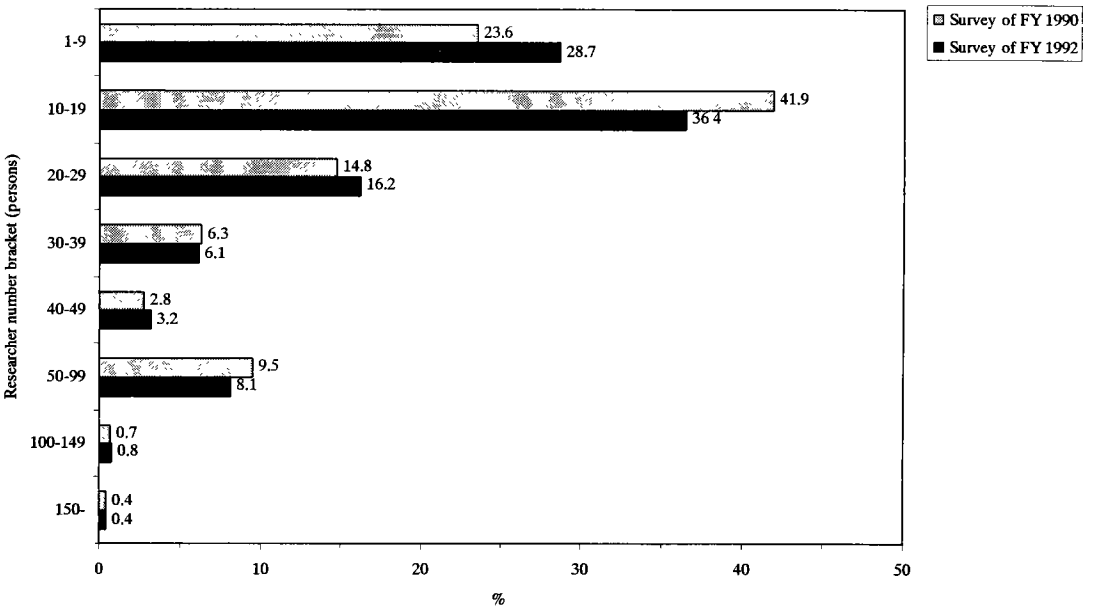
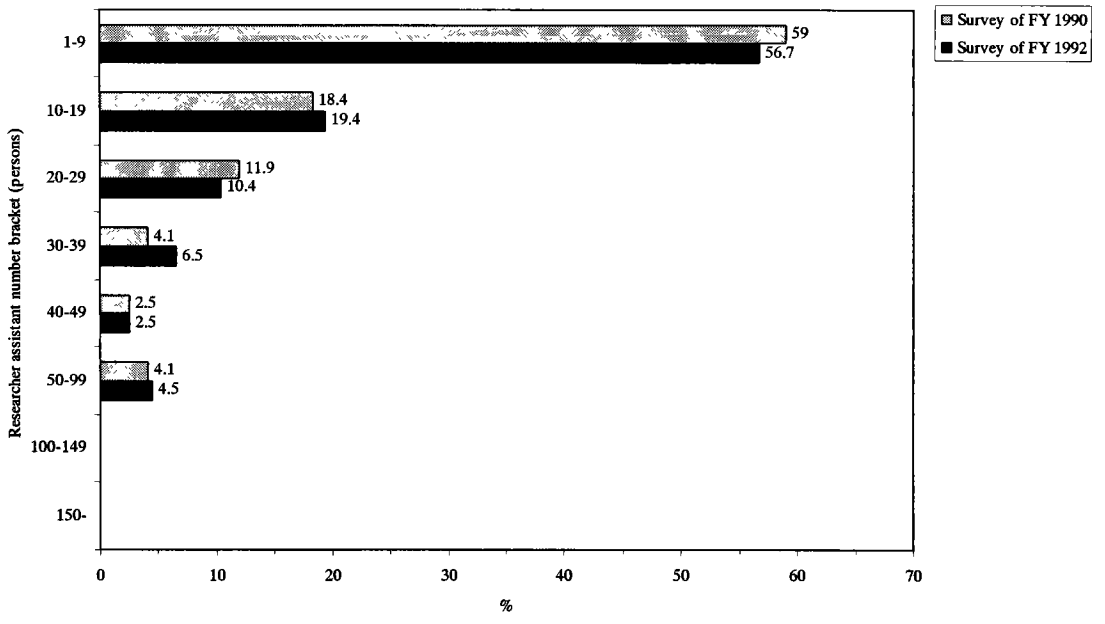


Fig. 4-2-6 (3) Percentages of regional research institutes by researcher assistant number bracket (persons)



C. Regional research institutes of manufacturing industry category

As for the number of personnel, the institutions in the "10 to 19 persons" bracket accounted for 23%, and those in the "20 to 29 persons" bracket, 17%. Compared to FY 1990, the institutions in the brackets of 19 persons or less decreased, and those in the brackets of 20 persons or more increased (Fig. 4-2-7 (1)).

As for the number of researchers, the institutions in the "10 to 19 persons" bracket accounted for 26%, and those in the "1 to 9 persons" bracket, 17%. Compared to FY 1990, the institutions in the "1 to 9 persons" and "30 to 39 persons" brackets decreased, and those in the other brackets increased (Fig. 4-2-7 (2)).

As for research assistants, the institutions in the "1 to 9 persons" bracket accounted for 89%, showing a decrease from 92% of FY 1990 (Fig. 4-2-7 (3)).

Fig. 4-2-7 (1) Percentages of regional research institutes by personnel number bracket (manufacturing industry category)

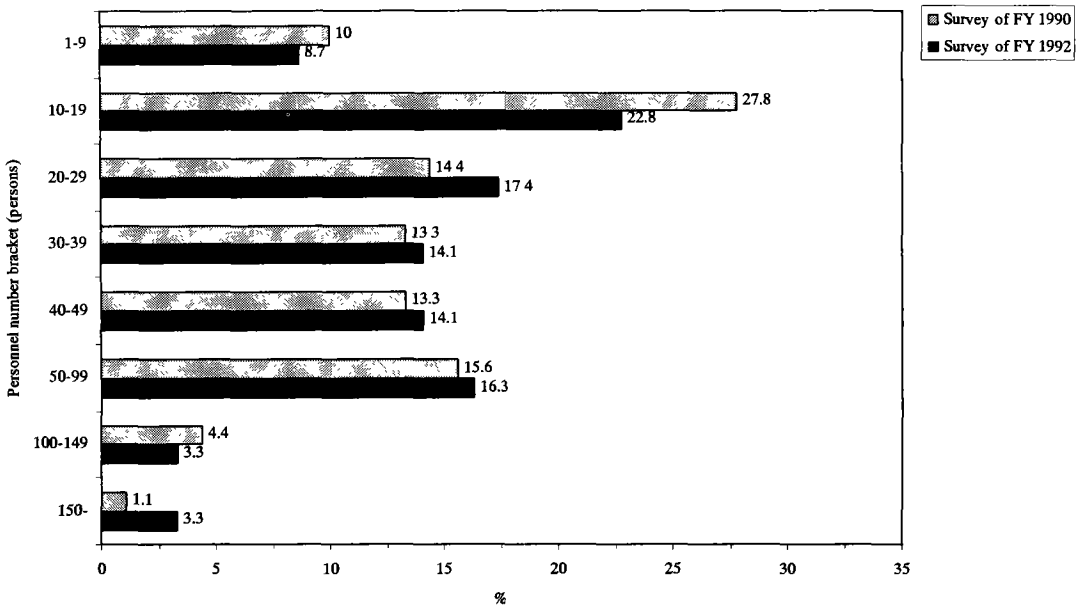


Fig. 4-2-7 (2) Percentages of regional research institutes by researcher number bracket (manufacturing industry category)

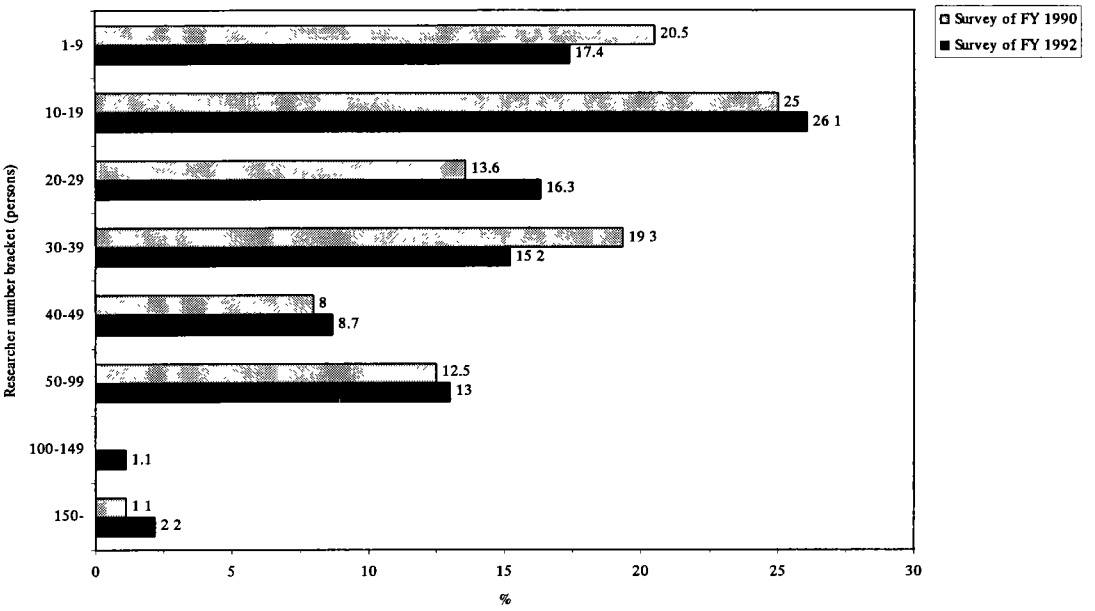
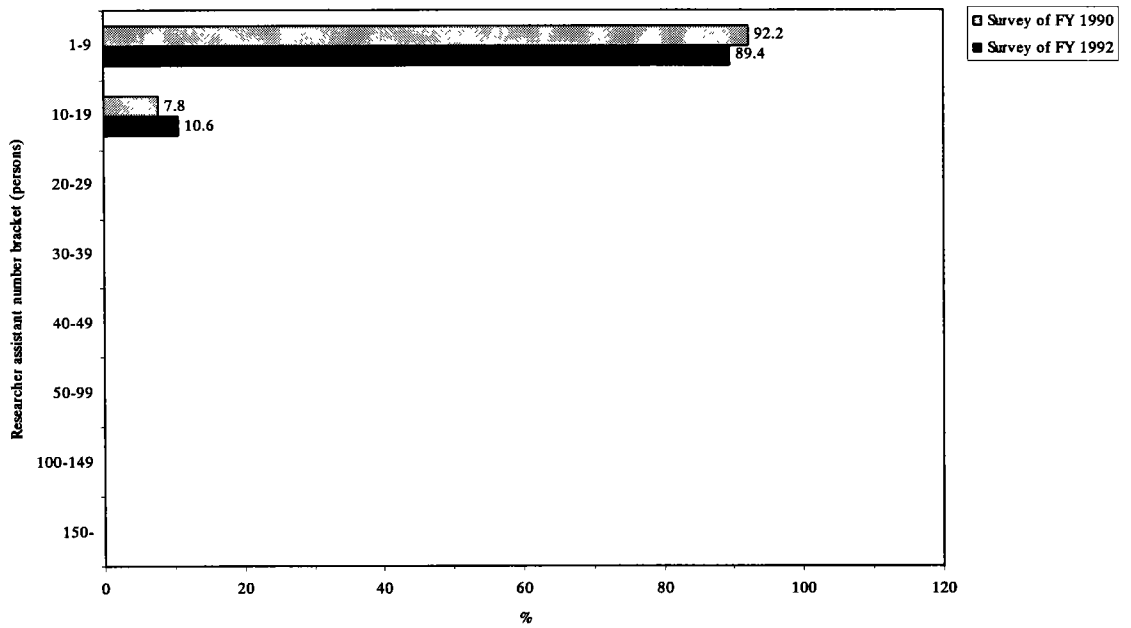


Fig. 4-2-7 (3) Percentages of regional research institutes by research assistant number bracket (manufacturing industry category)



2) Age structure

With regard to the age structure of researchers of regional research institutes in FY 1992, the percentages of the age brackets of health and environment category, agriculture, forestry and fisheries category and manufacturing industry category are shown below in comparison with those of FY 1990.

A. Regional research institutes of health and environment category

The average age of researchers in FY 1992 was 42.4, showing a progress in aging compared to 40.5 of FY 1990.

The "45 to less than 55 years old" bracket which accounted for 23% in FY 1990 increased to 30% in FY 1992. On the other hand, the "35 to less than 45 years old" bracket decreased from 44% to 40%, and the "25 to less than 35 years old" bracket decreased from 22% to 19%. Since the percentage of the "25 to less than 35 years old" bracket was smaller than those of the other age brackets and became lower, it can be seen that the employment of young researchers decreased (Fig. 4-2-8).

B. Regional research institutes of agriculture, forestry and fisheries category

The average age of researchers in FY 1992 was 40.2, showing a slight decline compared to 40.5 in FY 1990.

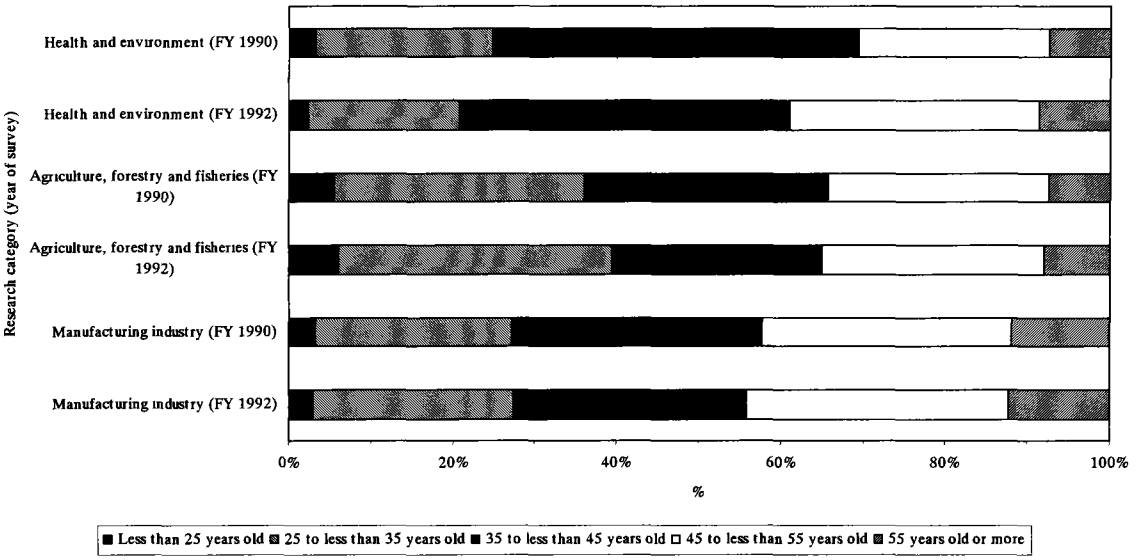
The "25 to less than 35 years old" bracket increased slightly from 31% of FY 1990 to 32% of FY 1992, and the "35 to less than 45 years old" bracket decreased slightly from 27% of FY 1990 to 25% of FY 1992. The percentage of young researchers bracket was rather high, and the percentages of the respective age brackets were almost stable (Fig. 4-2-8).

C. Regional research institutes of manufacturing industry category

The average age of researchers in FY 1992 was 42.0, showing a slight rise compared to 41.8 of FY 1990.

The "35 to less than 45 years old" bracket decreased from 30% of FY 1990 to 28% of FY 1992, while the "45 to less than 55 years old" bracket increased from 30% to 32%. Compared to the agriculture, forestry and fisheries category, the percentage of young researchers was smaller, to show a progress of aging (Fig. 4-2-8).

Fig. 4-2-8 Age structures of researchers of regional research institutes



3) Education structure and doctorate holders

The education structures and the numbers of doctors among the researchers of regional research institutes are shown below respectively for the health and environment category, the agriculture, forestry and fisheries category and the manufacturing industry category.

A. Regional research institutes of health and environment category

As for the education structure of researchers, the percentage of researchers completing the doctoral course increased from 5% of FY 1990 to 8% of FY 1992 and those completing the master course increased from 17% to 20%. On the other hand, the percentage of university graduate researchers decreased from 67% to 64% (Fig. 4-2-9). The health and environment category was higher in the percentage of higher education than the other categories.

Doctorate holders existed in 70% of institutions, showing an increase from 67% of FY 1990. The percentage of institutions having 10 or more doctors increased from 12% of FY 1990 to 16% of FY 1992.

B. Regional research institutes of agriculture, forestry and fisheries category

With regard to the education structure of researchers, the percentage of researchers completing the doctoral course increased from 1% of FY 1990 to 2% of FY 1992 and that of the master's course increased from 13% to 16%. The percentage of university graduate researchers also increased from 71% to 72% (Fig. 4-2-9).

Doctorate holders existed in 44% of institutions, showing an increase from 39% of FY 1990. The percentage of institutions having 10 or more doctorate holders increased slightly from 1% of FY 1990 to 2% of FY 1992.

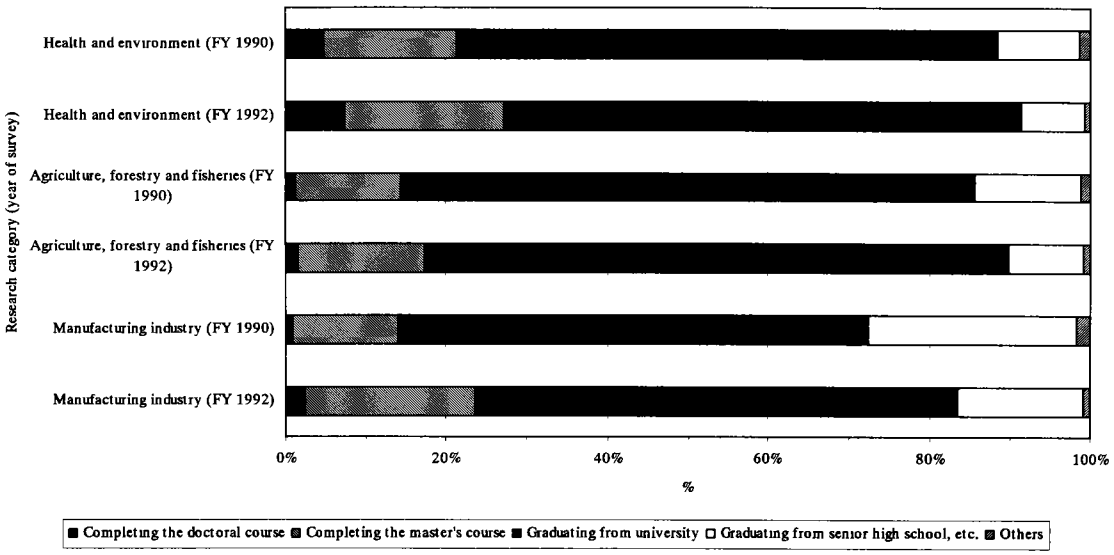
C. Regional research institutes of manufacturing industry category

As for the education structure of researchers, the percentage of researchers completing the doctoral course increased from 1% of FY 1990 to 3% of FY 1992, and that of the master's

course increased from 13% to 21%. The percentage of university graduate researchers also increased from 58% to 60% (Fig. 4-2-9).

Doctorate holders existed in 51% or institutions, showing a large increase from 33% of FY 1990. The percentage of institutions having 10 or more doctorate holders also greatly increased from 2% of FY 1990 to 7% of FY 1992.

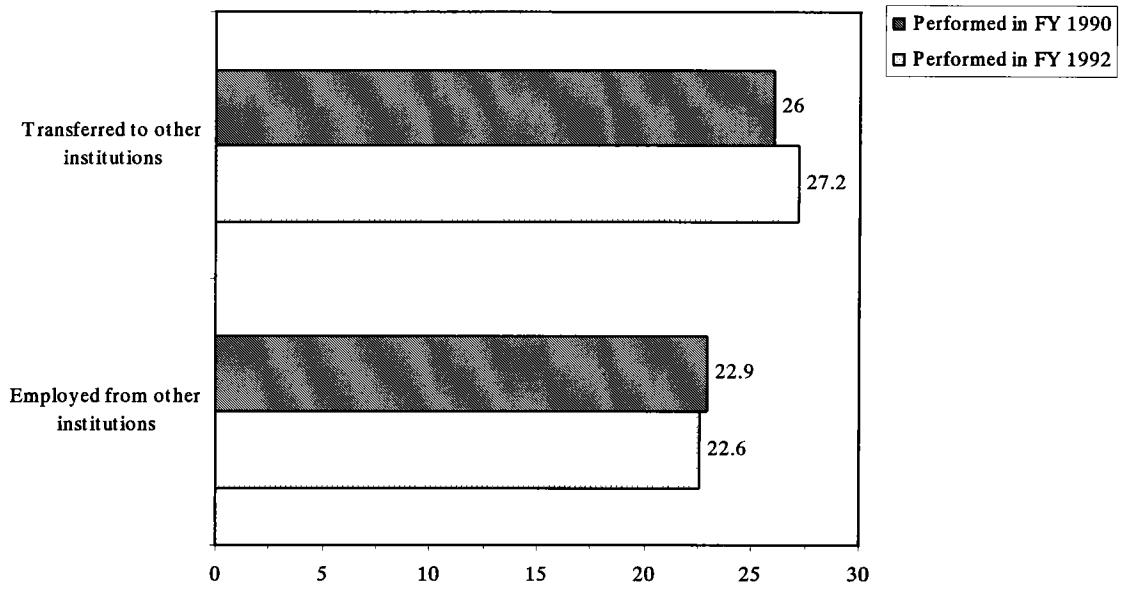
Fig. 4-2-9 Education structure of researchers of regional research institutes



4) Exchange or mobility of researchers

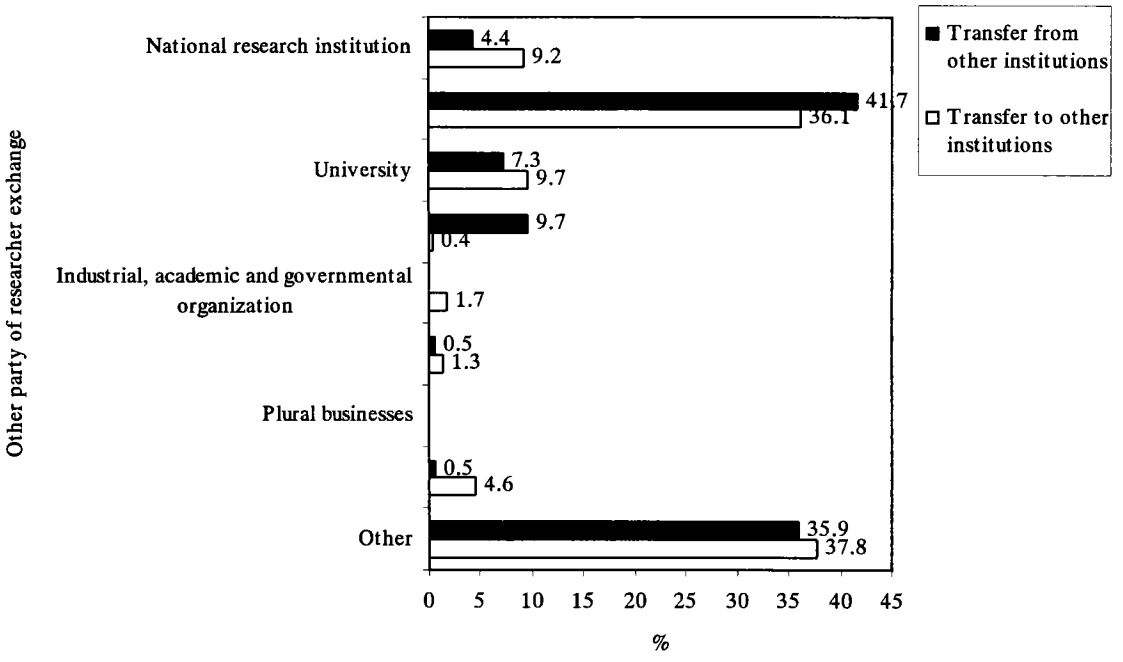
The institutions which employed researchers from other institutions in FY 1992 accounted for 27%, showing almost the same percentage as 26% of FY 1990. On the other hand, the institutions which transferred researchers to other institutions accounted for 23% in FY 1992, the same percentage (23%) as found in FY 1990 (Fig. 4-2-10).

Fig. 4-2-10 Percentages of regional research institutes which employed researchers from other institutions and transferred researchers to other institutions



With regard to the other parties of exchange or transfer, with all the exchange or transfer cases as 100, the employment from "regional research institutes" accounted for the largest 42%, being followed by 10% of "university". The employment from "other" means the employment from an administrative organization, farm advisory organization or public health center, etc. As for the other parties to which researchers were transferred, "regional research institutes" accounted for 36%, "university", 10%, and "other", 38%. "Other" also means an administrative organization, etc. like the "other" for employment (Fig. 4-2-11).

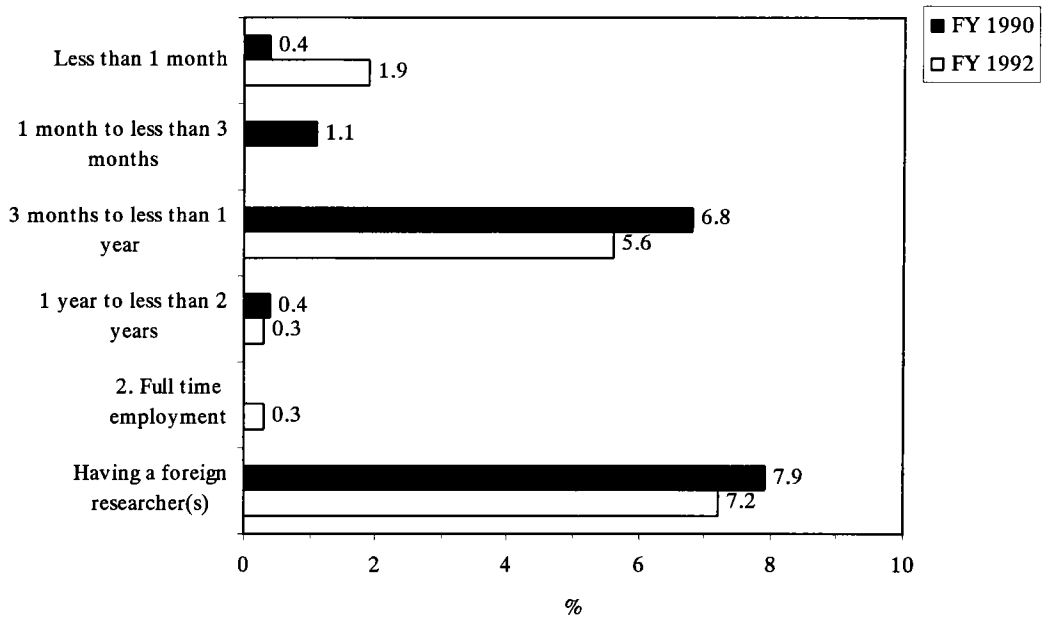
Fig. 4-2-11 Other parties for exchange of researchers of regional research institutes



5) Foreign researchers

The percentage of institutions which answered they had foreign researchers was 7%, showing a decrease from 9% of FY 1990. Of the institutions having foreign researchers, 78% accepted foreign researchers for a short period of "3 months to less than 1 year" (Fig. 4-2-12).

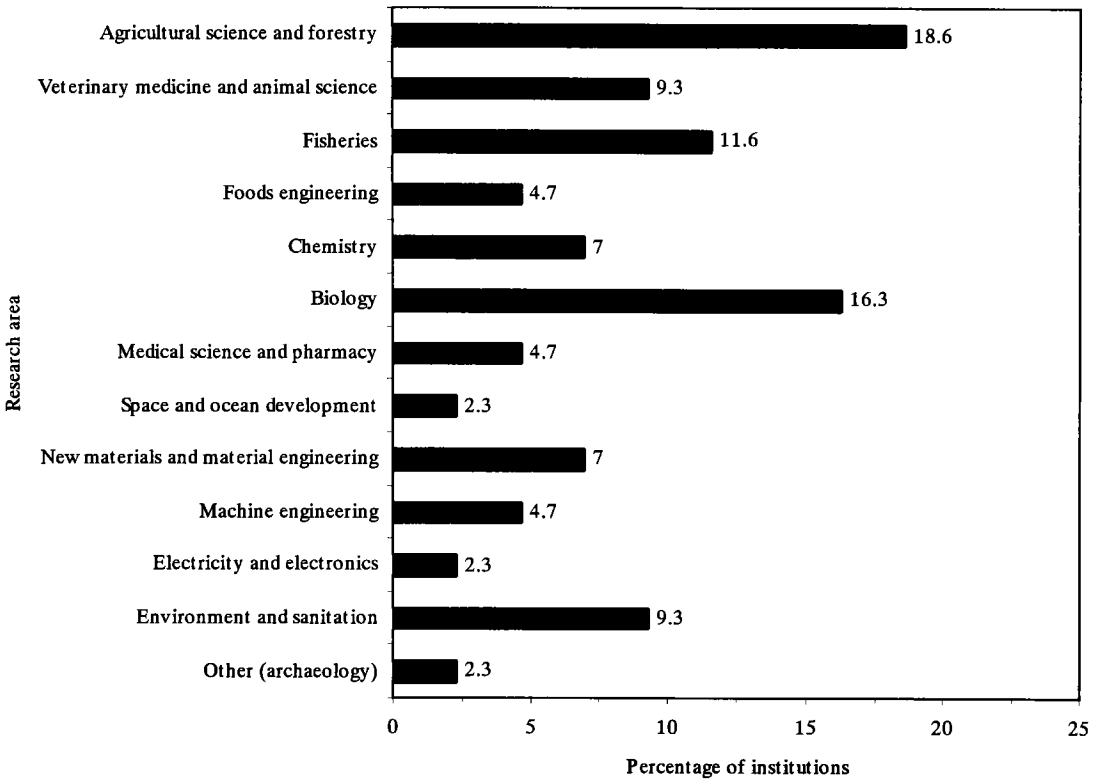
Fig. 4-2-12 Percentages of regional research institutes having foreign researchers, by acceptance period



Note: Because of plural answers, the total of the percentages of respective periods is larger than the percentage of "having a foreign researcher(s).

The main research areas of the regional research institutes which answered they had foreign researchers included all the areas, but the percentages of agricultural science and forestry (19%) area and life science (16%) area were high (Fig. 4-2-13).

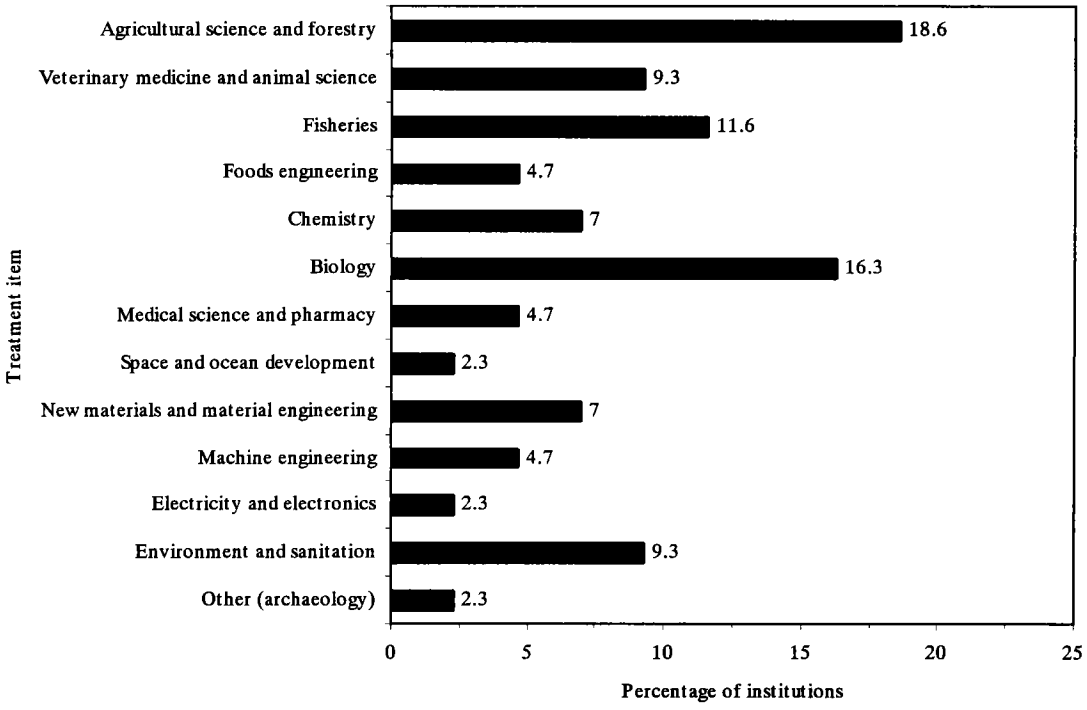
Fig. 4-2-13 Main research areas of regional research institutes answering they had foreign researchers



Note: The research areas are of institutions, and do not always agree with those of foreign researchers. Furthermore, up to two areas could be selected.

For the treatment for foreign researchers, regional research institutes which provided special treatment accounted for 66%. More than half of the special treatment cases were aids in housing (Fig-2-14).

Fig. 4-2-14 Treatment for foreign researchers



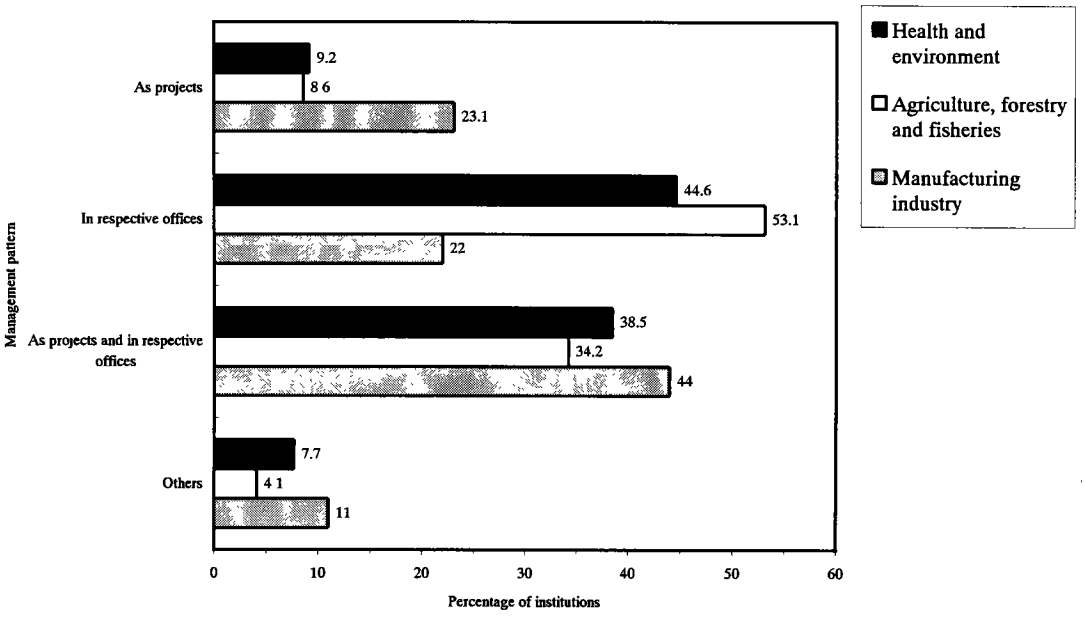
Note: "Other" included cooperation for site inspection, preventive measure against home sick, human exchange, aid of research data, or aid of living expenses, etc.

(4) Research management, and training and treatment of researchers

1) Research management patterns

As for research management patterns in regional research institutes, the institutions conducting research as projects accounted for the largest 23% in the manufacturing industry category, but only less than 10% in the health and environment category and the agriculture, forestry and fisheries category. On the other hand, the institutions conducting research in respective offices accounted for 53% in the agriculture, forestry and fisheries category, 45% in the health and environment category and 22% in the manufacturing industry category. The institutions conducting research both as projects and in respective offices accounted for 4.4% in the manufacturing industry category, 39% in the health and environment category and 34% in the agriculture, forestry and fisheries category. The institutions conducting research in any other pattern accounted for 11% in the manufacturing industry category, and in this case, most efforts were conducted as individuals (Fig. 4-2-15).

Fig. 4-2-15 Research management patterns in regional research institutes



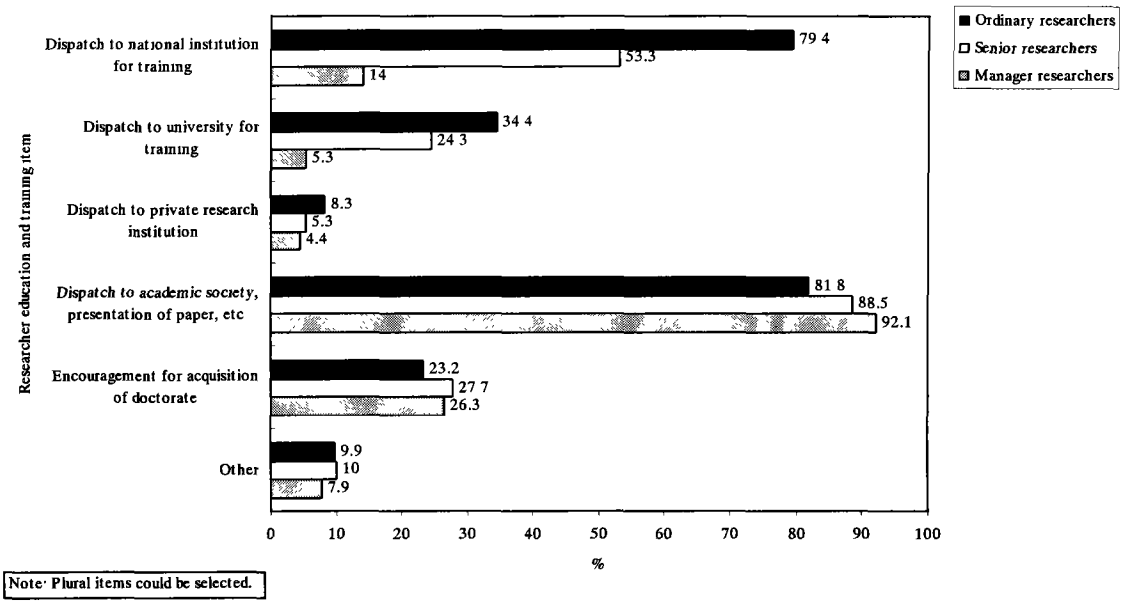
2) Education and training of researchers

The specific measures for educating and training researchers for respective researcher levels were investigated (plural items could be selected). For ordinary researchers, "dispatch to academic society, etc., presentation of paper, etc." accounted for 82%, being followed by 79% of "dispatch to national research institution for training" and 34% "dispatch to university for training".

For senior researchers, "dispatch to academic society, etc., presentation of paper, etc." accounted for the largest 89%, being followed by very smaller 53% of "dispatch to national research institution for training" and 28% of "encouragement for acquisition of doctorate".

For manager researchers, "dispatch to academic society, etc., presentation of paper, etc." accounted for the largest 92%, being followed by 26% of "encouragement for acquisition of doctorate" (Fig. 4-2-16).

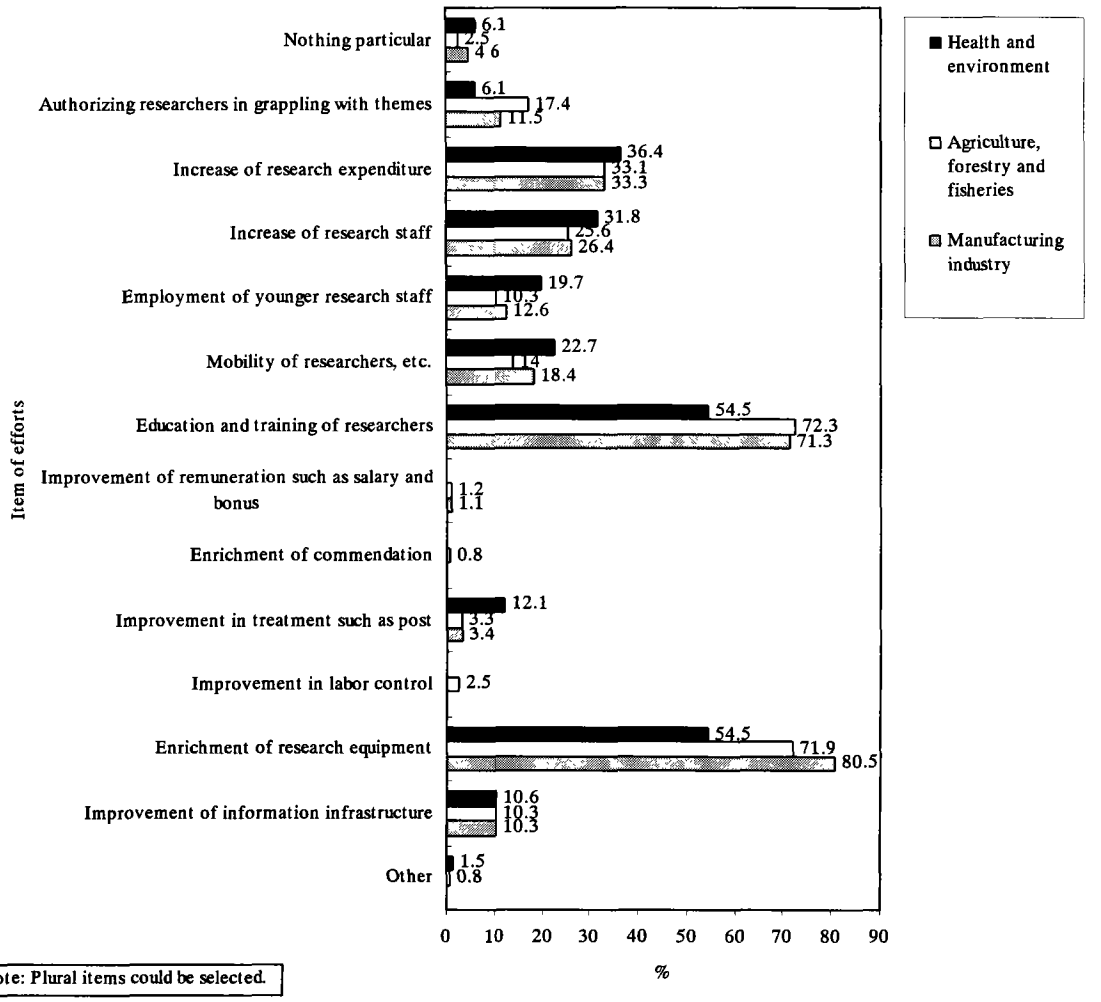
Fig. 4-2-16 Education and training of researchers in regional research institutes



3) Efforts for maintaining high research potentials

As for specific efforts for maintaining high research potentials (plural items could be selected), "enrichment of research equipment" and "education and training of researchers" were largest in all of the three research categories, being followed by "increase of research expenditure" and "increase of research staff" (Fig. 4-2-17).

Fig. 4-2-17 Efforts for maintaining high research potentials in regional research institutes

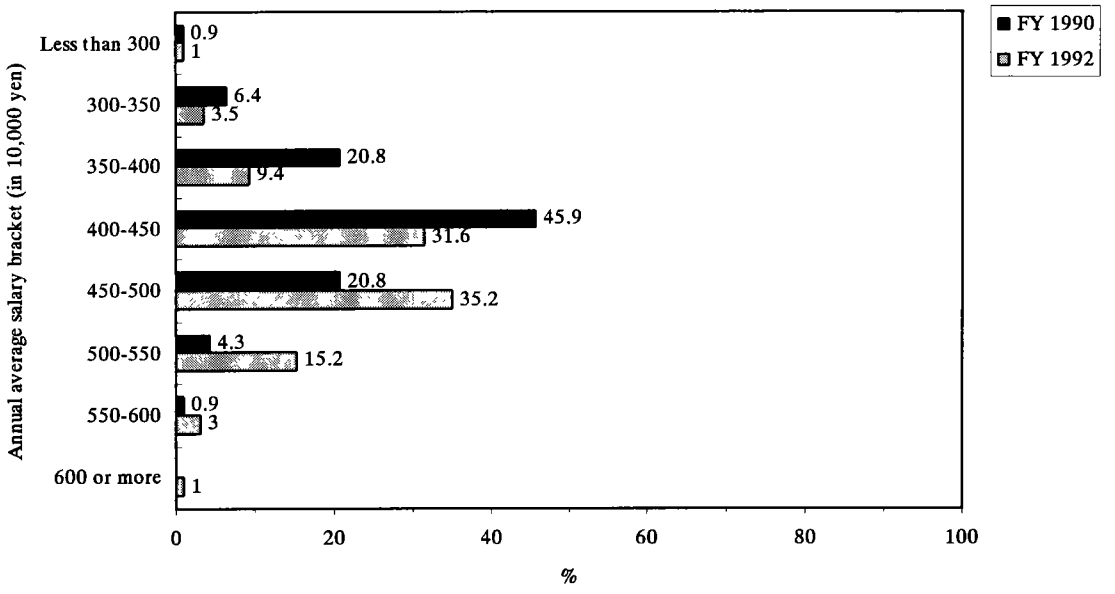


Note: Plural items could be selected.

4) Average annual salary

As a method for identifying the salary level, the total average annual salaries (including various allowances) of researchers of about 30 years old were investigated in the previous and present surveys. In the previous survey, "4.0 to less than 4.5 million yen" bracket was largest, but in the present survey, "4.5 to less than 5.0 million yen" bracket accounted for the largest 35%. In general, the percentages of the less than 4.0 million brackets decreased, but the percentages of the 4.5 million yen and more brackets increased, to show that the salary level of this age rose (Fig. 4-2-18).

Fig. 4-2-18 Annual average salaries of researchers of about 30 years old in regional research institutes

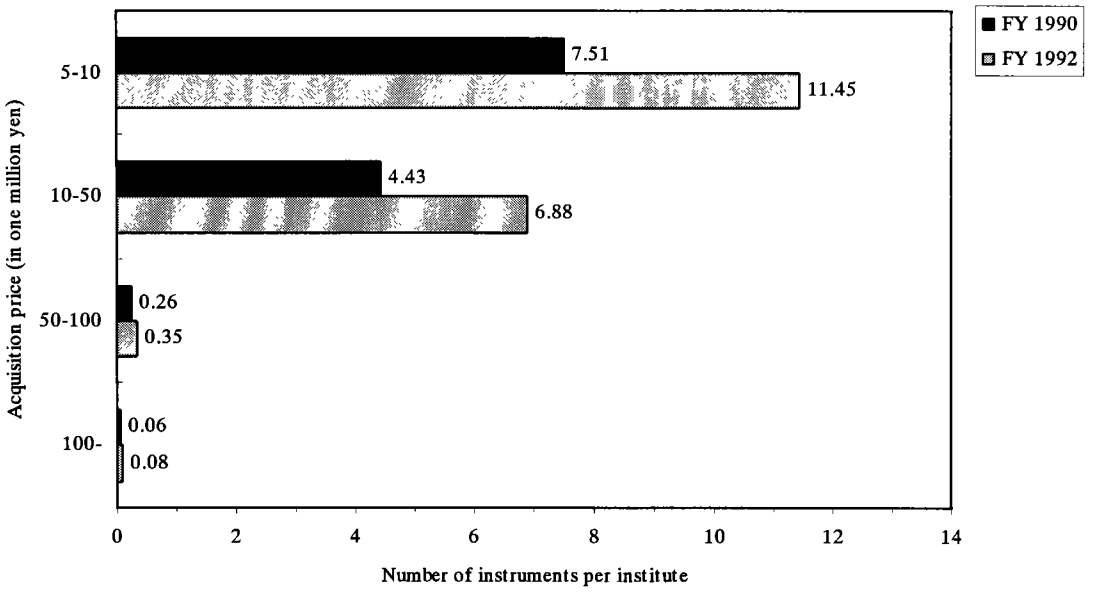


(5) Installation of measuring and testing instruments

1) Numbers of installed measuring and testing instruments per institute

In the present survey, the installation of relatively expensive instruments (5 million yen or more per unit) was investigated (200,000 yen or more per unit in the previous survey). The average number of installed instruments per institution increased in every price bracket compared to the previous survey, to show that relatively expensive units were installed increasingly (Fig. 4-2-19).

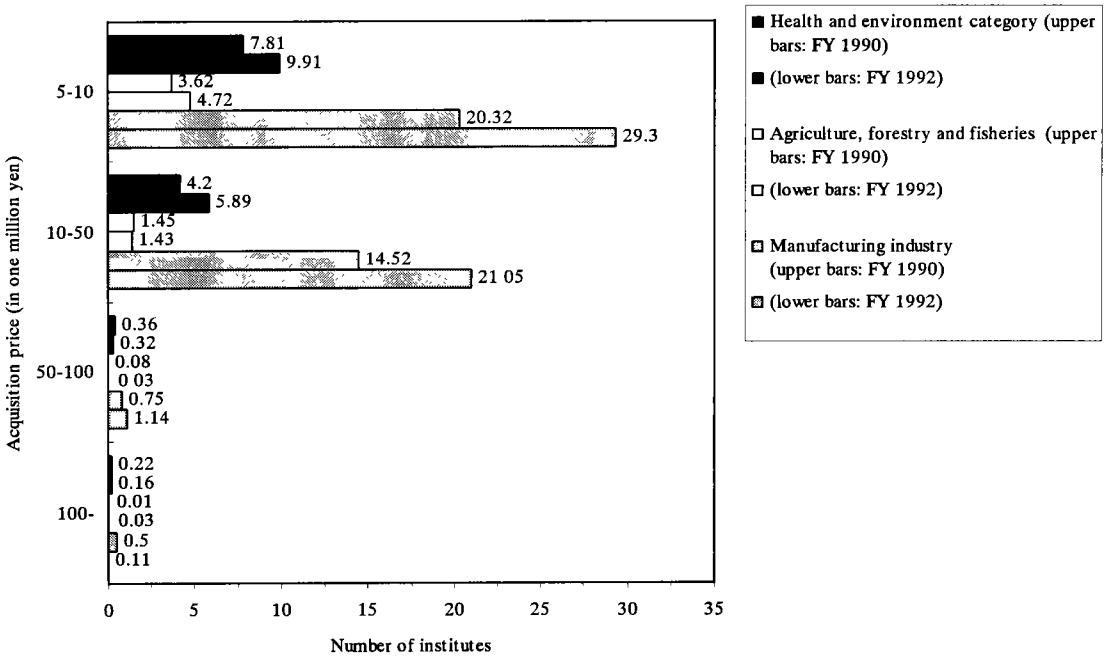
Fig. 4-2-19 Numbers of installed measuring and testing instruments per regional research institute



2) Numbers of installed measuring and testing instruments in the three research categories

As for the numbers of installed instruments in the respective research categories, the increase rate in the regional research institutes of manufacturing industry category was remarkable, being more than 40% in every price bracket. With regard to the other categories, the health and environment category increased in the 5 million yen to 50 million yen brackets, but decreased in the 50 million yen or more brackets, and the agriculture, forestry and fisheries category decreased in the other brackets than the 5 million yen to 10 million yen brackets.

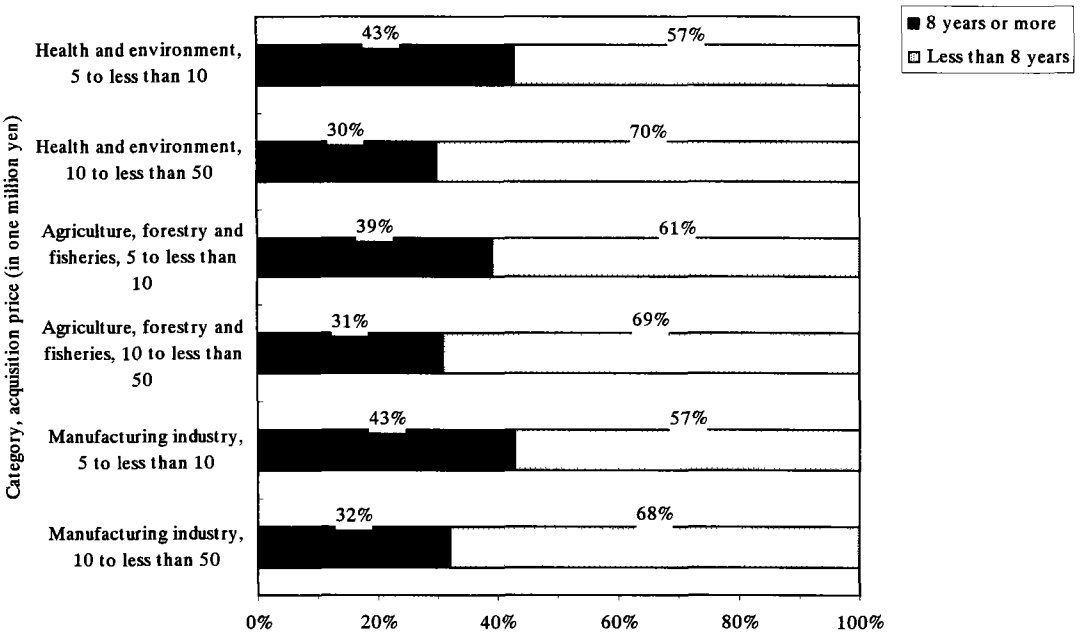
Fig. 4-2-20 Numbers of measuring and testing instruments per institution in the three research categories of regional research institutes



3) Percentages of instruments of 8 years or more after installation

The percentages of the instruments of 8 years or more after installation (in business accounting, the period of depreciation for machines is mostly about 8 years) in respective acquisition price brackets were investigated. In the 5 million yen to less than 10 million yen bracket, about 40% of instruments were 8 years or more after installation, and in the 10 million yen to less than 50 million yen bracket, about 30% of instruments were 8 years or more. The respective percentages in the three categories were almost the same (Fig. 4-2-21).

Fig. 4-2-21 Percentages of instruments of 8 years or more after installation in regional research institutes

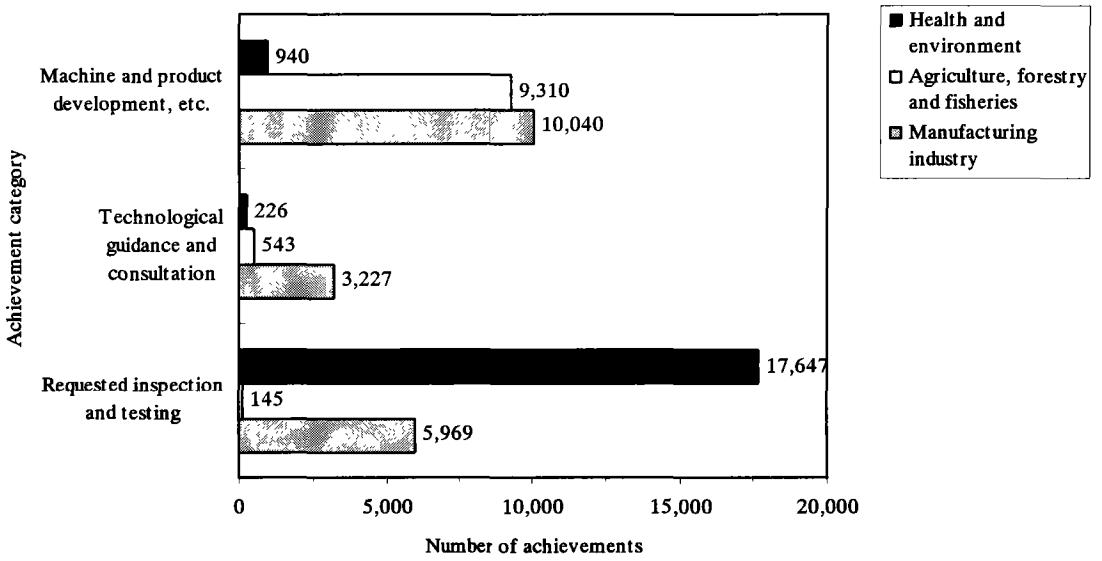


(6) Research achievements

1) Numbers of average research achievements per institute

Research achievements of respective institutes in FY 1992 were investigated for respective achievement categories of "apparatus and product development, etc.", "technological guidance and consultation", "requested inspection and testing" and "others". As for the numbers of research achievements by achievement category by research category, in the health and environment category, the number of achievements in the requested inspection and testing category was large (average 17646 achievements per institute), and in the agriculture, forestry and fisheries category, the number of achievements in the apparatus and product development category was large (average 9.3 achievements per institute). In the manufacturing industry category, the numbers of achievements in the apparatus and product development category and the technological guidance and consultation category were large (respectively average 10.0 achievements and 5960 achievements per institute). (Fig. 4-2-22)

Fig. 4-2-22 Numbers of research achievements per regional research institute



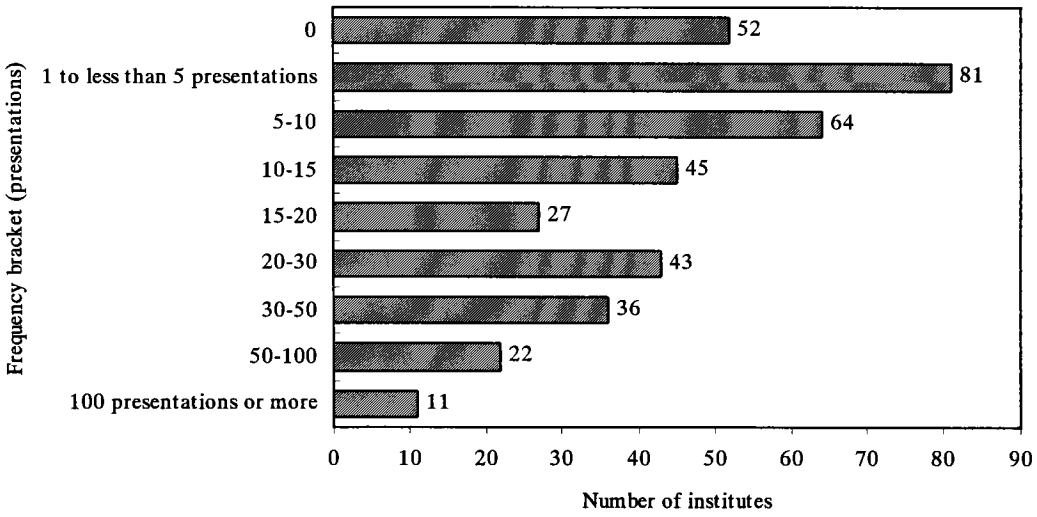
Note: The values of "apparatus and product development, etc." are multiplied by 1000 for easier graphic expression. (Actual values are 1/1000 of expressed values.)

2) Presentation of papers at academic societies, etc.

In the present survey, paper presentations at academic societies, etc. and the registrations of patents and new varieties in FY 1992 by respective institutes were investigated.

Papers were presented at academic societies, etc. by 329 institutes among 381 answering institutes, and the average number of presentations per institute was 18.86. In reference to respective frequency brackets, the number of institutes in the 1 to less than 5 presentations bracket was the largest 81, but the numbers of institutes were relatively dispersed in the respective frequency brackets (Fig. 4-2-23).

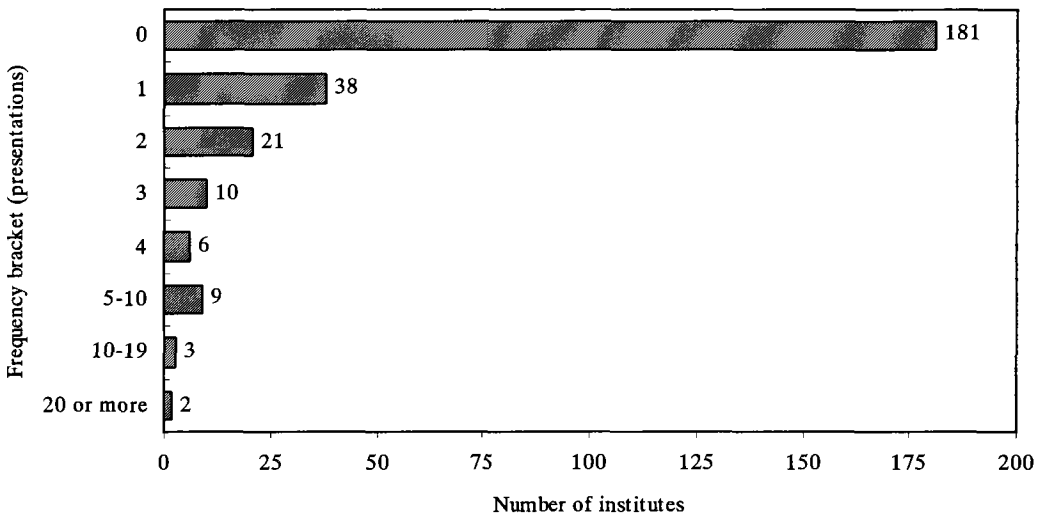
Fig. 4-2-23 Paper presentations at academic societies, etc. by regional research institutes



3) Registrations of patents, new varieties, etc.

Patents, new varieties, etc. were registered by 89 institutes corresponding to about one third of 270 answering institutes. The average number of registrations per institute was 1.00. In reference to the respective frequency brackets, the number of institutes in the 1 registration bracket was the largest 38, and the total number of institutes in the 1 to 3 registrations brackets was 69 (Fig. 4-2-24).

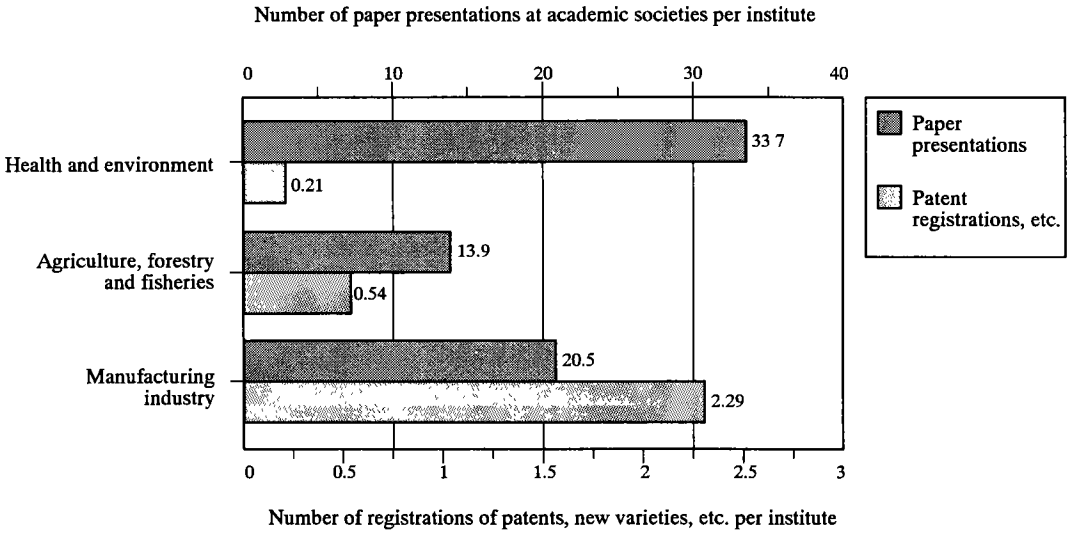
Fig. 4-2-24 Numbers of registrations of patents, new varieties, etc. by regional research institutes



4) Papers, patents, etc. in the respective research categories

As for the presentations of papers at academic societies, etc., and the registrations of patents, new varieties, etc. in the respective research categories, the health and environment category was large in the number of paper presentations, showing 33.7 presentations per institute. The manufacturing industry category was large in the number of patent registrations, etc., showing 2.29 registrations per institute (Fig. 4-2-25).

Fig. 4-2-25 Presentations of papers at academic societies, etc. and registrations of patents, new varieties, etc. per regional research institute in respective research categories

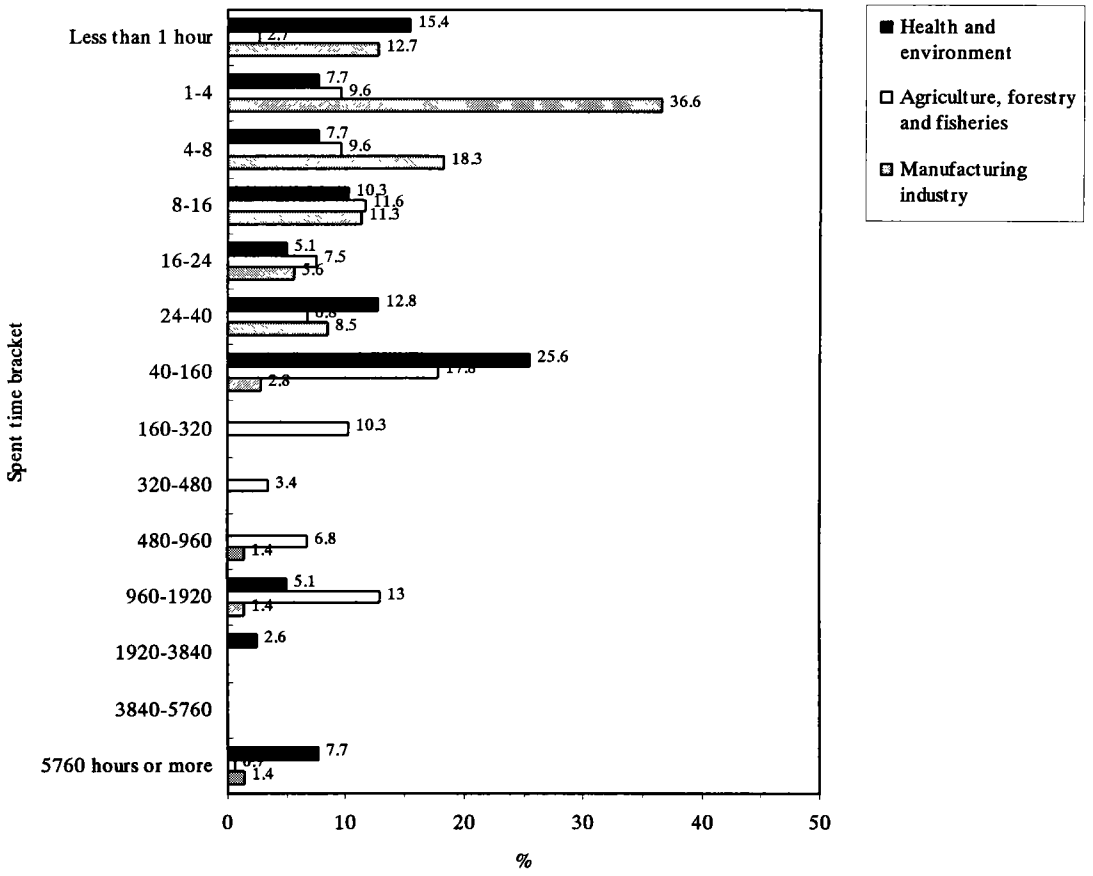


5) Per capita spent times per case of requested inspection or testing

For the inspections and tests conducted upon request in FY 1992, the per capita average spent times per case were investigated, and the average of all the cases was 756 hours.

By research category and by spent time bracket, most cases in the manufacturing industry category belonged to the shorter time brackets of less than 40 hours, but the agriculture, forestry and fisheries was large in the numbers of cases belonging to the long time brackets (Fig. 4-2-26).

Fig. 4-2-26 Per capita spent time per case of requested inspection or testing in regional research institutes

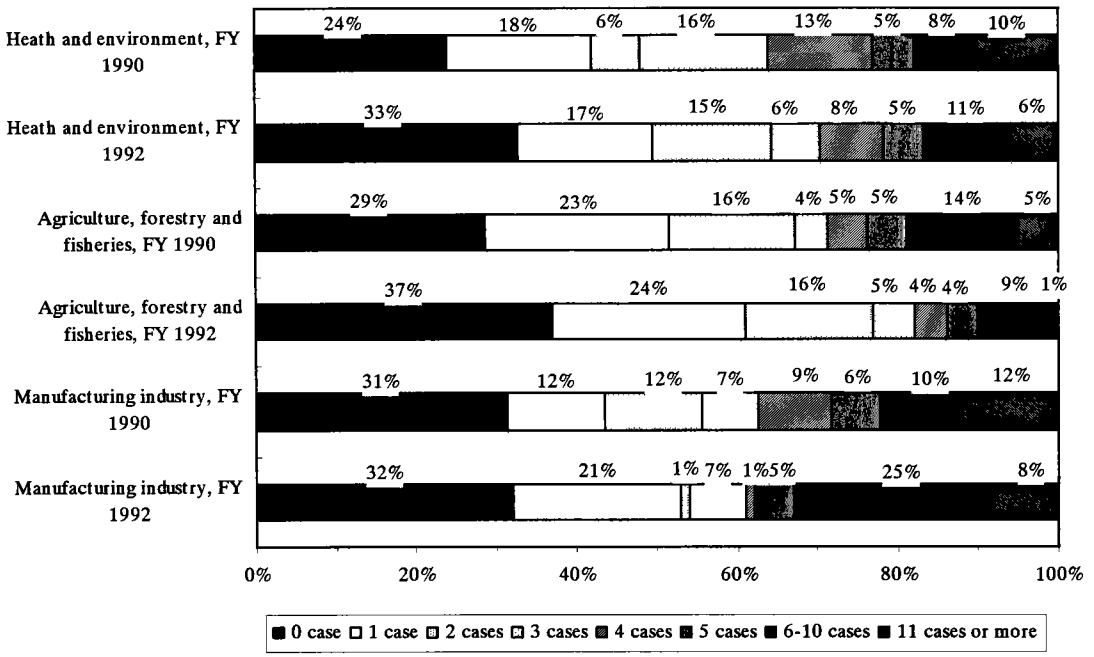


(7) Joint research

1) Number of joint research cases

The numbers of joint research cases per institute in the three research categories in the present FY 1992 survey were compared with those of the previous FY 1990 survey. The percentages of institutes having 0 joint research case increased in all the three research categories, and also in reference to the "number of cases" brackets, the agriculture, forestry and fisheries category and the health and environment category increased in the brackets smaller in the number of cases. However, in the manufacturing industry category, the 6 to 10 cases bracket relatively large in the number of cases increased (Fig. 4-2-27).

Fig. 4-2-27 Numbers of joint research cases per regional research institute



2) Other parties of joint research

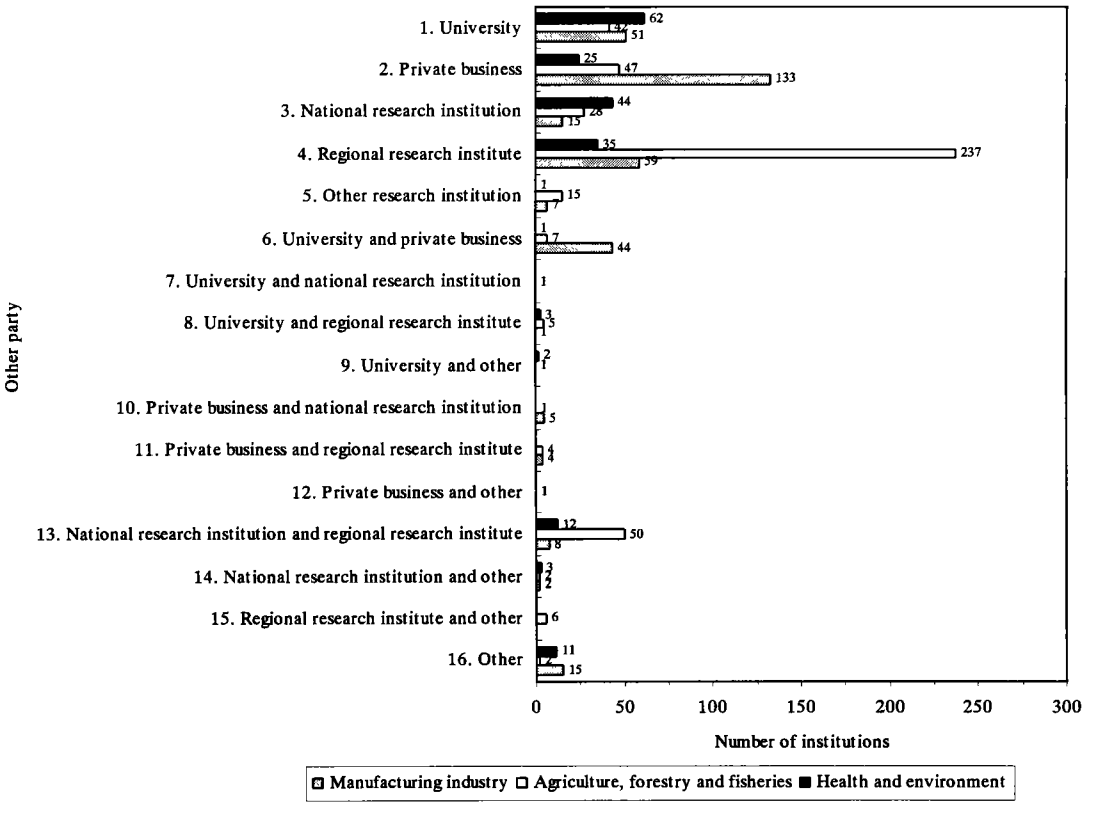
In the present survey, the other parties of joint research were classified into 16 party categories (including categories consisting of two or more other parties each), to investigate the numbers of cases belonging to the respective party categories.

As for the party categories of joint research in the respective three research categories, in the health and environment category, the number of cases with "university" was the largest 0.72 per institution, being followed by 0.51 case with "national research institution" and 0.41 case with "regional research institute".

In the agriculture, forestry and fisheries category, the number of cases with "regional research institute" was the largest 0.94 per institution, being followed by 0.20 case with "national research institution and regional research institute" and 0.19 case with "private business".

In the manufacturing industry category, the number of cases with "private business" was the largest 1.39 cases per institution, being followed by 0.61 case with "regional research institute" and 0.53 case with "university (Fig. 4-2-28).

Fig. 4-2-28 Other parties of joint research of regional research institutes by research category



3) Locations of other parties of joint research

Of the above 16 party categories, for the most selected six party categories ("university", "private business", "national research institution", "public ER institution", "university and private business" and "national research institution and regional research institute"), whether their locations were "intra-prefectural" or "extra-prefectural" were investigated (Fig. 4-2-29).

For party category 1 of "university", in the agriculture, forestry and fisheries category and the manufacturing industry category, "intra-prefecture" accounted for more than 60%, but in the health and environment category, "intra-prefecture" accounted for more than 40%.

For party category 2 of "private business", in the manufacturing industry category large in the number of cases, "intra-prefecture" accounted for nearly 90%. In the agriculture, forestry and fisheries category, "intra-prefecture" accounted for 70%, and in the health and environment category, 40%.

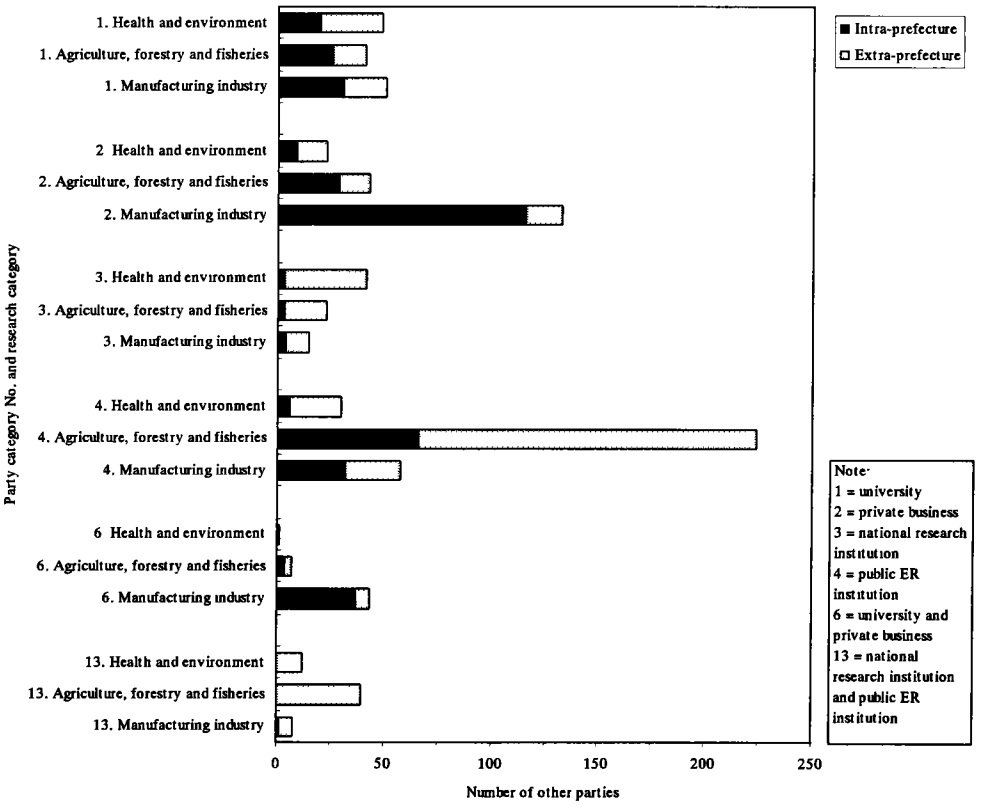
For party category 3 of "national research institution", in all the of health and environment category, the agriculture, forestry and fisheries category and the manufacturing industry category, "extra-prefecture" accounted for a majority respectively.

For party category 4 of "regional research institute", in the agriculture, forestry and fisheries category large in the number of cases, "intra-prefecture" accounted for 30%. In the manufacturing industry, "intra-prefecture" accounted for 55%, and in the health and environment category, 20%.

For party category 6 of "university and private business", "intra-prefecture" accounted for a majority in all the three research categories.

For party category 13 of "national research institution and regional research institute", "intra-prefecture" accounted for almost 100% in all the three research categories.

Fig. 4-2-29 Percentages of intra-prefecture and extra-prefecture locations of other parties of joint research by regional research institutes



(8) Allocation of budget

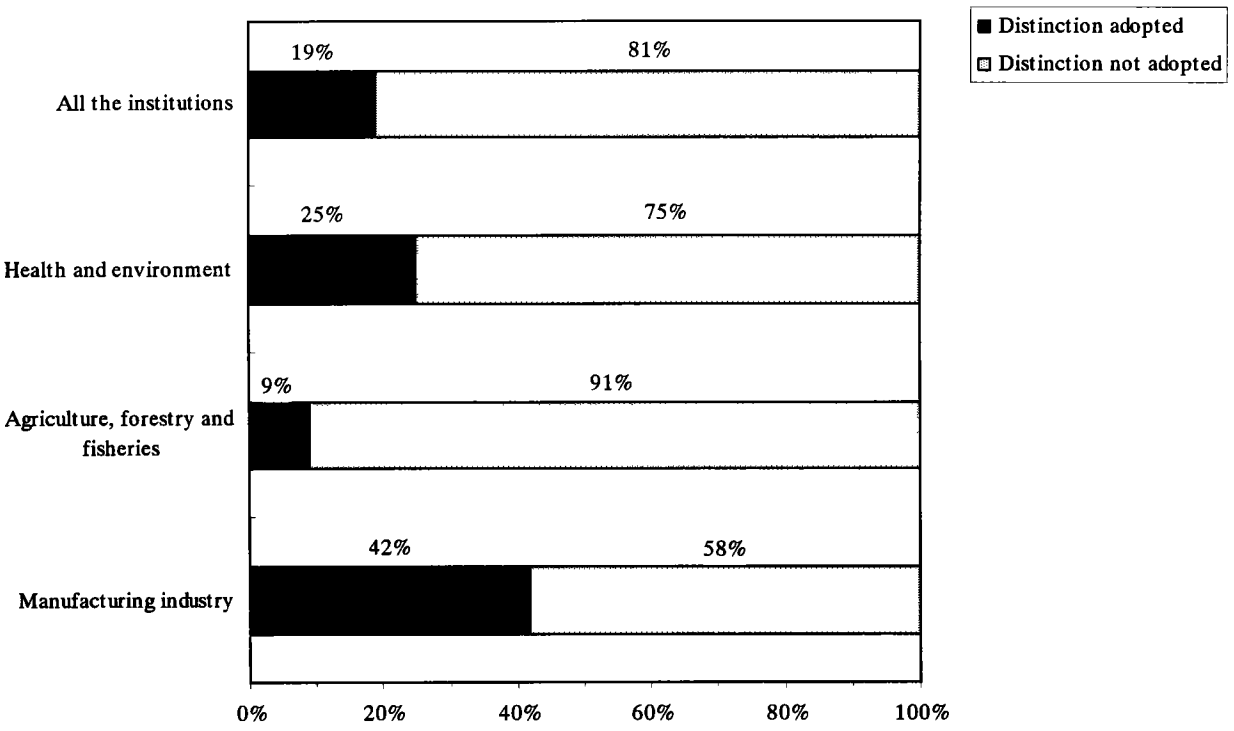
In the present survey, the allocation of research budget of FY 1992 to researchers was investigated to find 1) whether ordinary research expenditure was distinguished from special research expenditure, etc., 2) the amount and percentage of ordinary research expenditure in the entire budget, and 3) whether priority allocation in reference to research evaluation was adopted.

1) Ordinary research expenditure and special research expenditure

The institutions which distinguished ordinary research expenditure from special research expenditure accounted for 19% of all the institutions. Among the three research categories, those in the manufacturing industry category accounted for 42%, those in the health and environment category, 25%, and those in the agriculture, forestry and fisheries, 9% (Fig. 4-2-30).

The percentages of the ordinary research expenditure in the total budgets of the institutions adopting distinction were 27% in the manufacturing industry category, 20% in the health and environment category and 13% in the agriculture, forestry and fisheries category.

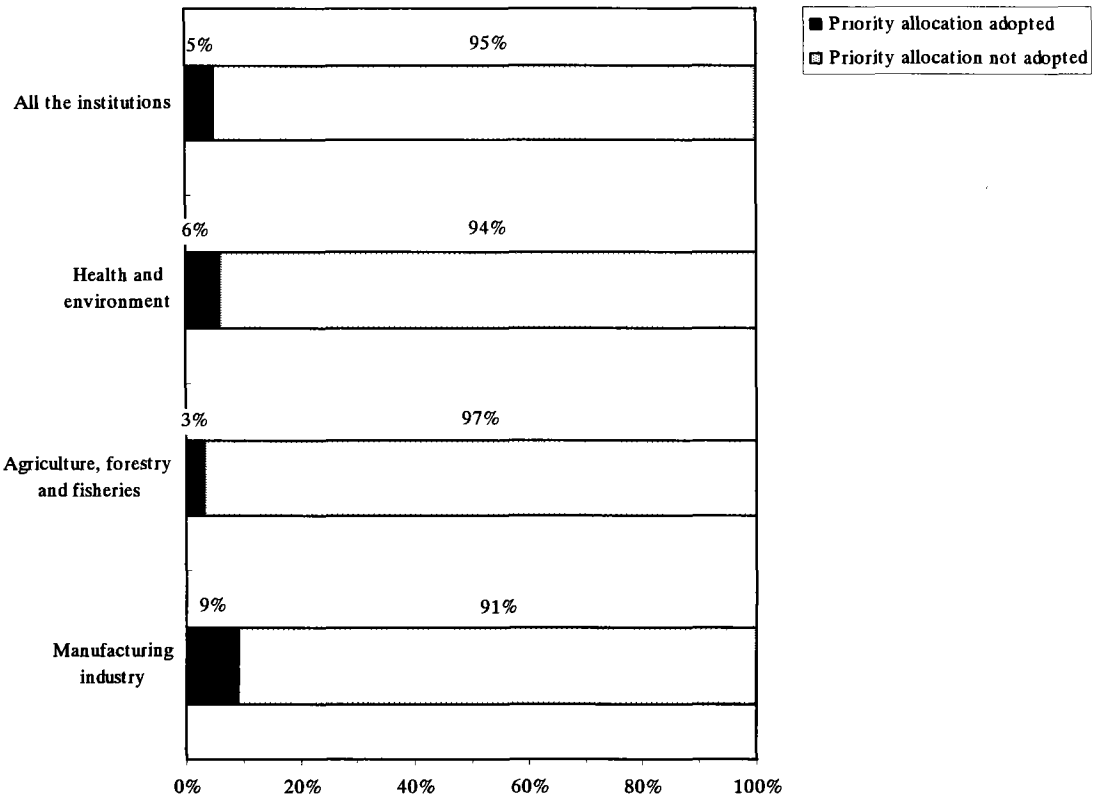
Fig. 4-2-30 Whether ordinary research expenditure was distinguished from special research expenditure in regional research institutes



2) Whether priority allocation was adopted

With regard to whether or not the institutes adopted the priority allocation method in reference to research evaluation in the allocation of research budget, the institutes which adopted it accounted for 5% of all the institutes. Among the three research categories, those in the manufacturing industry category accounted for large 9%, those in the health and environment category, 6%, and those in the agriculture, forestry and fisheries category, 3% (Fig. 4-2-31).

Fig. 4-2-31 Whether priority allocation was adopted for allocation of research budget by regional research institutes



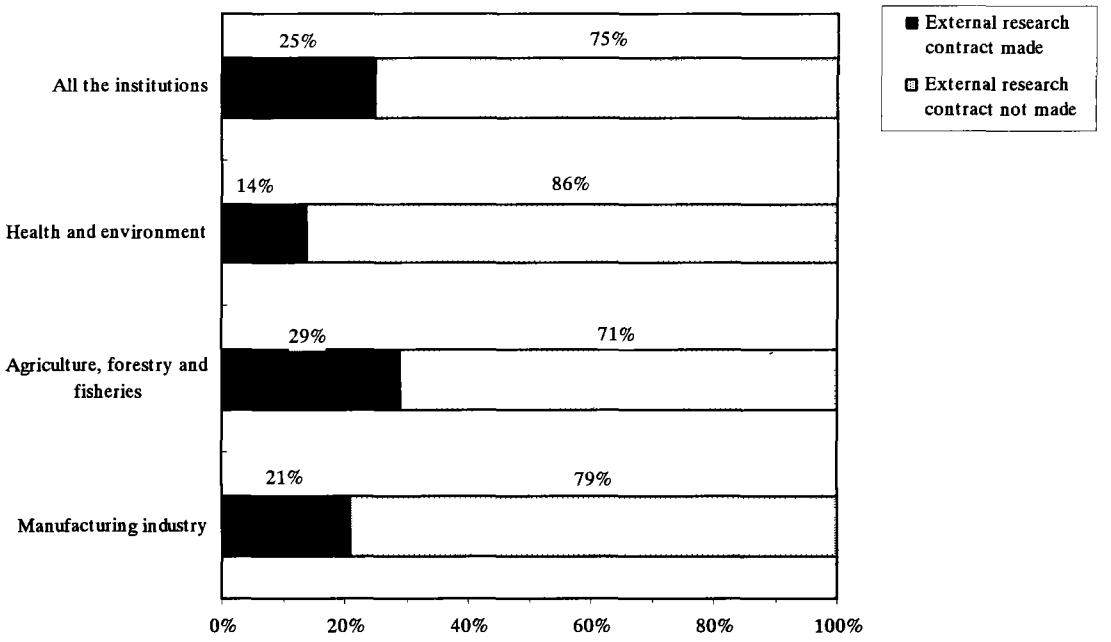
(9) External research contracts

In the present survey, whether or not any contract was made with any other party for external research (FY 1992) was investigated together with the numbers of external research contracts and the total amounts of expenditure for them.

1) Number of external research contracts

The number of institutes which made contracts with other parties for external research in FY 1992 was 106, accounting for 25% of all the 418 answering institutes. As for the percentages in the three research categories, those in the agriculture, forestry and fisheries category accounted for large 29%, those in the manufacturing industry, 21%, and those in the health and environment category, 14% (Fig. 4-2-32).

Fig. 4-2-32 Whether any contract was made by regional research institutes with any other party for external research

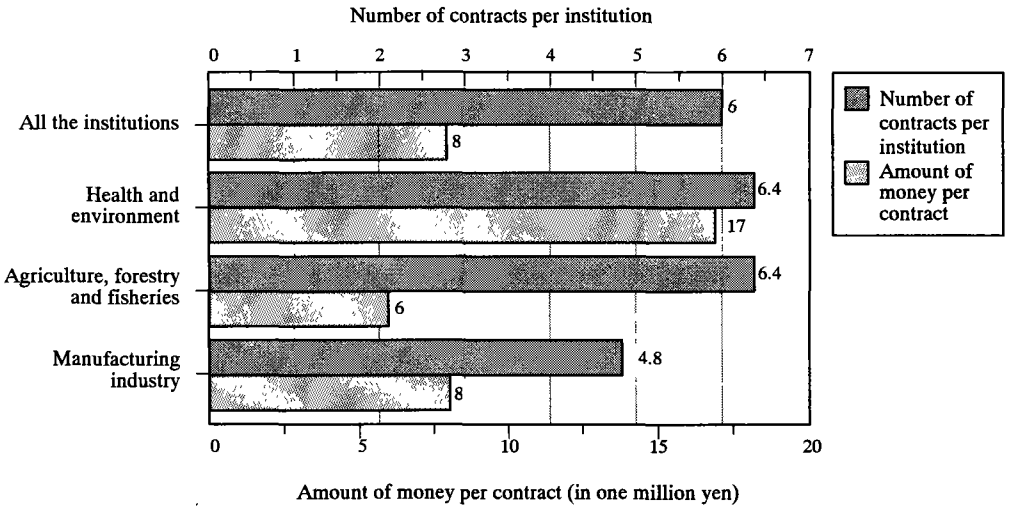


2) Number of external research contracts per institute, and amount of money per contract

For the institutes which made contracts with other parties for external research, the average number of external research contracts per institute of all the institutes was 6. Among the three research categories, the number of contracts in the health and environment category was 6.4, and that of the manufacturing industry category, 4.8.

As for the amount of money per external research contract, the average of all the institutes was 8 million yen. Among the three research categories, the average of the health and environment category was largest 17 million yen, that of the manufacturing industry category, 8 million yen, and that of the agriculture, forestry and fisheries category, 6 million yen (Fig. 4-2-33).

Fig. 4-2-33 Numbers of external research contracts per institution, and average amounts of money per institution, of regional research institutes



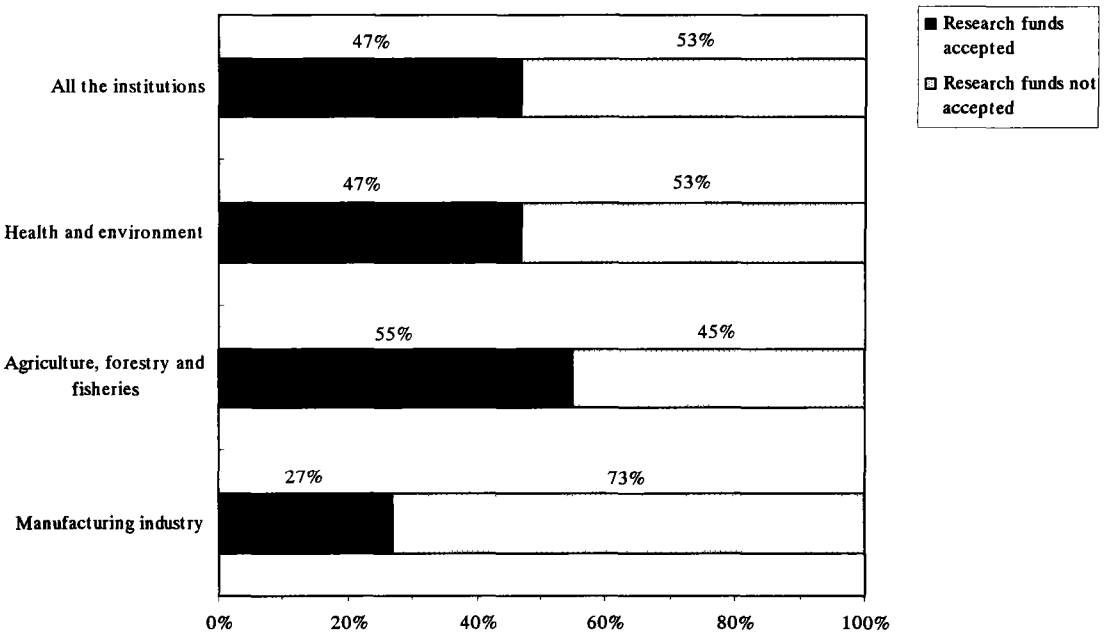
(10) Acceptance of research funds

In the present survey, whether or not research funds were accepted from external institutions in FY 1992 (excluding those for joint research) was investigated. The external institutions were classified into "national institution", "charitable corporation" and "private institution", and the accepted funds were classified into "contract" and "endowment, etc.".

1) Whether research funds were accepted

The number of institutions which accepted research funds from outside was 186, accounting for 47% of all the 399 answering institutes. Among the three research categories, those in the agriculture, forestry and fisheries category accounted for the largest 55%, those in the health and environment category, 47%, and those in the manufacturing industry category, 27%.

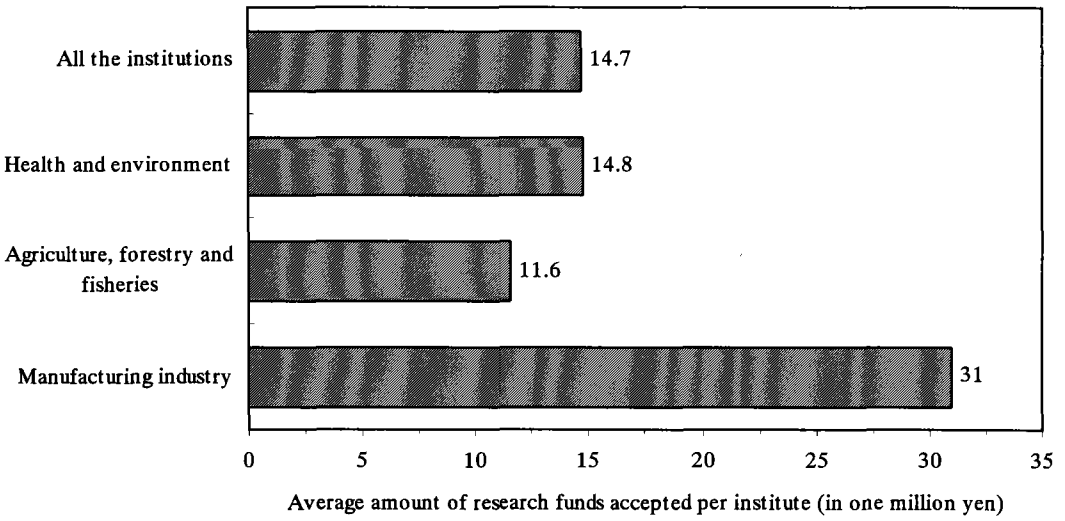
Fig. 4-2-34 Whether or not research funds were accepted by regional research institutes



2) Average amount of money accepted per institution

For the institutions which accepted research funds, the average amount of money per institution accepted by all the institutions was 15 million yen. Among the three research categories, the average amount of the manufacturing industry category was the largest 31 million yen, that of the health and environment category, 15 million yen, and that of the agriculture, forestry and fisheries category, 12 million yen (Fig. 4-2-35).

Fig. 4-2-35 Average amounts of research funds per institution accepted by regional research institutes

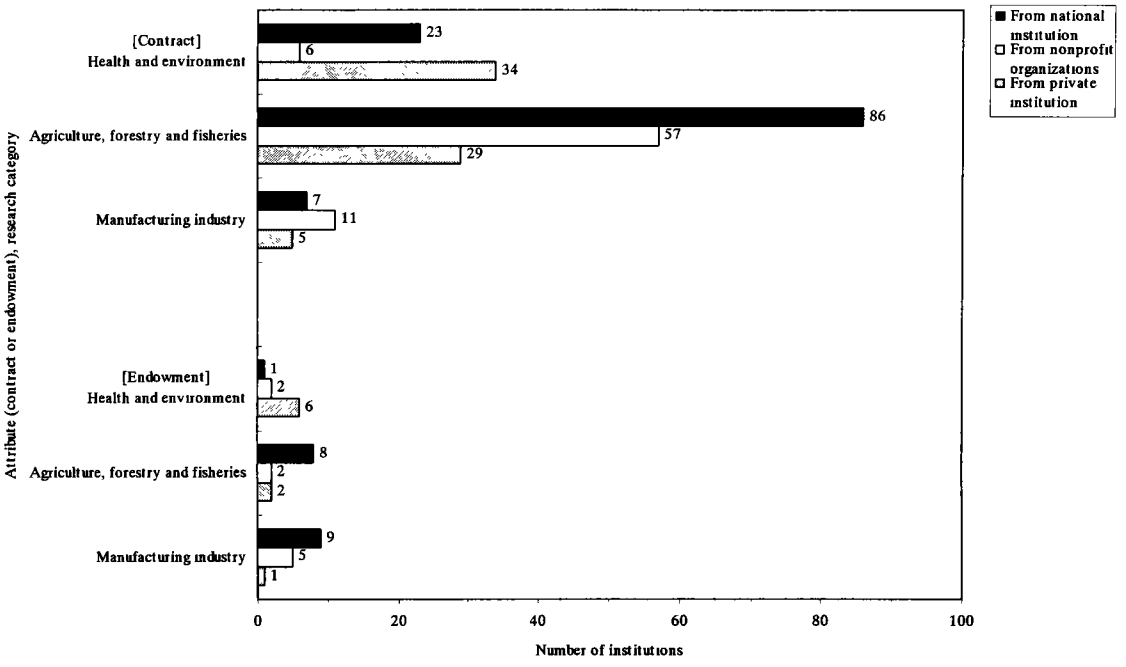


3) Classification of fund sources into national institutions, nonprofit organizations and private institutions, and classification of fund attributes into contracts and endowments

The institutions from which research funds were accepted were classified into national institutions, nonprofit organizations and private institutions, and the research funds accepted were classified into contracts and endowments, etc. in the three research categories. As for the research funds, most were accepted for "contract", and only a few institutions accepted for "endowment, etc." irrespective of the fund sources and the research categories.

In the case of contracts, many institutions in the agriculture, forestry and fisheries category accepted from "national institution" and "nonprofit organizations", and many institutions in the health and environment category accepted from "private institution" (Fig. 4-2-36).

Fig. 4-2-36 Numbers of regional research institutes accepting research funds by fund attribute by fund source



4-3 Comparison between Restructured Institutes and Non-Restructured Institutes

(1) Classification of surveyed institutes

Four hundred and fifty answering institutes were classified and defined as follows, and three groups of 107 "restructured" institutes, 275 "non-restructured" institutes and 35 "newly established" institutes were compared in staff, money, instruments, etc.

1) "Restructured" institutes (107)

= Institutes drastically restructured in the period from FY 1984 to FY 1992

2) "Non-restructured" institutes (275)

= Institutes established before FY 1983 and not drastically restructured in the period from FY 1984 to FY 1992

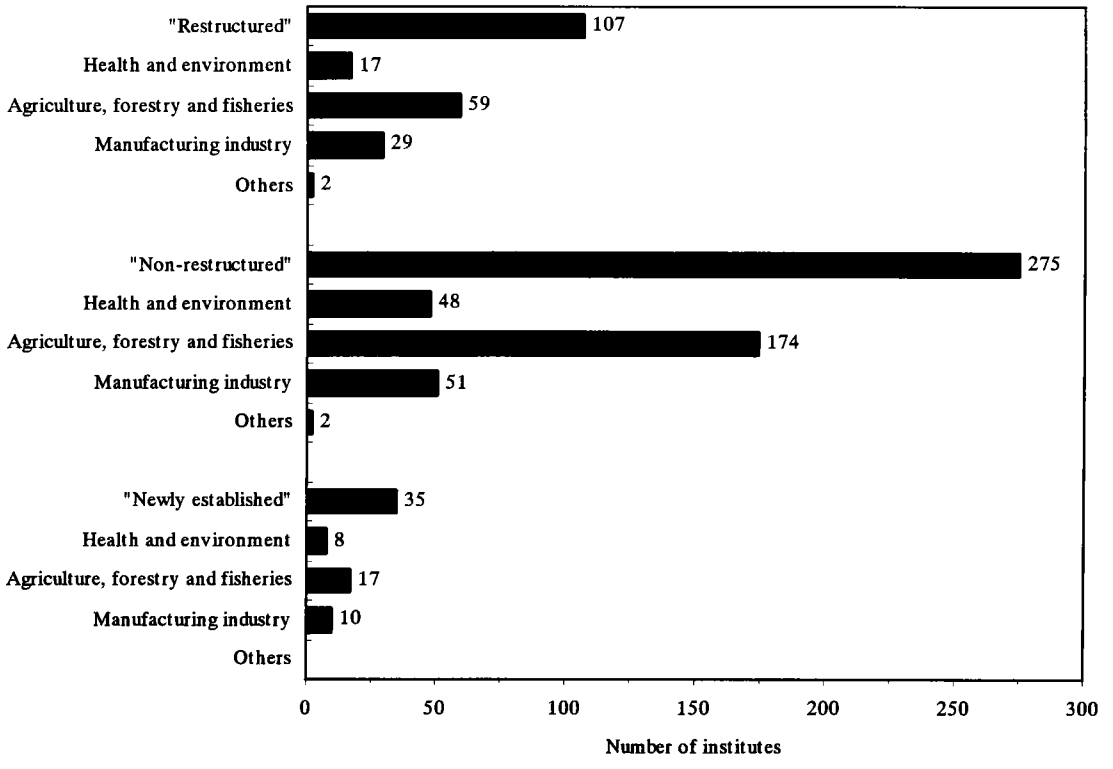
3) "Newly established" institutes (35)

= Institutes established after FY 1984

Of the 450 institutes, 33 institutes were established after FY 1993 or did not conduct any research. So, they were not classified into any group.

The numbers of the institutes of the respective groups by research category were as shown in Fig. 4-3-1.

Fig. 4-3-1 Classification of institutes into "restructured", "non-restructured" and "newly established" groups

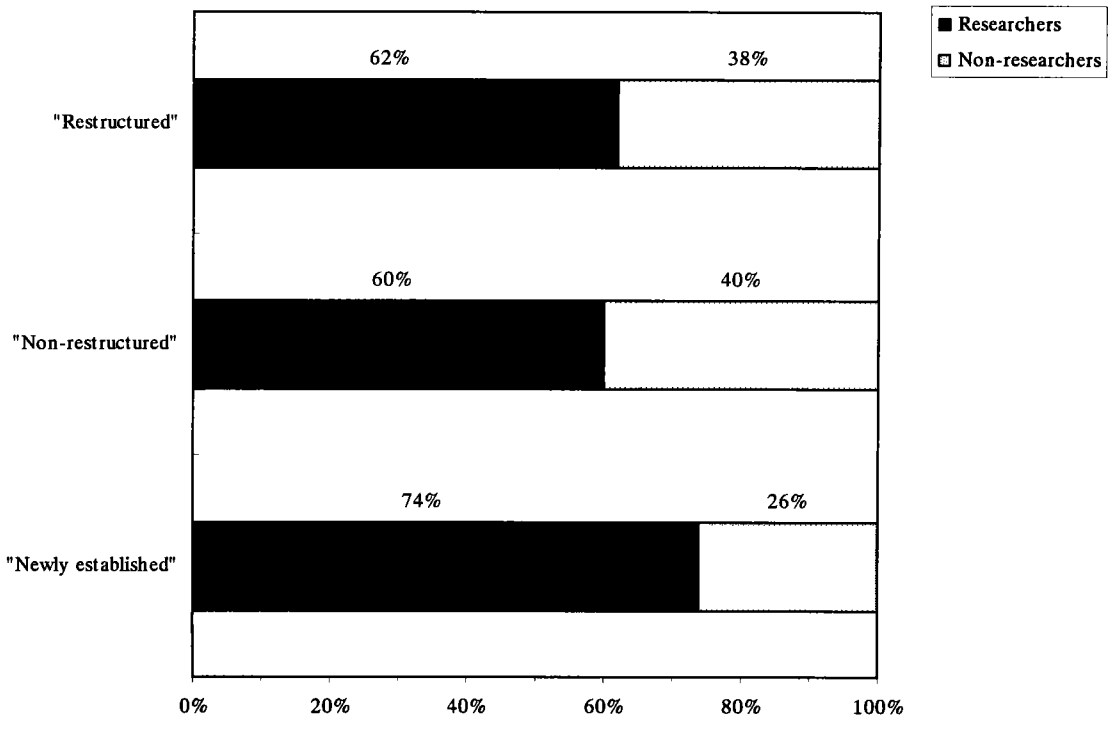


(2) Comparison between "restructured" group and "non-restructured" group

1) Percentages of researchers and non-researchers in all the personnel

If the percentage of the total number of researchers in the total number of personnel in each group is compared to that of non-researchers, the percentage of non-researchers of "restructured" group is smaller than that of "non-restructured" group (38% : 40%) (Fig. 4-3-2).

Fig. 4-3-2 Comparison between "restructured" and "non-restructured" of regional research institutes — Percentages of researchers and non-researchers in all the personnel

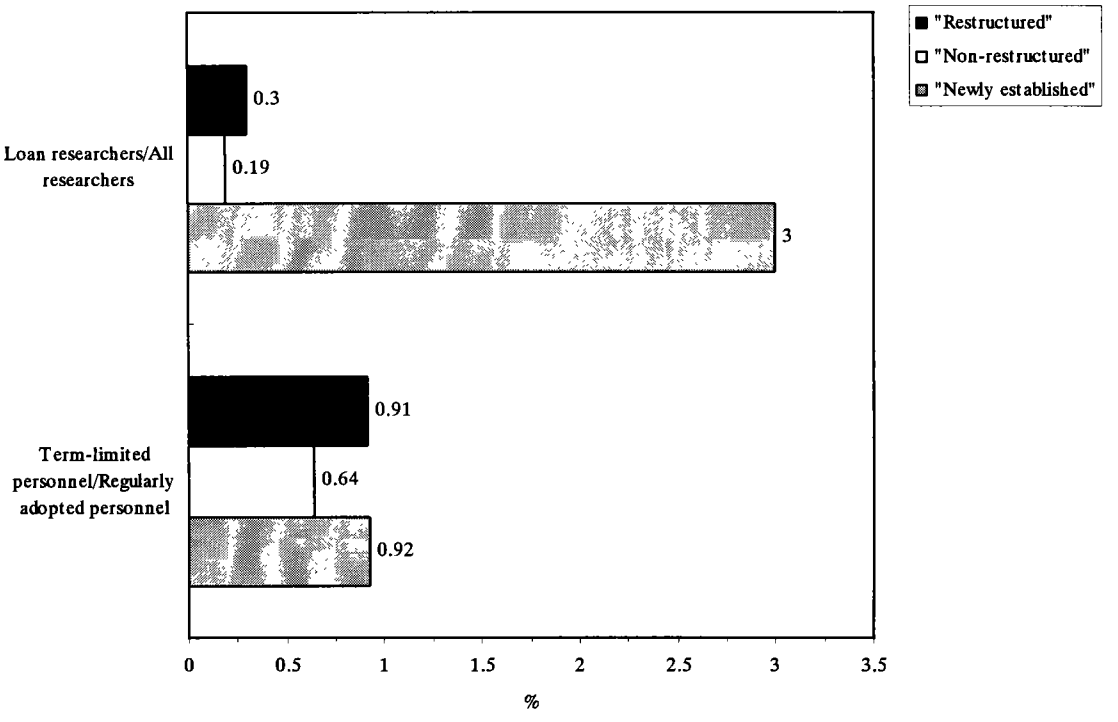


2) Percentages of loan researchers in all the researchers, etc.

As for the percentage of loan researchers in the total number of researchers in each group, the percentage of "restructured" is larger than that of "non-restructured.

Furthermore, also in the percentage of term-limited researchers in the total number of regularly adopted researchers, the percentage of "restructured" is larger than that of "non-restructured" (Fig. 4-3-3).

Fig. 4-3-3 Comparison between "restructured" and "non-restructured" — Percentages of loan researchers in all the researchers, and percentages of term-limited personnel in all the regularly adopted personnel

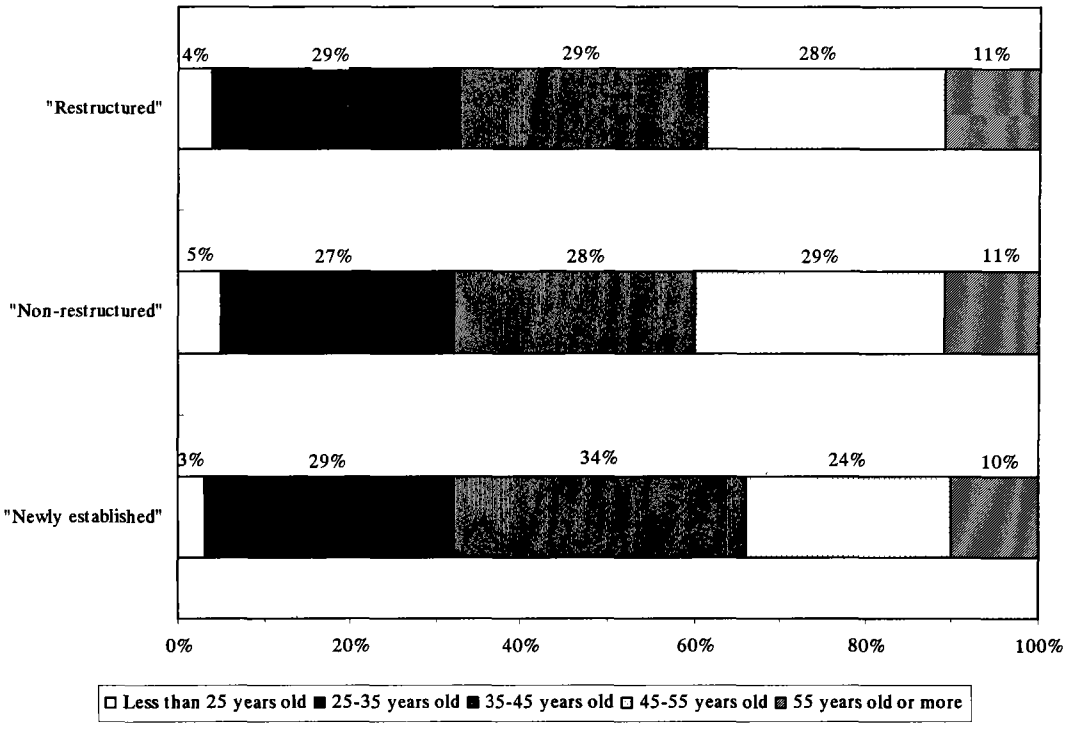


3) Age structure

In the percentages of researchers by age bracket of each group, the total percentage of the 25 to 45 years old brackets of "restructured" is larger than that of "non-restructured" (Fig. 4-3-4).

If the average ages of researchers obtained from the respective institutes are simply averaged in each group, the average age of "restructured" is 40.79, and that of "non-restructured", 41.28, the former group being younger.

Fig. 4-3-4 Comparison between "restructured" and "non-restructured" of regional research institutes — Age structure

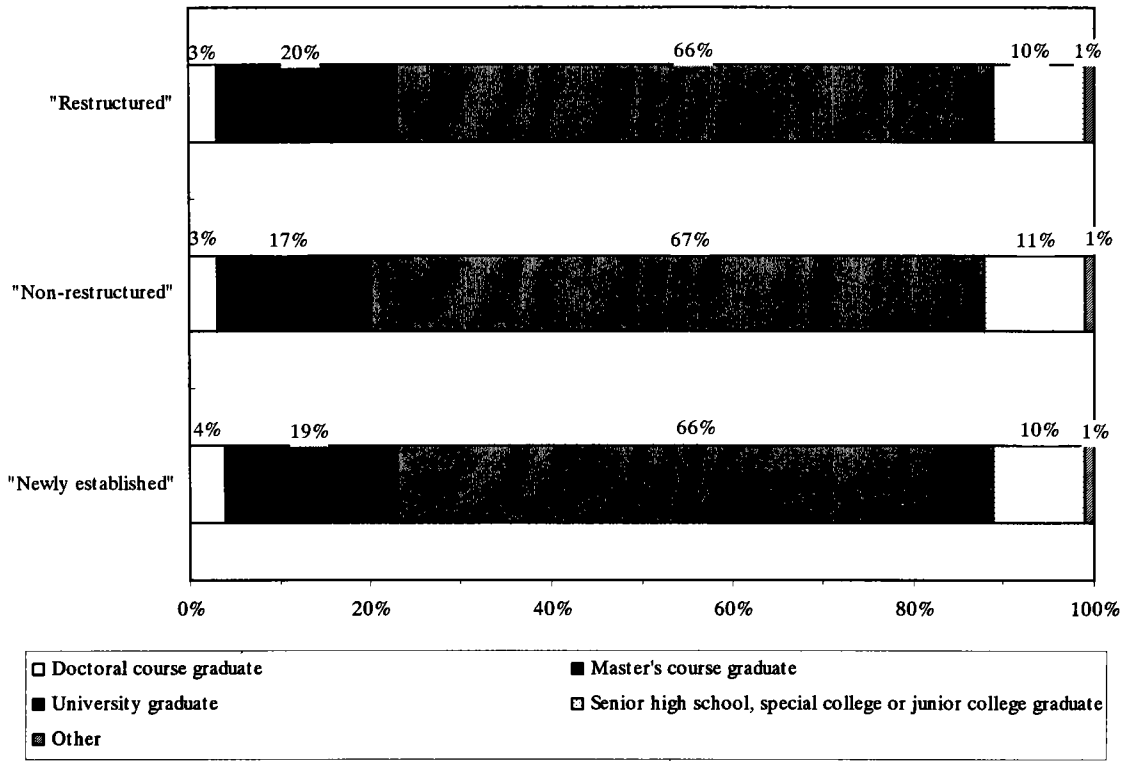


4) Education structure

In the percentages of researchers by education of each group, the percentage of researchers completing the master's course was larger in "restructured" group (Fig. 4-3-5).

Furthermore, the percentage of doctors in all the researchers of "restructured" was 7.5%, and that of "non-restructured", 8.3%, the latter group being larger.

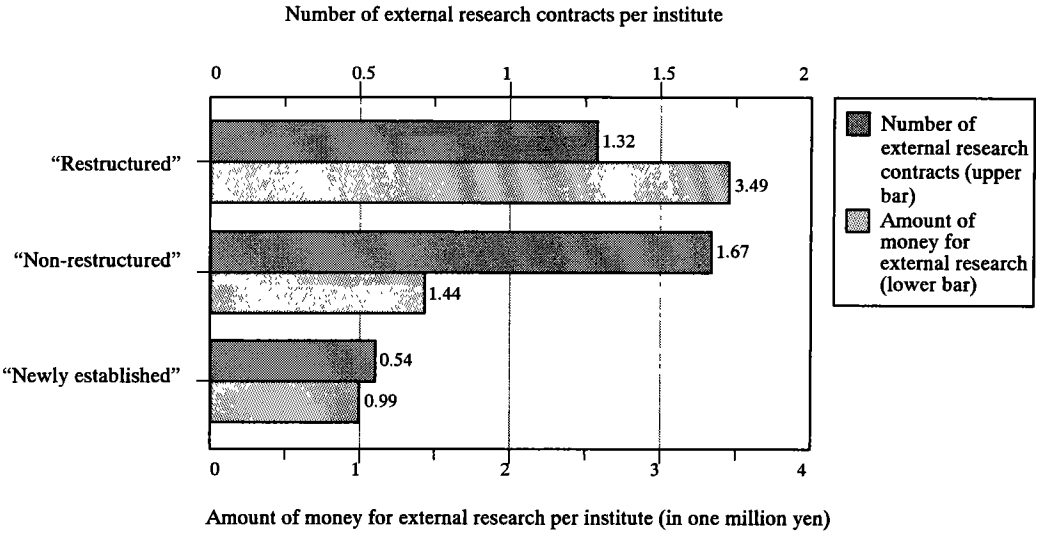
Fig. 4-3-5 Comparison between "restructured" and "non-restructured" — Education structure



5) External research contracts

As for external research contracts in reference to the number of contracts and the amount of money per institute, "non-restructured" was larger than "restructured" in the number of contracts, but "restructured" was far larger than "non-restructured" in the amount of money (Fig. 4-3-6).

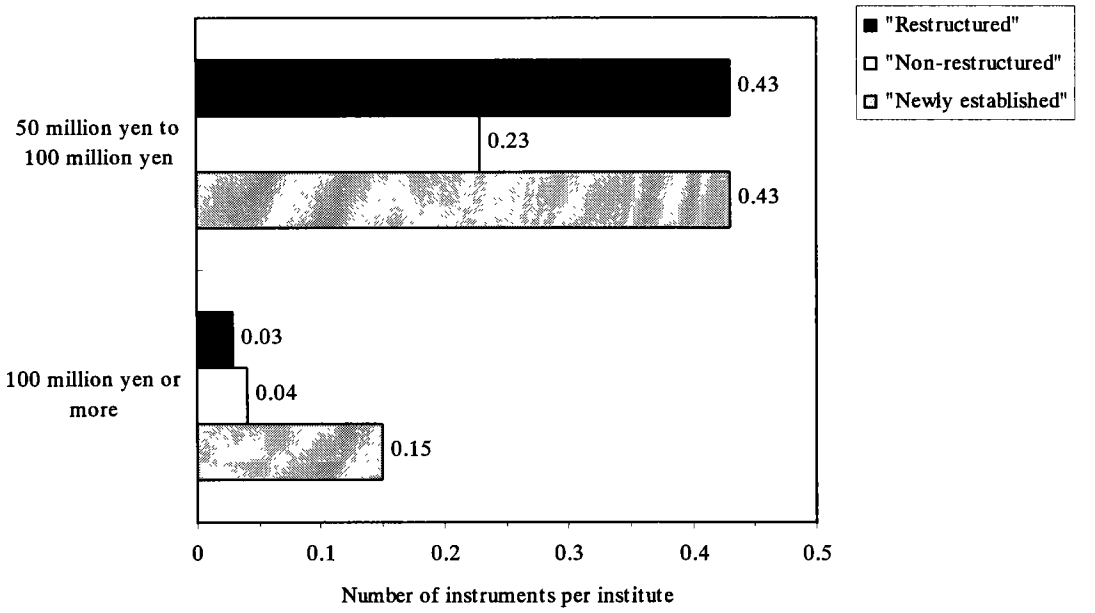
Fig. 4-3-6 Comparison between "restructured" and "non-restructured" of regional research institutes — Numbers of external research contracts and amounts of money per institute



6) Installation of expensive instruments

To compare the installation of expensive instruments in reference to the number of instruments per institute, in both the acquisition price brackets of 50 million yen to 100 million yen and 100 million yen or more, "restructured" group had more instruments installed than "non-restructured" group (Fig. 4-3-7).

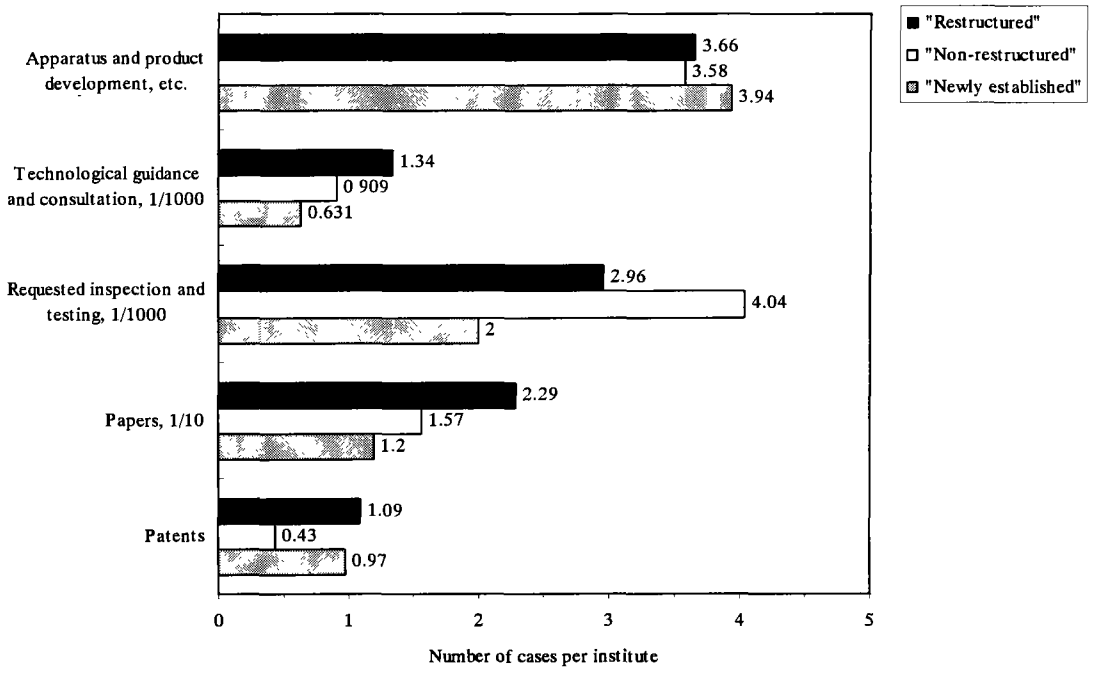
Fig. 4-3-7 Comparison between "restructured" and "non-restructured" of regional research institutes — Installation of expensive instruments



7) Activity results and research achievements

To compare activity results and research achievements in reference to the numbers of respective cases of "apparatus and product development, etc.", "technological guidance and consultation", "requested inspection and testing", "presentation of research papers at academic societies, etc." and "registrations of patents, new varieties, etc." (per institute), "non-restructured" was larger in "requested inspection" than "restructured", but in the other four items, "restructured" was larger than "non-restructured". Especially the differences in "papers" and "patents" were large (Fig. 4-3-8).

Fig. 4-3-8 Comparison between "restructured" and "non-restructured" of regional research institutes — Activity results and research achievements

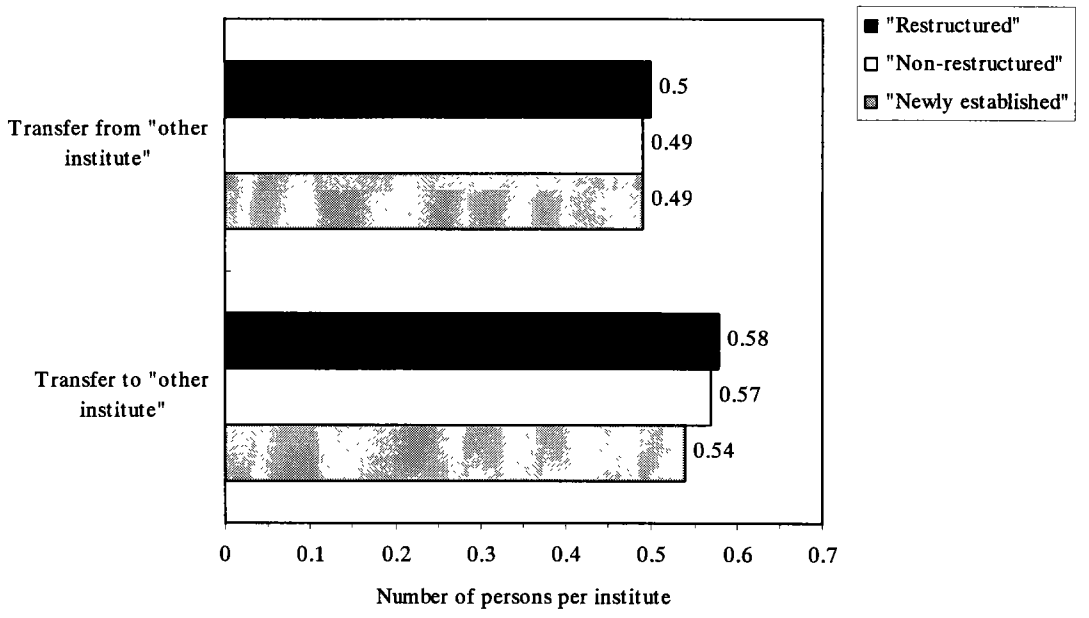


Note: The numbers of cases of "technological guidance and consultation" and "requested inspection and testing" were divided by a factor of 1000 for graphical expression, and those of "papers", by a factor of 10.

8) Personnel exchange

To compared the degrees of personnel exchange with other institutes in reference to the numbers of researchers accepted and dispatched per institute, there were no remarkable differences (Fig. 4-3-9).

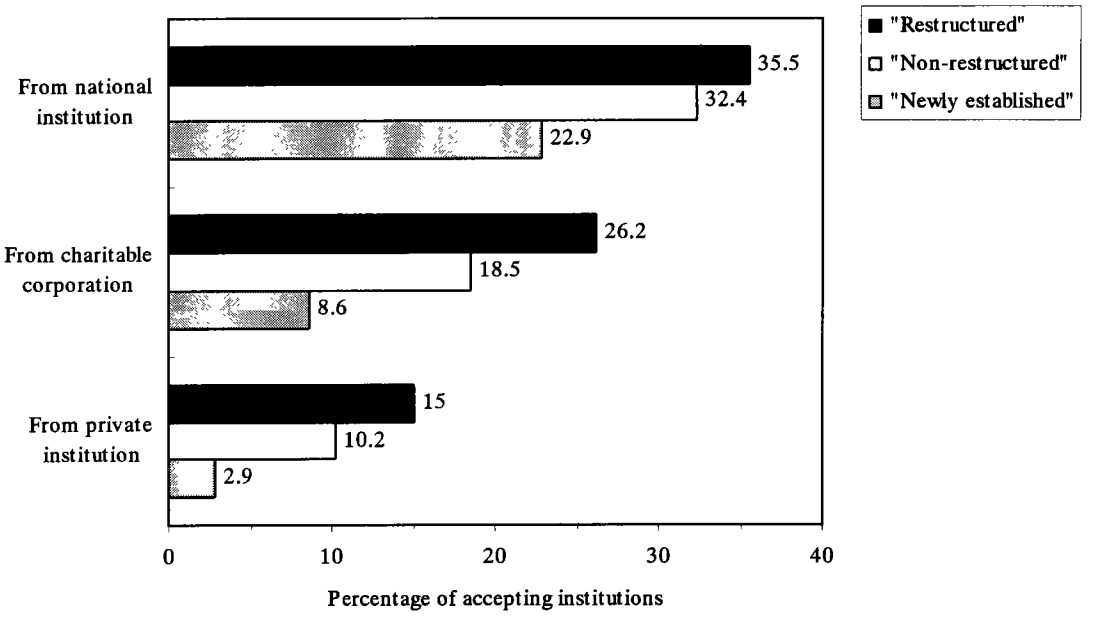
Fig. 4-3-9 Comparison between "restructured" and "non-restructured" of regional research institutes — Personnel exchange



9) Acceptance of research funds from outside

To compare the acceptance of research funds from outside in reference to the percentages of institutions accepting research funds from the three fund source institution categories, "restructured" is higher in the percentage of institutions than "non-restructured" in all the three fund source categories (Fig. 4-3-10).

Fig. 4-3-10 Comparison between "restructured" and "non-restructured" of regional research institutes — Acceptance of research funds from outside

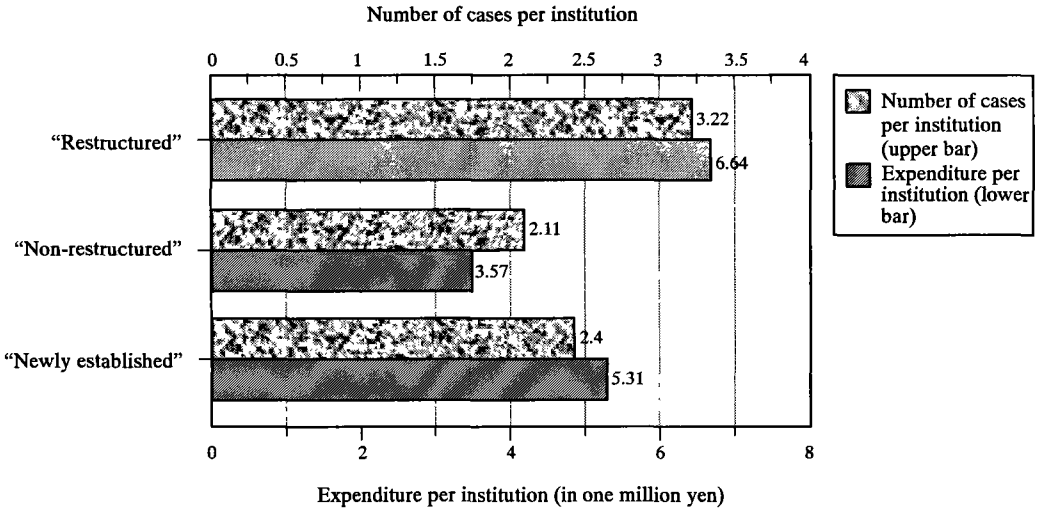


10) Joint research

To compare the numbers of joint research cases per institution, the number of cases of "restructured" was about 3, and that of "non-restructured", about 2, the former group being larger.

Also in the comparison of expenditure for joint research per institution, "restructure" was larger than "non-restructured" (Fig. 4-3-11).

Fig. 4-3-11 Comparison between "restructured" and "non-restructured" of regional research institutes — Joint research



CHAPTER 5 CONDITIONS OF RESEARCH INSTITUTIONS AND R&D SUPPORT INSTITUTIONS SUCH AS THIRD SECTORS AND JURIDICAL FOUNDATIONS

This chapter describes the conditions of R&D activities of research institutions and R&D institutions such as third sectors and juridical foundations based on the results of "Questionnairing concerning a survey on the effective utilization of regional resources in the regional promotion of science and technology".

5-1 Summary of surveyed institutions

(1) Surveyed institutions

From the results of the previous and present surveys conducted for prefectural governments, 175 institutions satisfying all the following conditions were surveyed.

1) An institution which carries out R&D activities or R&D support activities.
2) An institution, the establishment and management of which were participated in by any prefectural government through investment or research funds, etc.
3) An institution not directly managed by the prefectural government (not a so-called regional research institute)

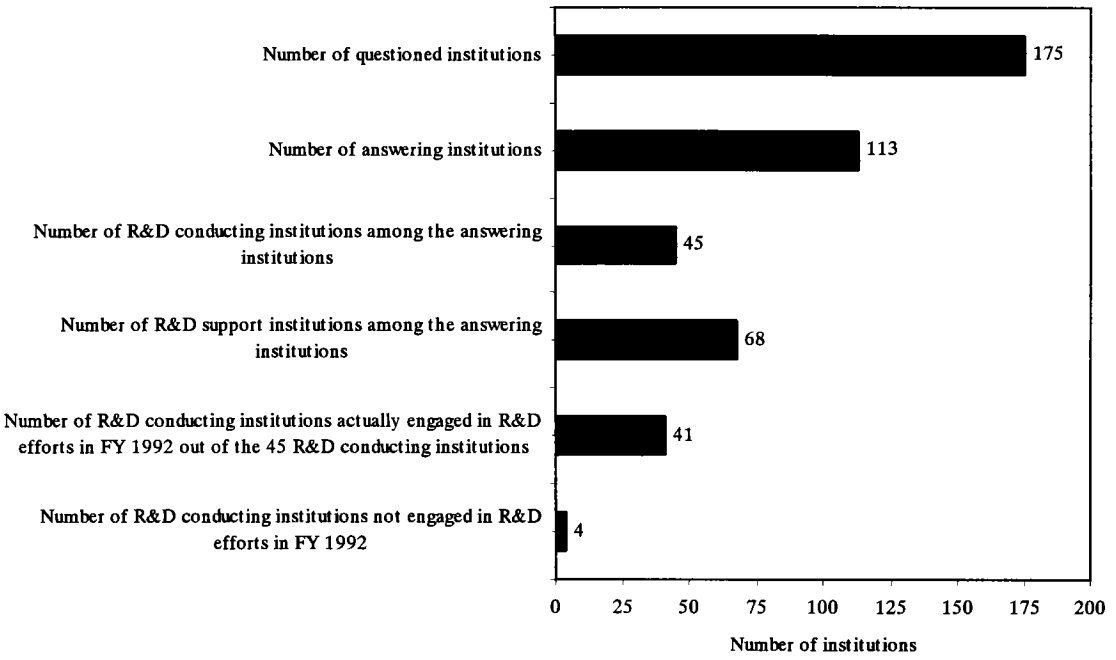
The number of R&D (support) institutions such as juridical foundations summarized in Chapter 3 was 166, and the number of institutions surveyed here was 175. As for the difference of 9 institutions, the respective component institutions in the following cases were surveyed independently to more accurately identify the conditions.

1) One research institution having research bases in plural prefectures (ex. "Underground Zero Gravity Experiment Center" of Hokkaido and "Japan Zero Gravity General Research Institute" of Gifu Prefecture)
2) An institution which could be divided into two institutions in charge of research activities and in charge of facility management respectively (ex. "Iwate Bioengineering Research Center" and "Iwate Bioengineering Research Institute")

(2) Surveyed institutions of this chapter

Of the 175 surveyed institutions, 113 institutions answered. Of them, 68 institutions did not conduct research, and so was considered as "R&D support institutions" and the remaining 45 institutions were considered as "R&D conducting institutions" which conducted R&D by themselves. The institutions covered in this chapter were 41 institutions who actually conducted R&D in FY 1992, out of the 45 "R&D conducting institutions" (Fig. 5-1-1).

Fig. 5-1-1 Number of institutions covered by "the survey for research institutions and R&D support institutions such as third sectors and juridical foundations"



Note: Of the 45 R&D conducting institutions, 3 institutions were established at the end of FY 1992, and 1 institution was planned to be established in FY 1995, respectively having not been engaged in any R&D efforts in FY 1992.

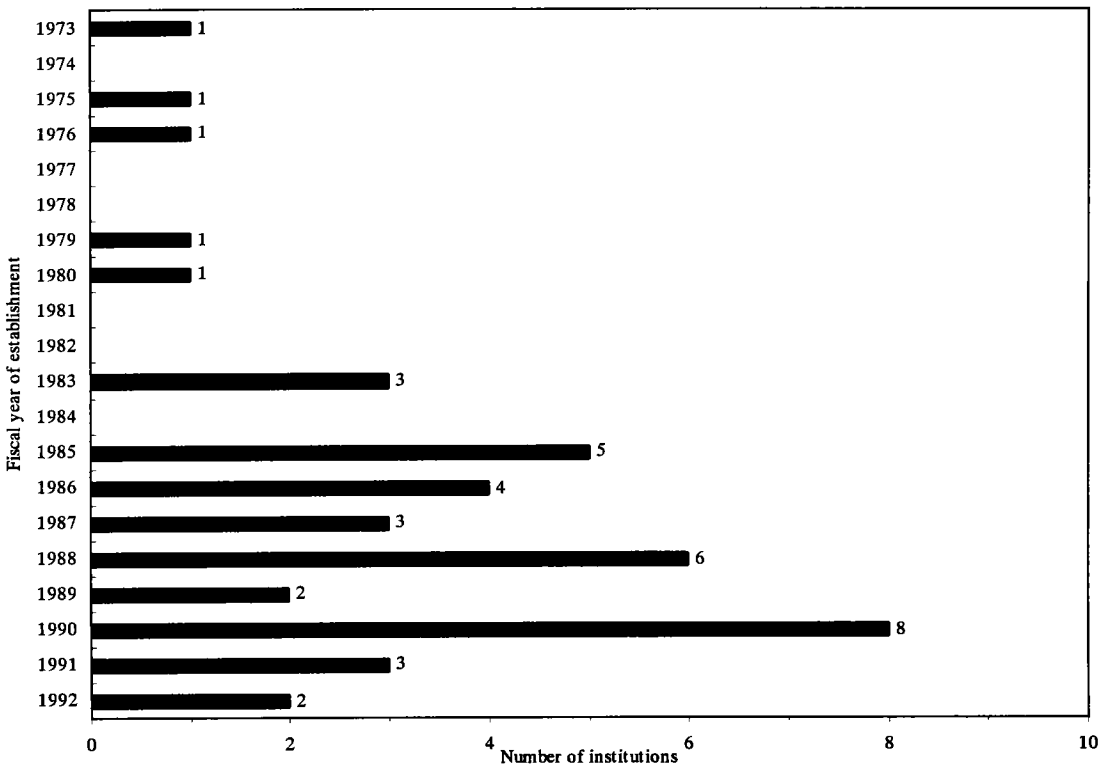
5-2 Survey results

(1) Outline of institutions

1) Fiscal years of establishment

Most of the institutions were established after FY 1983 when Technopolis Law was established (38 institutions out of 41 institutions). Also after FY 1990, the trend of new establishment continued (Fig. 5-2-1).

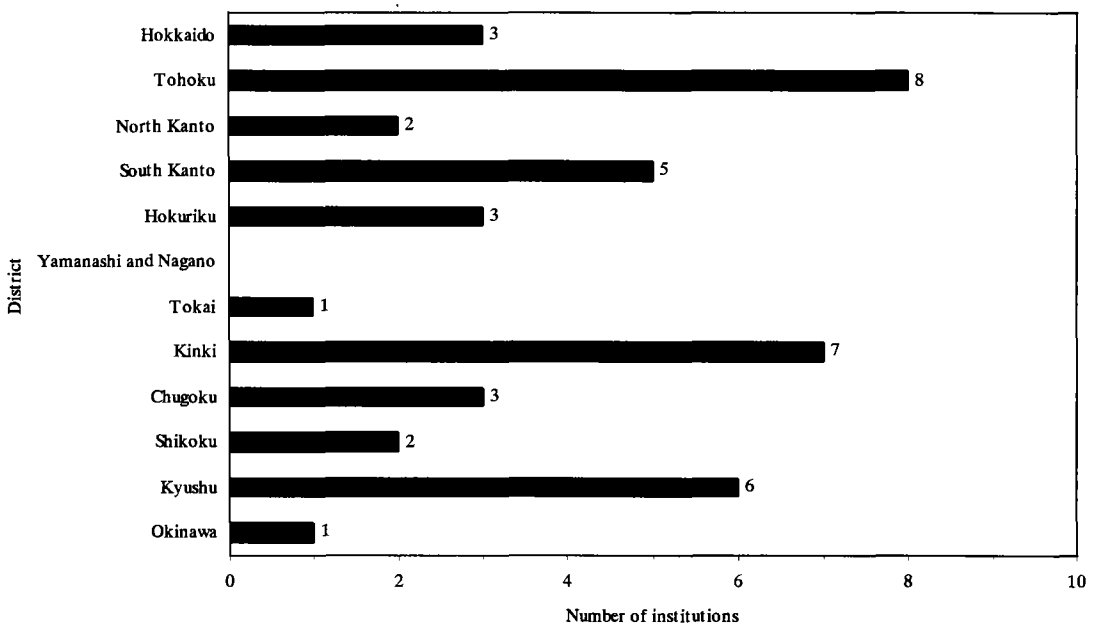
Fig. 5-2-1 Fiscal years of establishment of R&D conducting institutions "third sectors & foundations"



2) Regional distribution

The institutions were regionally widely distributed throughout Japan. Among them, Tohoku (8), Kinki (7), Kyushu (6), etc. were large in the number of institutions (Fig. 5-2-2).

Fig. 5-2-2 Regional distribution of R&D conducting institutions "third sectors & foundations"



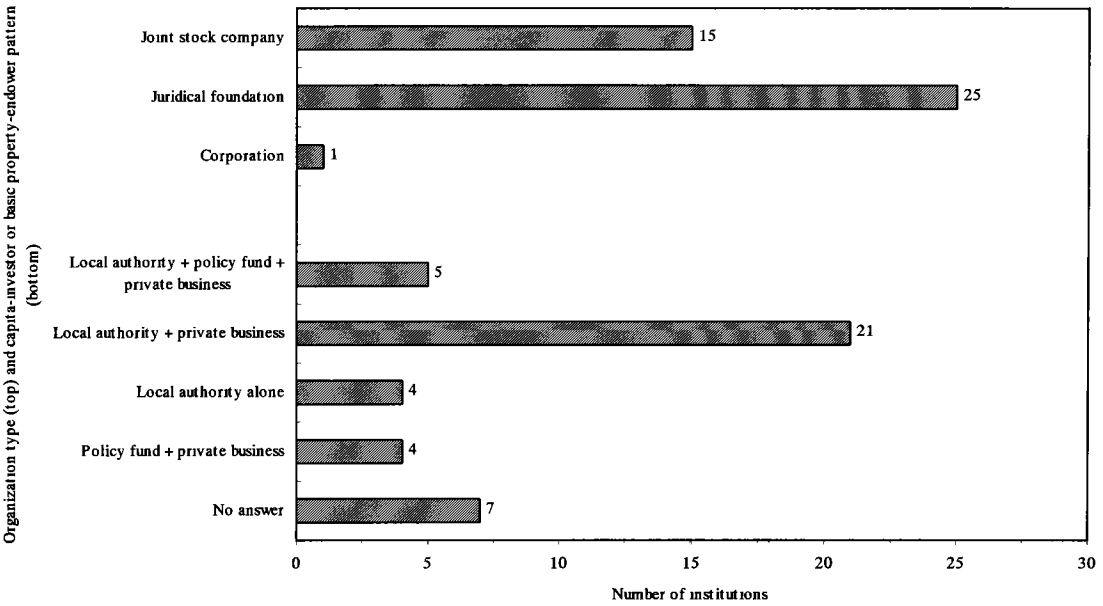
Note: Hokuriku = Niigata, Toyama, Ishikawa and Fukui
Tokai = Gifu, Shizuoka, Aichi and Mie
Kinki = Shiga, Kyoto, Osaka, Hyogo, Nara and Wakayama

3) Organization types and capital-investor or property-endower patterns

As for organization types, the number of joint stock companies was 15, that of juridical foundations, 25, and that of corporation, 1.

In reference to capital investor or basic property endower patterns, "local authority + private business" pattern was large in the number of institutions (Fig. 5-2-3).

Fig. 5-2-3 Organization types and capital-investor or basic property-endower patterns

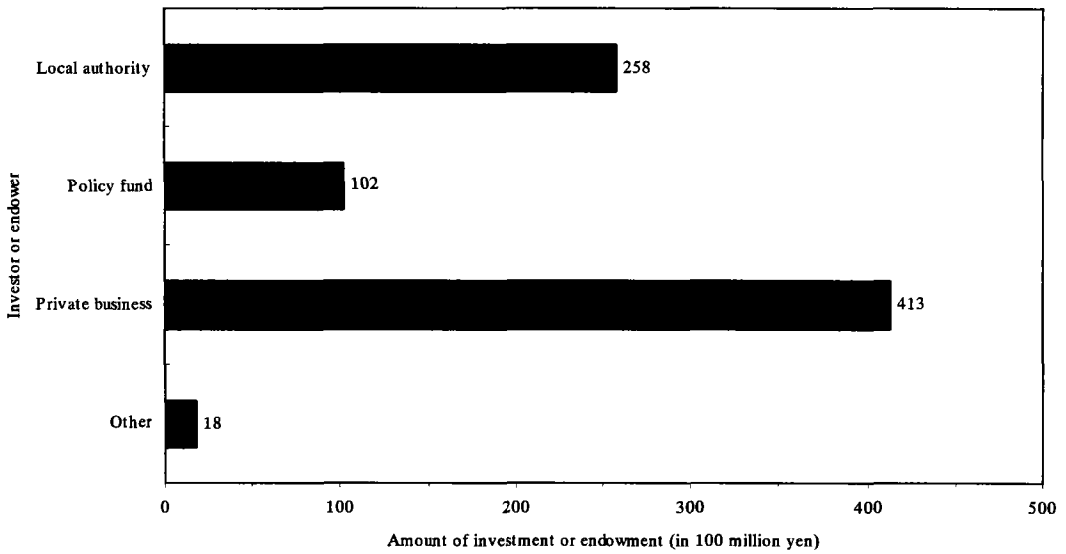


Note: The questionnaire items on the capital-investor or basic property-endower patterns included "local authority", "policy fund", "private business" and "other", but the "other" was disregarded here.

4) Inventors and endowers

As for the amounts of invested capitals or endowed basic properties (total amount 79,100 million yen, as total amount of 34 institutions which stated the amounts invested by respective investors or endowed by respective endowers) in reference to respective investors and endowers, the amount of funds from "private business" was the largest 41,300 million yen (52%), being followed by 25,800 million yen (33%) of "local authority". The amount of "policy fund" was 10,200 million yen, accounting for 13% (Fig. 5-2-4).

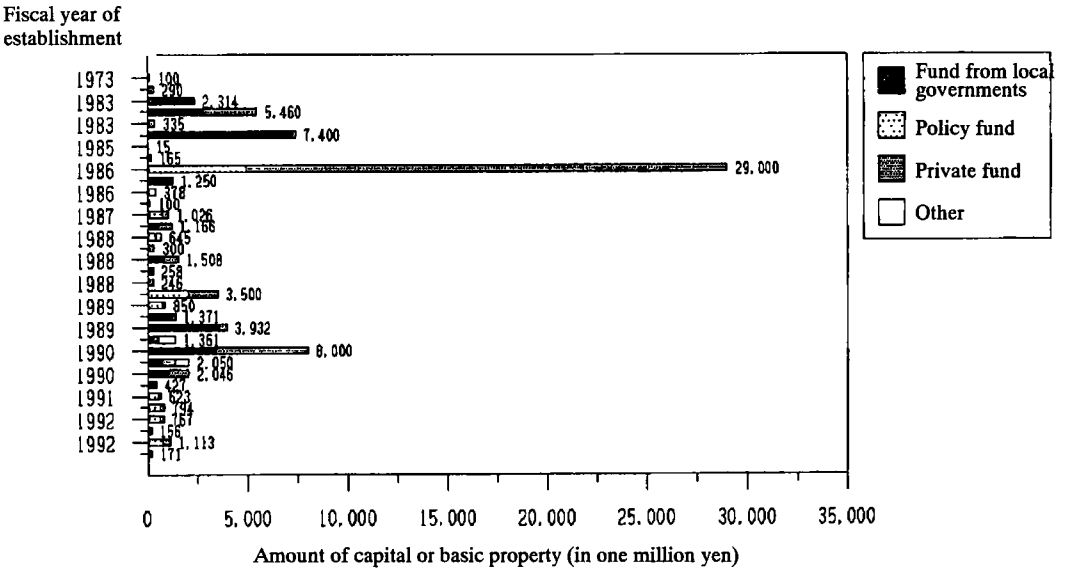
Fig. 5-2-4 Amounts of invested capitals or endowed basic properties of R&D conducting institutions "third sectors & foundations" by investor or endower



Note: The above values are of 34 institutions which stated the amounts invested by respective investors or endowed by respective endowers, among 41 R&D conducting institutions "third sectors & foundations".

The capital-investor or basic property-endower patterns of all the 34 institutions which stated the amounts invested by respective investors or endowed by respective endowers are shown below in the order of years of establishment. It can be seen that compared to the institutions established in FY 1988 to 1990, those established in FY 1991 and 1992 were lower in the percentage of "private fund" (Fig. 5-2-5).

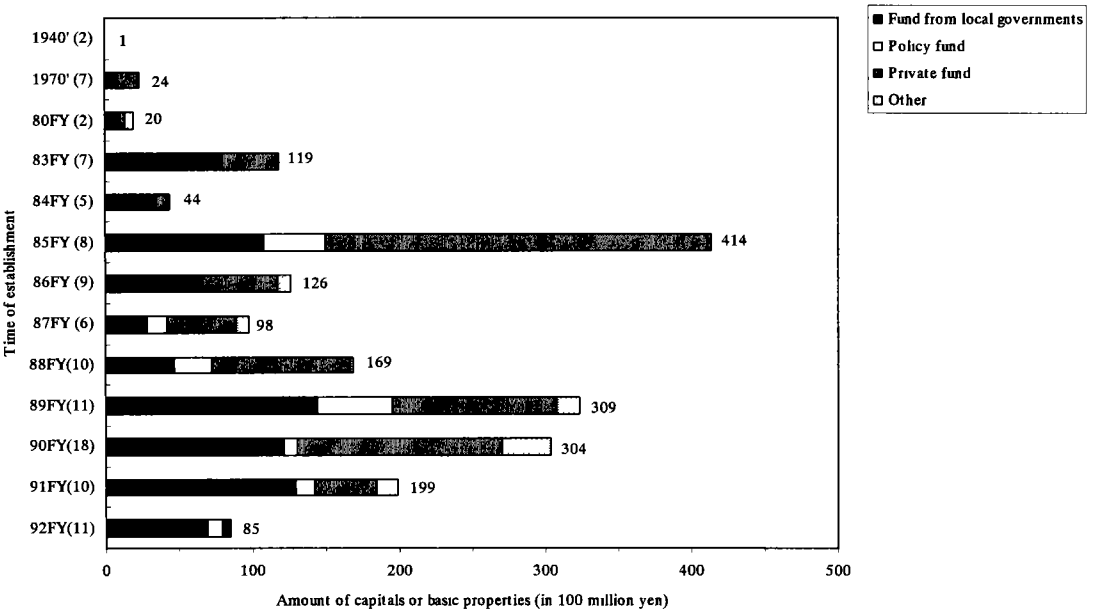
Fig. 5-2-5 Capital-investor or basic property-endower patterns of R&D conducting institutions "third sectors & foundations" in the order of years of establishment



Note: The above are of 34 institutions which stated the amounts invested by respective investors or endowed by respective endowers, among 41 R&D conducting institutions.

The capital-investor or basic property-endower patterns of the R&D conducting institutions plus the other answering institutions not conducting R&D totalized for respective fiscal years of established are shown below. It can be seen that the third sectors, juridical foundations, etc. established in FY 1987 to 1990 had a majority (or almost one half) of their capitals or basic properties obtained from "private fund", but that the third sectors, juridical foundations, etc. established in FY 1991 to 1992 had their capitals or basic properties mainly obtained from "local governments", and less from "private fund" (Fig. 5-2-6).

Fig. 5-2-6 Capita-investor or basic property-endower patterns of R&D conducting institutions and R&D support institutions "third sectors & foundations" in respective times of establishment

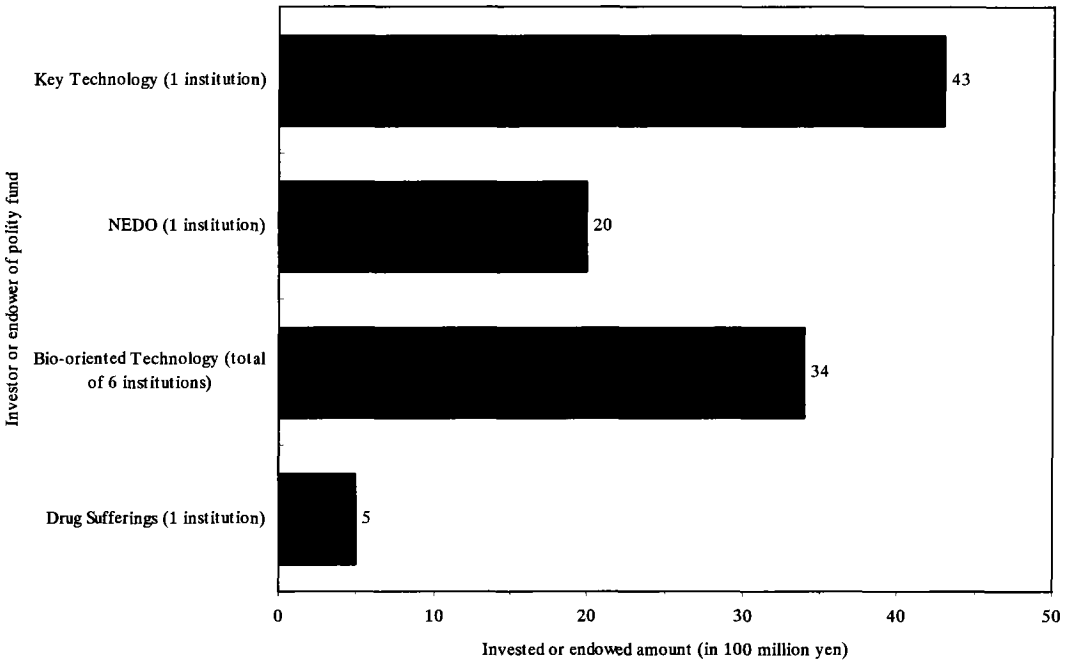


Note: The parenthesized numeral stated on the right of each time of establishment is the number of institutions established during the time concerned.

5) Policy funds

With regard to the 9 institutions which had their capitals or basic properties obtained from policy funds, 1 institution obtained 4,300 million yen from The Japan Key Technology Center, 1 institution, 2,000 million yen from New Energy and Industrial Technology Development Organization (NEDO), 6 institutions, 3,400 million yen in total from Bio-oriented Technology Research Advancement Institution, and 1 institution, 500 million yen from The Adverse Drug Sufferings Relief and Research Promotion Fund (Fig. 5-2-7).

Fig. 5-2-7 Breakdown of policy funds for R&D conducting institutions "third sectors & foundations"



Note: Amounts of investment or endowment of 9 institutions having policy fund in the capital-investor or basic property-endower pattern.

6) Owning and borrowing patterns of building and research equipment

The owning and borrowing of building and research equipment were classified into 16 patterns, and the institutions were classified into the respectively applicable patterns. Of the 16 patterns, 8 patterns had institutions belonging to the respective patterns, to show that the institutions were diverse in the building and research equipment owning and borrowing patterns. The number of institutions falling under "building owning + research equipment owning" was the largest 17, being followed by respectively 7 institutions of "building borrowing + research equipment owning" and "building borrowing + research equipment borrowing" (Table 5-2-1).

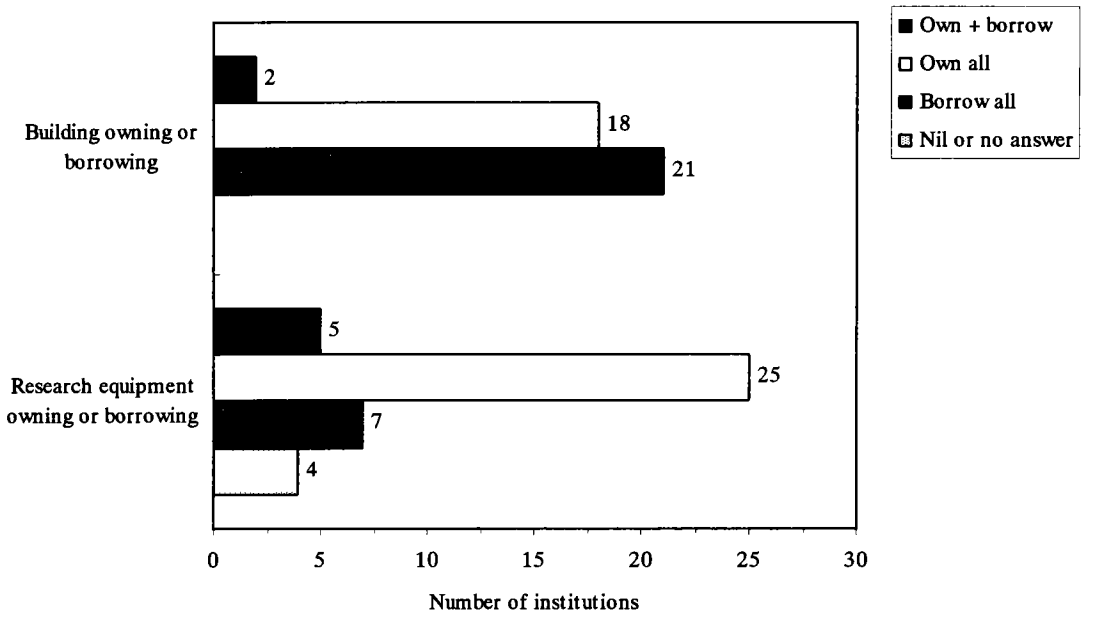
Table 5-2-1 Owning and borrowing patterns of building and research equipment of R&D conducting institutions "third sectors & foundations"

Pattern #	Building		Research equipment		Number of institutions concerned
	Owning	Borrowing	Owning	Borrowing	
1	○	○	○	○	1
2	○	○	○	×	1
3	○	○	×	○	0
4	○	○	×	×	0
5	○	×	○	○	0
6	○	×	○	×	17
7	○	×	×	○	0
8	○	×	×	×	1
9	×	○	○	○	4
10	×	○	○	×	7
11	×	○	×	○	7
12	×	○	×	×	3
13	×	×	○	○	0
14	×	×	○	×	0
15	×	×	×	○	0
16	×	×	×	×	0
Total					41

7) Owning and borrowing rates of building and research equipment

With regard to the owning and borrowing rates of buildings and research equipment, most of the institutions "borrow all" or "own all" the building, and those institutions accounted for almost one half respectively. The number of institutions which "own all" research equipment was as large as 25 (Fig. 5-2-8).

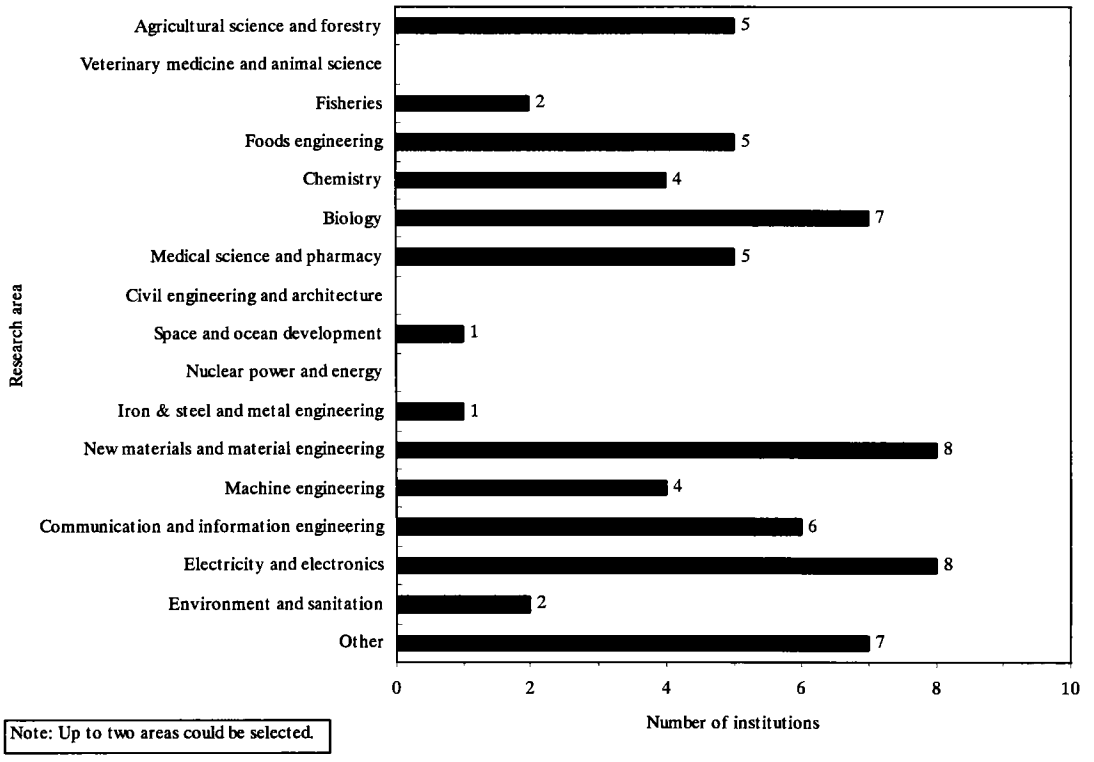
Fig. 5-2-8 Owning and borrowing rates of building and research building of R&D conducting institutions "third sectors & foundations"



8) Major research areas

Seventeen major research areas were presented to be selected (up to two areas). As a result, the numbers of institutions in the areas of "new materials and material engineering", "electricity and electronics" and "bioengineering" were large, being followed by those in the areas of "communication and information engineering", "agricultural science and forestry", "foods engineering" and "medical science and pharmacy" (Fig. 5-2-9).

Fig. 5-2-9 Major research areas of R&D conducting institutions



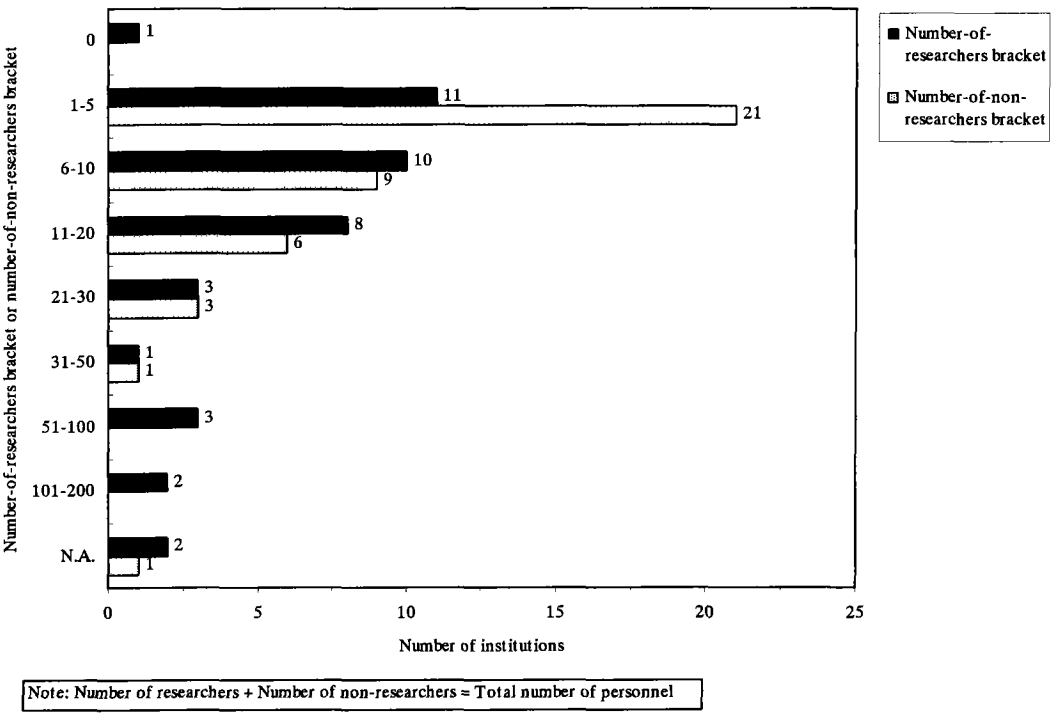
Note: Up to two areas could be selected.

(2) Researchers

1) Number of researchers and number of personnel (non-researchers)

The numbers of researchers and the numbers of personnel other than researchers were arranged in reference to respective number brackets. The number of institutions having 10 or less researchers was 22, accounting for one half. The number of institutions having 5 or less personnel other than researchers was 21, accounting for one half (Fig. 5-2-10).

Fig. 5-2-10 Numbers of researchers and number of non-researchers in R&D conducting institutions "third sectors & foundations"

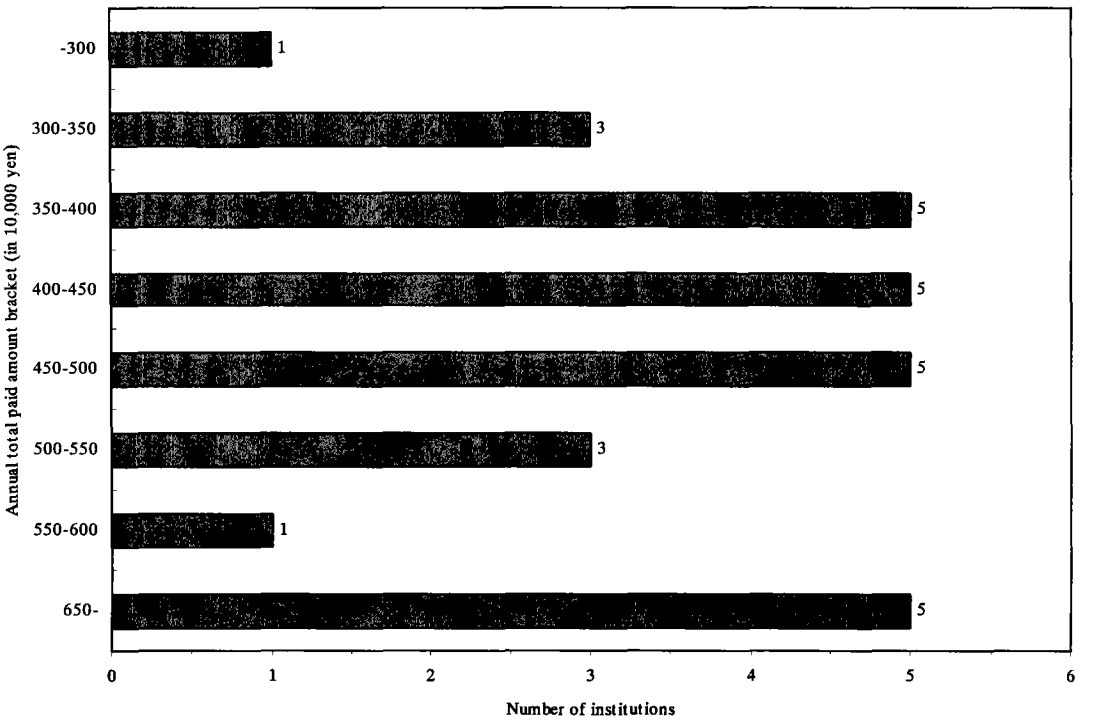


Note: Number of researchers + Number of non-researchers = Total number of personnel

2) Salary levels

As for the salary levels, the average annual total amounts of salaries paid to researchers of about 30 years old (including various allowances) were asked in reference to respective total paid amount brackets. It is notable that the largest number of institutions (5) fell under "3.5 million yen to 4.0 million yen", "4.0 million yen to 4.5 million yen" and "4.5 million yen to 5.0 million yen" brackets respectively, and that the same number of institutions (5) also fell under the "6.5 million yen or more" bracket (Fig. 5-2-11).

Fig. 5-2-11 Annual average total amounts of salaries paid to researchers of about 30 years old in R&D conducting institutions "third sectors & foundations"



3) Researcher status patterns

Sixteen researcher status patterns were established in reference to whether they were regularly employed, loaned, etc., and the institutions were classified into the respectively belonging patterns. Of the 16 patterns, 11 patterns had institutions belonging to the patterns, to show that the researcher status patterns were diverse. Among the patterns, the numbers of institutions falling under "non-paid loan researchers alone" (7), "regularly employed researchers (tenured) + paid loan researchers" (6) and "paid loan researchers alone" (5) were relatively large (Table 5-2-2)

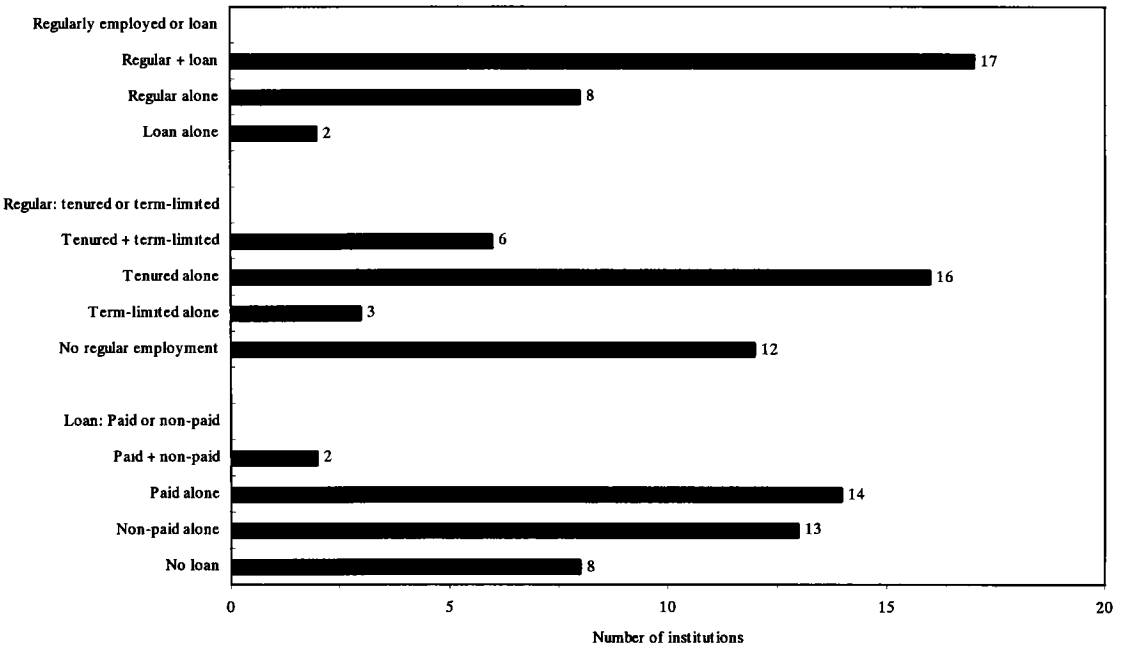
Table 5-2-2 Researcher status patterns of R&D conducting institutions "third sectors & foundations"

Pattern #	Regularly employed researchers (tenured)	Regularly employed researchers (term-limited)	Paid loan researchers	Non-paid loan researchers	Number of institutions concerned
1	○	○	○	○	0
2	○	○	○	×	1
3	○	○	×	○	2
4	○	○	×	×	3
5	○	×	○	○	2
6	○	×	○	×	6
7	○	×	×	○	4
8	○	×	×	×	4
9	×	○	○	○	0
10	×	○	○	×	2
11	×	○	×	○	0
12	×	○	×	×	1
13	×	×	○	○	0
14	×	×	○	×	5
15	×	×	×	○	7
16	×	×	×	×	0
No answer					4
Total					41

4) More detailed researcher status patterns

The institutions were classified into more detailed researcher status patterns. As for regularly employed researchers and loan researchers, the number of institutions falling under "regular + loan" pattern was largest (17 institutions). As for regularly employed researchers tenured and term-limited, the number of institutions falling under "regularly employed tenured researchers alone" pattern was largest (16 institutions). As for loan researchers, the numbers of institutions falling under "paid alone" and "non-paid alone" were large, but the number of institutions falling under "paid + non-paid" was small (Fig. 5-2-12).

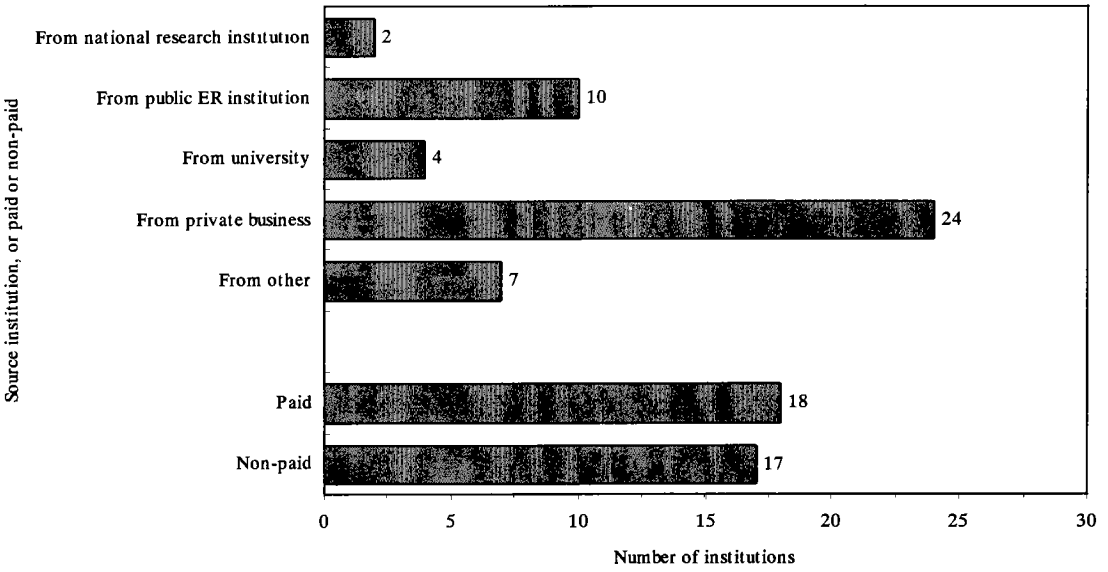
Fig. 5-2-12 Numbers of institutions classified into more detailed researcher status patterns, of R&D conducting institutions "third sectors & foundations"



5) Numbers of institutions having loan researchers by source institution

As for the numbers of institutions having loan researchers by source institution, the number of institutions having loan researchers from "private business" was the largest 24, being following by 10 institutions having loan researchers from "local public experiment and research institutions" (Fig. 5-2-13).

Fig. 5-2-13 Numbers of institutions having loan researchers by source institution, and numbers of institutions having paid loan researchers and non-paid loan researchers, of R&D conducting institutions "third sectors & foundations"

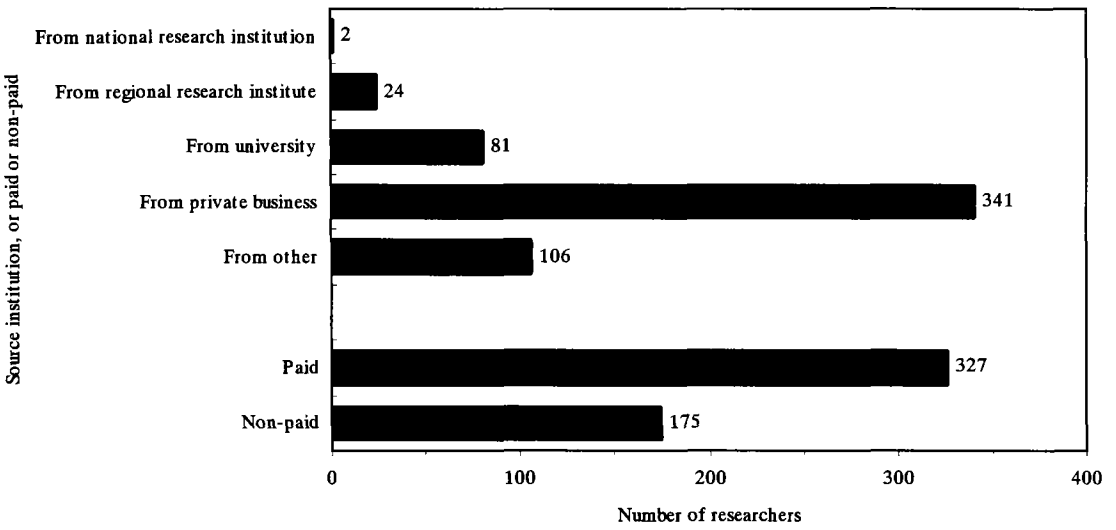


Note: Of the 41 R&D conducting institutions, 30 institutions had researchers loaned from outside. "Paid" or "non-paid" means that the loan researchers were paid or non-paid at the institutions where they were actually working.

6) Numbers of loan researchers by source institution

With regard to the numbers of loan researchers by source institution, the number of loan researchers "from private business" was the largest 341, being followed by 81 "from university". Many of 106 researchers "from other" were "working also in hospital" and "guest researchers" (Fig. 5-2-14).

Fig. 5-2-14 Numbers of loan researchers by source institution, and numbers of paid and non-paid researchers, of R&D conducting institutions "third sectors & foundations"

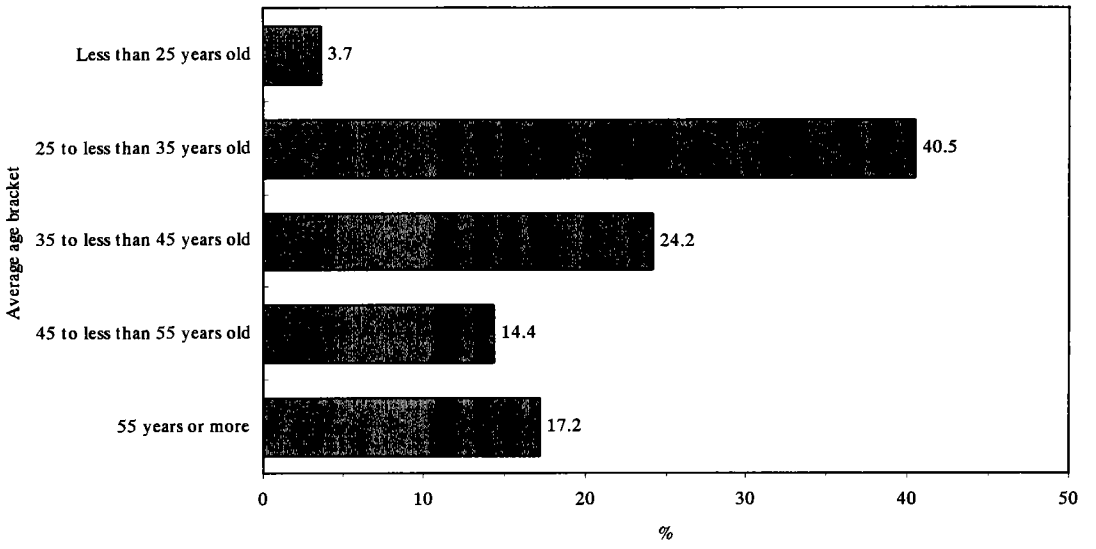


Note: Of the 41 R&D conducting institutions, 30 institutions had researchers loaned from outside. "Paid" or "non-paid" means that the loan researchers were paid or non-paid at the institutions where they were actually working.

7) Age structure of researchers

With regard to the age structure of researchers (FY 1992) (by simply averaging the age bracket percentages of respective 41 R&D conducting institutions), the "25 to less than 35 years old" bracket accounted for the largest 40.5% (Fig. 5-2-15).

Fig. 5-2-15 Age structure of researchers in R&D conducting institutions "third sectors & foundations"

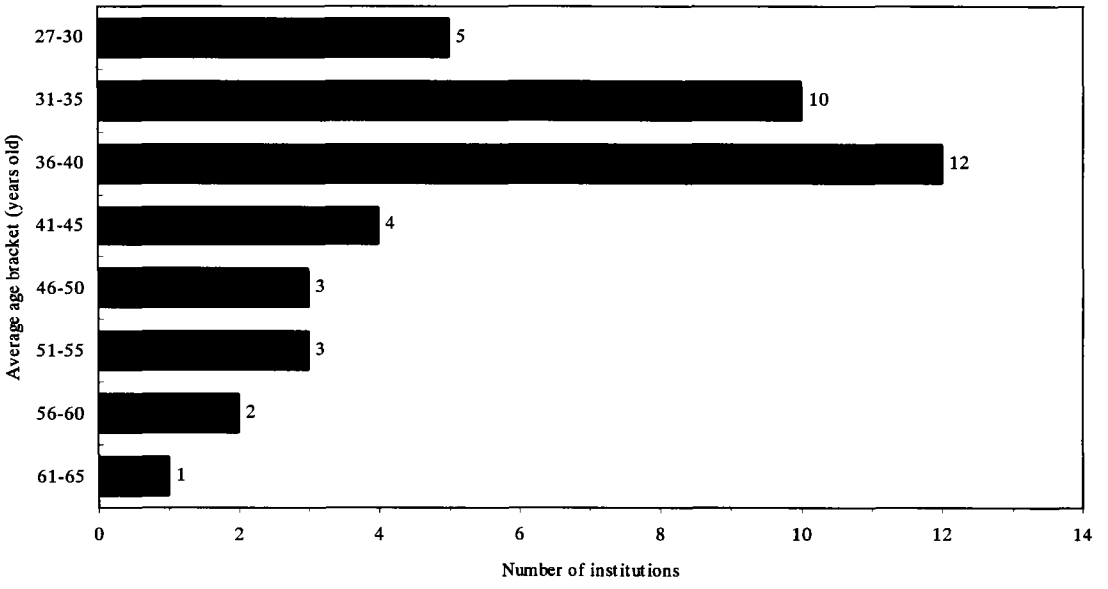


Note: Obtained by simply averaging the age bracket percentages of researchers in the respective 41 R&D conducting institutions.

8) Average ages of researchers

To see the average ages of researchers of respective institutions (FY 1992) in reference to the numbers of institutions by age bracket, the number of institutions in the "36 to less than 40 years old" bracket was the largest 12, and the total of the numbers of institutions in the three brackets of less than 40 years old was 27, out of 41 institutions (Fig. 5-2-16).

Fig. 5-2-16 Average ages of researchers in R&D conducting institutions "third sectors & foundations"



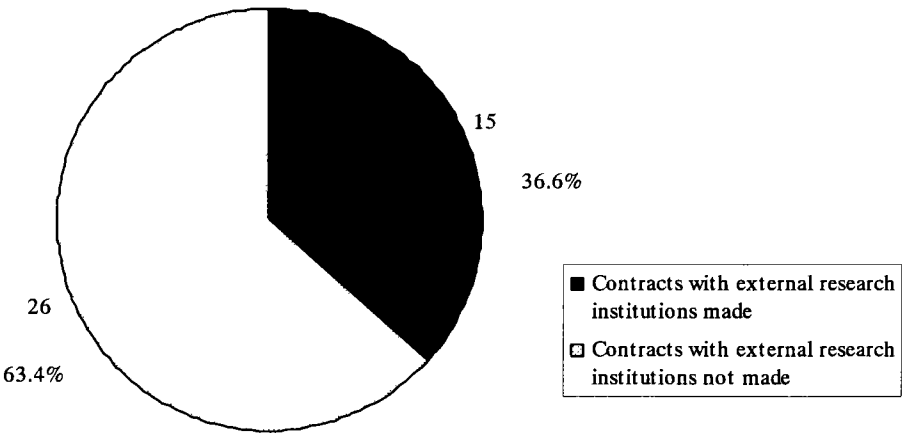
Note: The simple average of the average ages was 39.5 years old.

(3) External research contracts

1) Whether or not contracts were made with external research institutions

The 41 R&D conducting institutions analyzed in this chapter were those who conducted R&D by themselves, and it was investigated whether or not they also made "external research contracts" (FY 1992). Fifteen institutions were found to have made such contracts (Fig. 5-2-17). The total number of external research contracts of the 15 institutions was 73, and the total expenditure was about 1,300 million yen.

Fig. 5-2-17 Whether or not the R&D conducting institutions "third sectors & foundations" made contracts with external research institutions

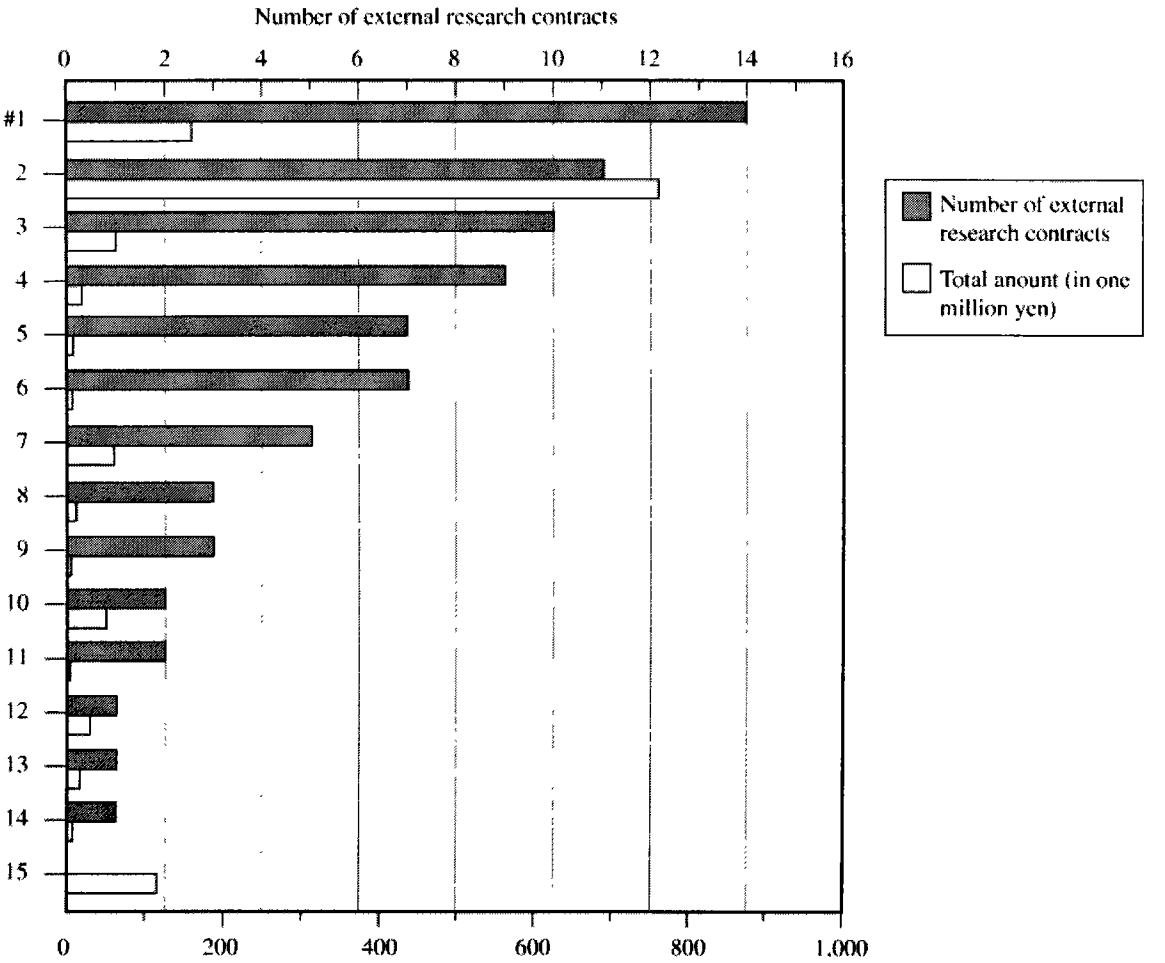


Note: Contracts with external research institutions made = Organization's own research efforts + external research
Contracts with external research institutions not made = Organization's own research efforts alone

2) Numbers and total amounts of expenditure of external research contracts made by the respective R&D conducting institutions

According to the numbers and total amounts of expenditure of external research contracts made by the respective 15 R&D conducting institutions, most institutions (11 out of 15) conducted plural cases (14 to 2) of joint research (Fig. 5-2-18).

Fig. 5-2-18 Numbers and total amounts of expenditure of external research contracts of the institutions which made external research contracts, among the R&D conducting institutions "third sectors & foundations"



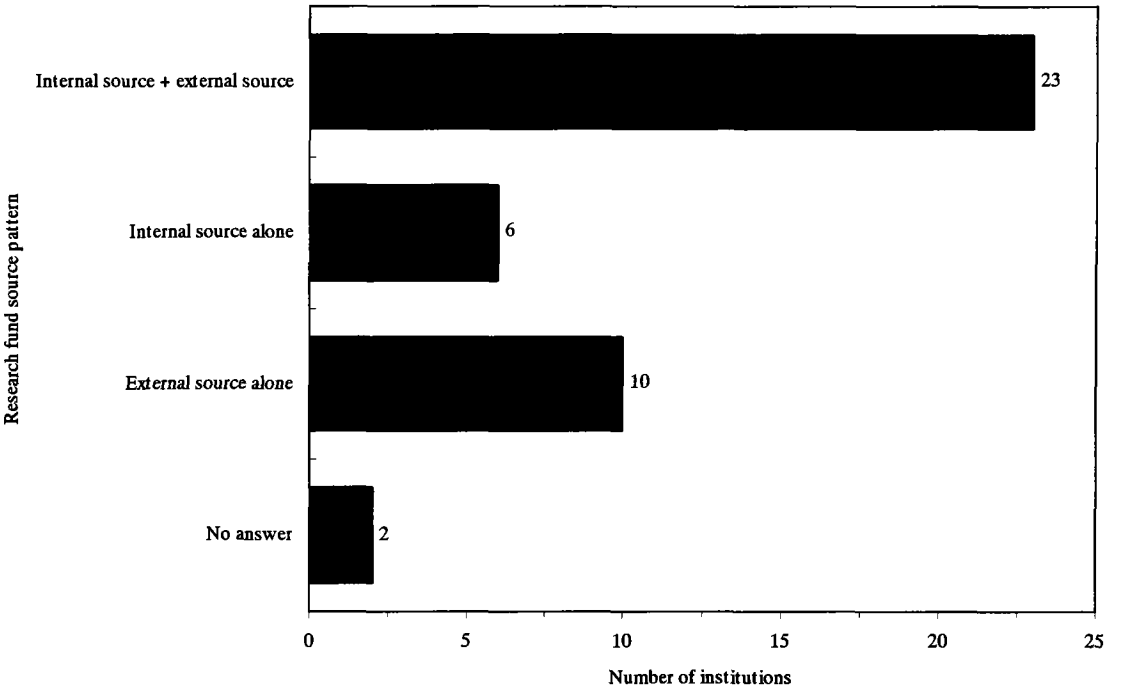
Note: Total number of external research contracts •••73
Total amount of expenditure•••1,300 million yen

(4) Research funds

1) Research fund source patterns

In the research source patterns based on internal and external sources of FY 1992, "internal source + external source" pattern was adopted most by 23 institutions, being followed by 10 institutions of "external source alone" and 6 institutions of "internal source alone" (Fig. 5-2-19).

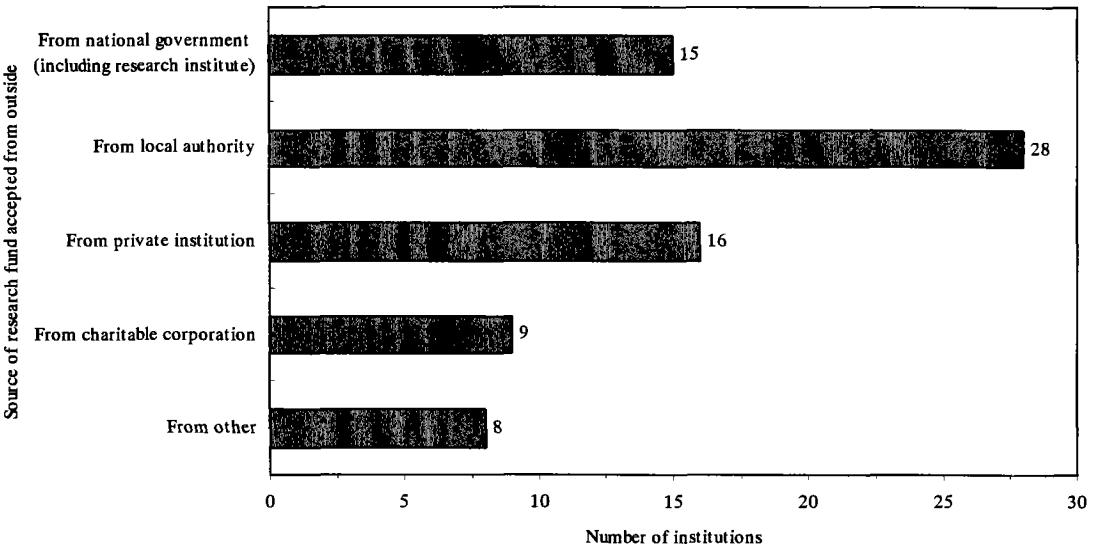
Fig. 5-2-19 Research fund source patterns of R&D conducting institutions "third sectors & foundations"



2) Numbers of institutions accepting external research funds by fund source

According to the numbers of institutions accepting external research funds by fund source, the number of institutions accepting funds "from local authority" was largest (28 institutions), being followed by "from private institution" (16 institutions) and "from national government (including national research institution)" (15 institutions) (Fig. 5-2-20).

Fig. 5-2-20 Numbers of R&D conducting institutions "third sectors & foundations" accepting external research funds by fund source

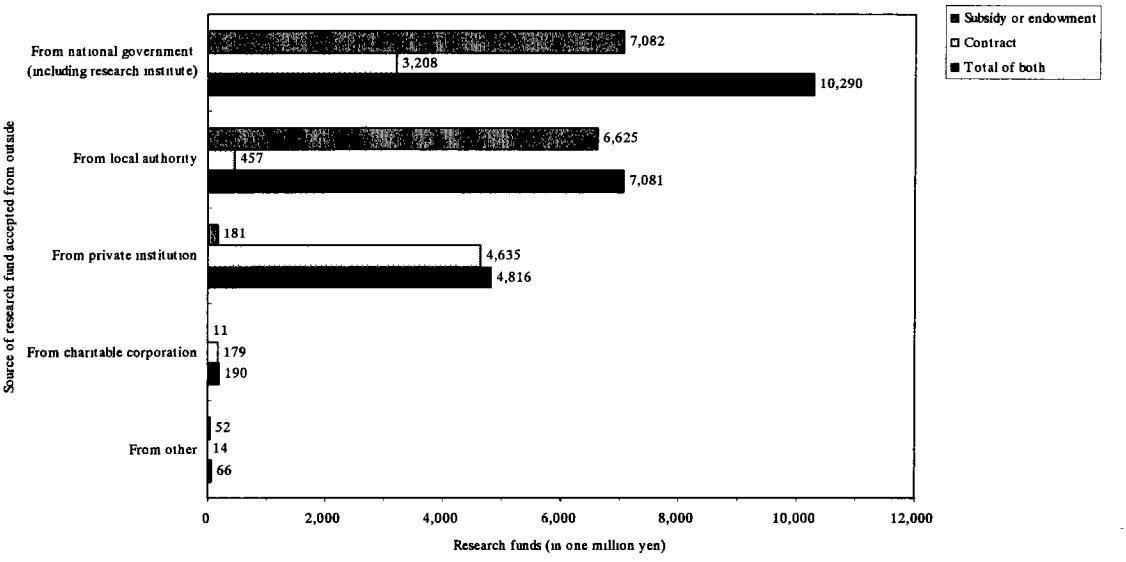


Note: Data of 33 institutions accepting external funds by fund source, among the 41 R&D conducting institutions

4) Amounts of research funds accepted from outside, by fund source

When the research funds accepted from outside by fund source were classified into "subsidy or endowment", "contract" and "total of both", the "total of both" the subsidy or endowment and the contract "from national government" was largest, being followed by that "from local authority" and that "from private institution" in this order. As for the breakdown, in the amounts "from national government" and "from local authority", the percentages of "subsidy or endowment" were large, and in the amount "from private institution", the percentage of "contract" was large (Fig. 5-2-21).

Fig. 5-2-21 Amounts of research funds accepted by the R&D conducting institutions "third sectors & foundations" from outside, by fund source

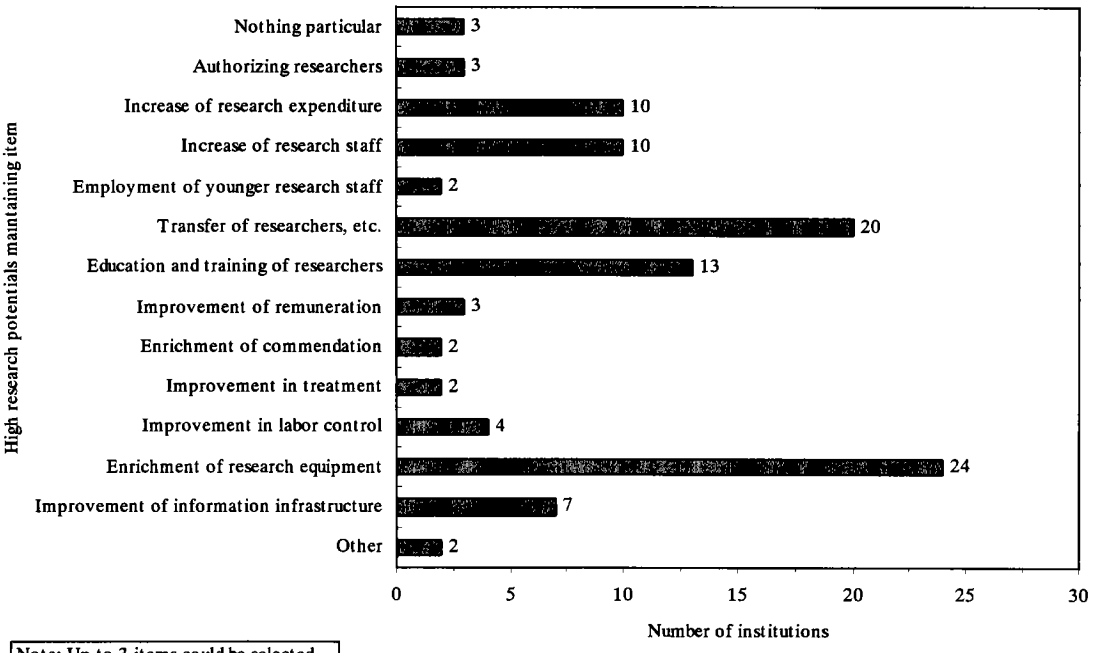


Note. Total amounts of research funds accepted by 33 institutions from outside, by fund source, among the 41 R&D conducting institutions

(4) Efforts for maintaining high research potentials

As for the efforts for maintaining high research potentials by the R&D institutions, many institutions made efforts of "enriching research equipment", " transfer of researchers" and "educating and training of researchers" (Fig. 5-2-22).

Fig. 5-2-22 Efforts by R&D conducting institutions "third sectors & foundations" for maintaining high research potentials

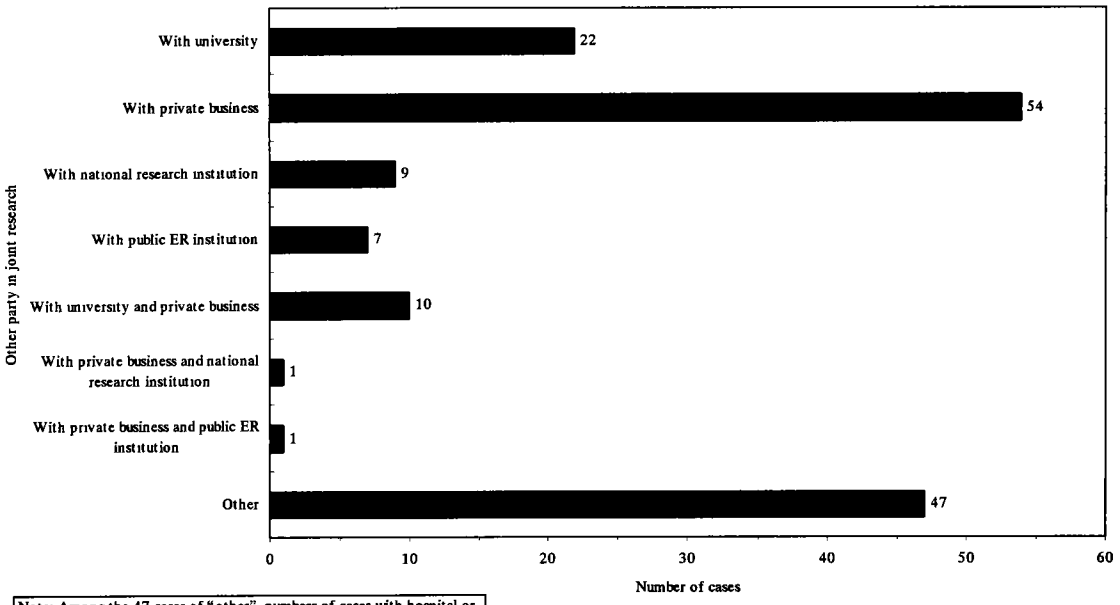


Note: Up to 3 items could be selected.

(5) Joint research

According to the number of joint research cases by party category of other party, the number of cases "with private business" was largest, accounting for about one third of all the 151 joint research cases, being following by that "with university" and that with "university and private business" (Fig. 5-2-23).

Fig. 5-2-23 Number of joint research cases of the R&D conducting institutions "third sectors & foundations" by party category



Note: Among the 47 cases of "other", numbers of cases with hospital or foreign research institution were large.

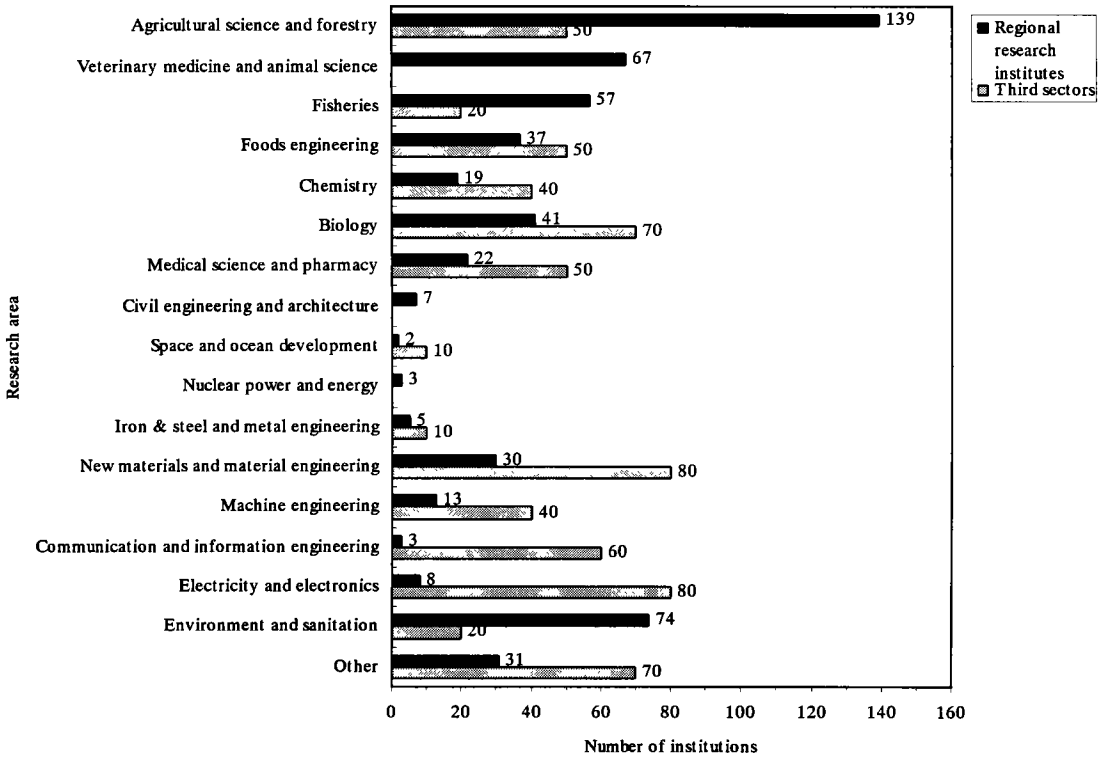
5-3 Comparison between Regional Research Institutions and Third Sectors & Juridical Foundations

The 450 answering regional research institutes and the 41 R&D conducting institutions (hereinafter called "third sectors & foundations") of the 113 answering third sectors & foundations are graphically compared below in staff, instruments, achievements, etc. relating to R&D activities.

(1) Major research areas

With regard to the major research areas (up to two areas could be selected), the numbers of regional research institutes were large in "agricultural science and forestry", "veterinary medicine and animal science", "fisheries" and "environment and sanitation", but the numbers of third sectors & foundations were large in "new materials and material engineering", "electricity and electronics" and "bioengineering" (Fig. 5-3-1).

Fig. 5-3-1 Comparison between regional research institutes and third sectors & foundations — Major research areas

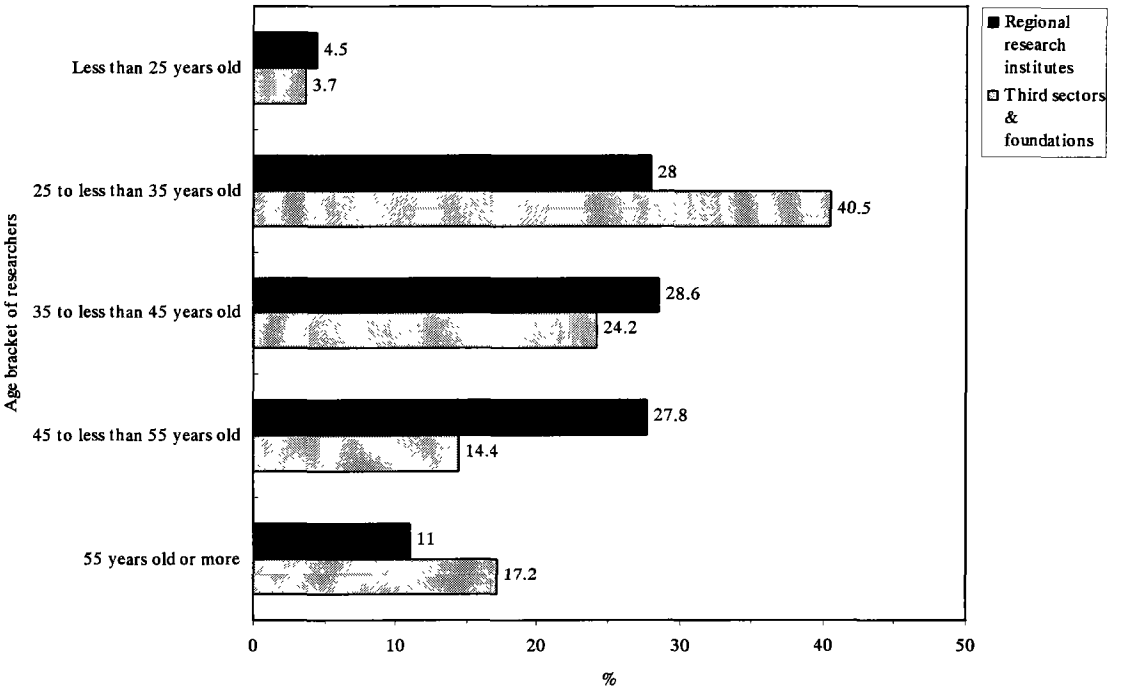


Note: For easier comparison on the graph, the numbers of "third sectors & foundations" were multiplied by a factor of 10 for graphical expression.

(2) Age structure

To compare the age structures of researchers in reference to the percentages obtained by simply averaging the percentages of researchers in respective age brackets obtained from the respective institutions, the regional research institutes showed about the same percentages in the three brackets of "25 to 35", "35 to 45" and "45 to 55", but the third sectors & foundations were especially large in the "25 to 35" bracket.

Fig. 5-3-2 Comparison between regional research institutes and third sectors & foundations — Age structure of researchers



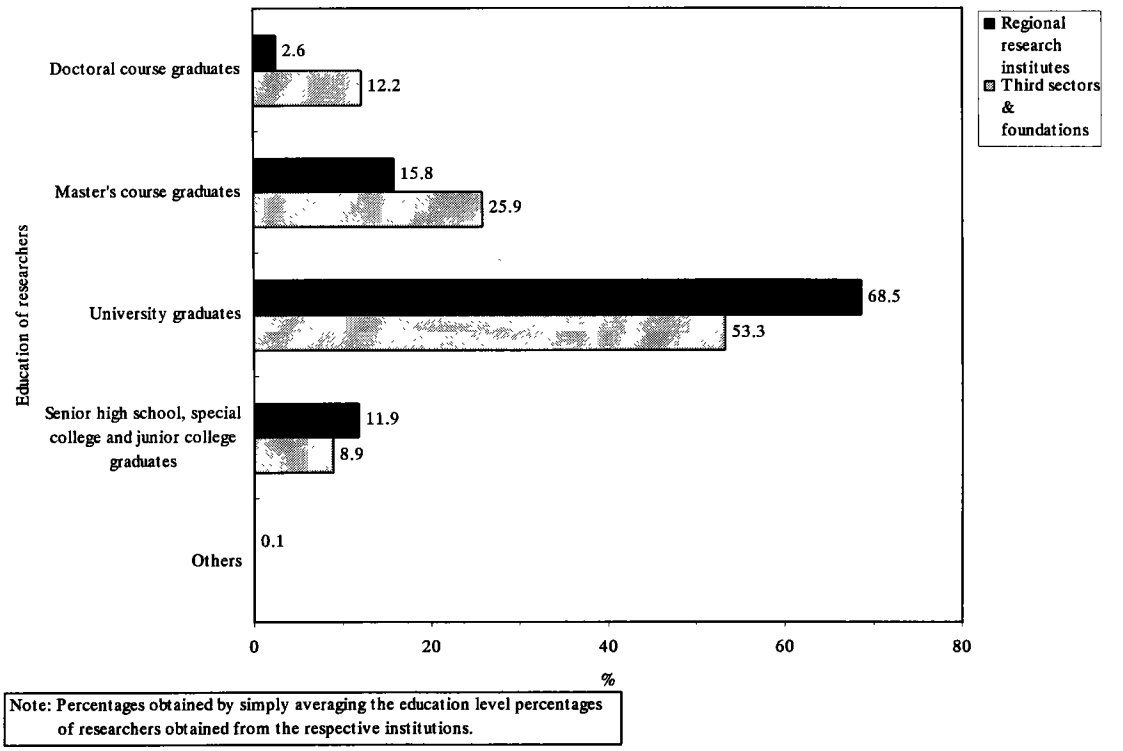
Note: Percentages obtained by simply averaging the percentages of researchers in the respective age brackets obtained from the respective institutions.

(3) Education structure

To compare the education structures of researchers in reference to the percentages obtained by simply averaging the education level percentages of researchers obtained from the respective institutions, in the regional research institutes, "university graduates" accounted for nearly 70% predominantly, but in the third sectors & foundations, "university graduates" accounted for 53%, "master's course graduates", 26%, and "doctor's course graduates", 12% (Fig. 5-3-3).

As for the numbers of doctors, the regional research institutes had 2.1 doctors per institution (400 answering institutions had 843 doctors), while the third sectors & foundations had 6.6 doctors per institution (38 answering institutions had 250 doctors).

Fig. 5-3-3 Comparison between regional research institutes and third sectors & foundations — Education structure of researchers

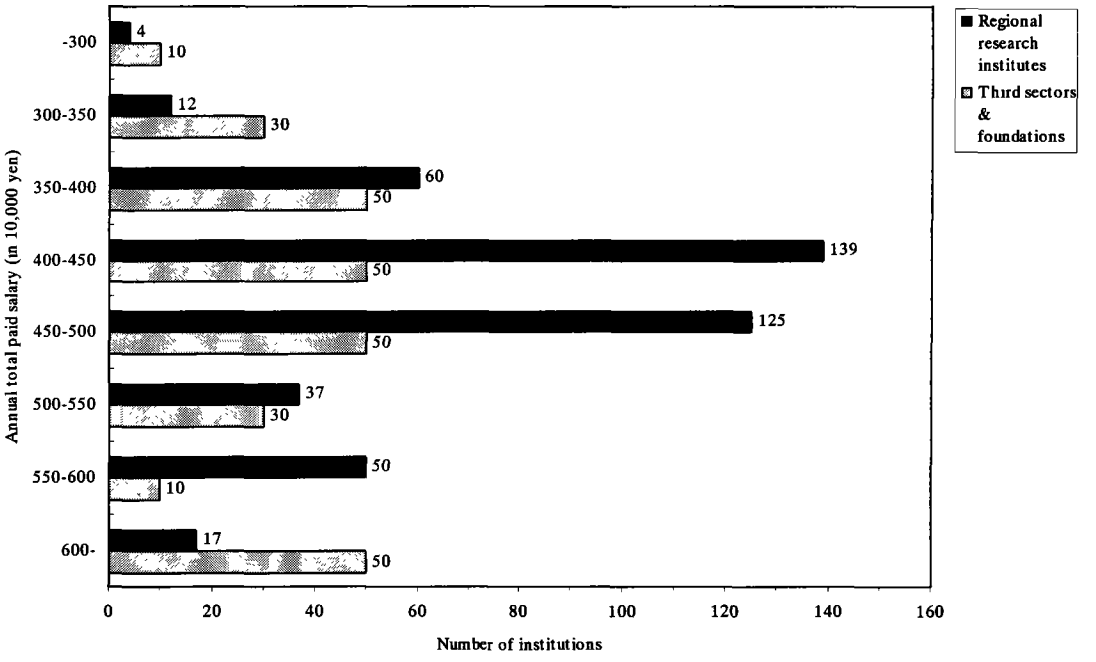


Note: Percentages obtained by simply averaging the education level percentages of researchers obtained from the respective institutions.

(4) Salary levels

To compare the salary levels of researchers in reference to the annual total salaries paid to researchers of about 30 years old, the regional research institutes were outstanding in the two brackets of "4.0 million yen to 4.5 million yen" and "4.5 million yen to 5.0 million yen", while the third sectors & foundations were dispersed widely including the "6.0 million yen or more" bracket (Fig. 5-3-4).

Fig. 5-3-4 Comparison between regional research institutes and third sectors & foundations — Salary levels (annual total salaries paid to researchers of about 30 years old)

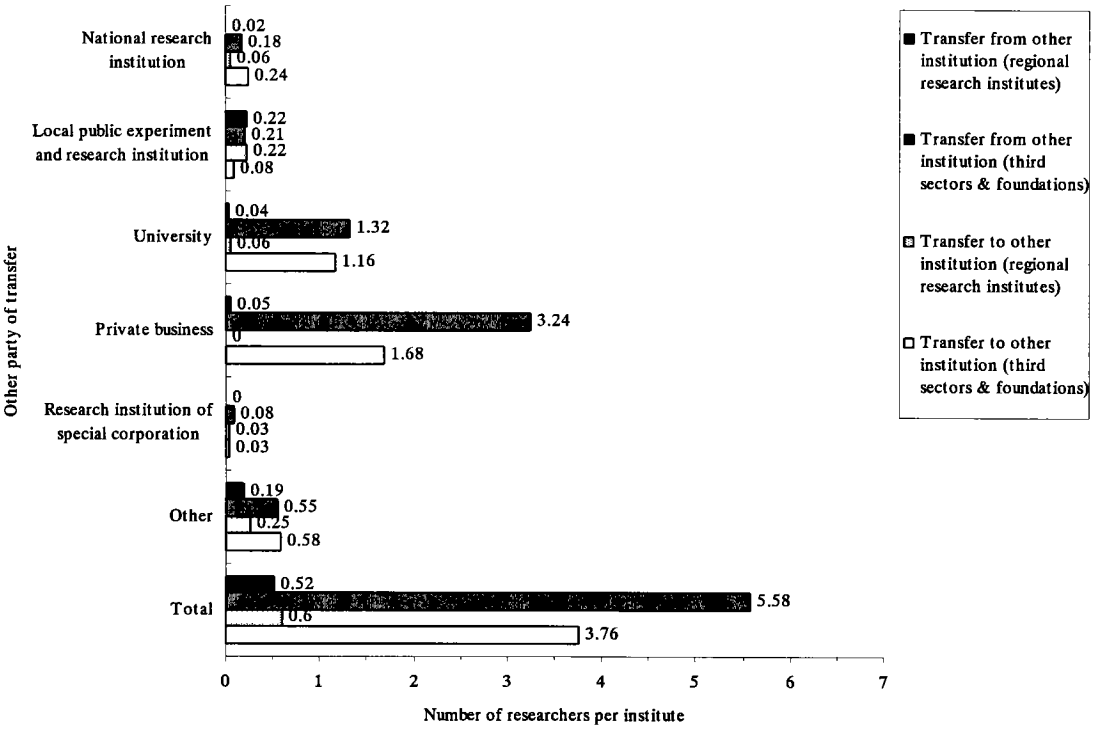


Note: For easier comparison on the graph, the numbers of institutions of "third sectors & foundations" were multiplied by a factor of 10 for graphical expression.

(5) Personnel exchange

To compare the exchange of researchers in reference to the numbers of researchers transferred to and from other institutions, the number of researchers transferred to and from other institutions per institution of third sectors & foundations was larger than that of regional research institutes, and the "number of researchers transferred from other institutions" was about 10 times, while the "number of researchers transferred to other institutions" was about 6 times. Among the respective party categories of institutions as the other parties of exchange, the regional research institutes exchanged frequently to and from "other regional research institute", and the third sectors & foundations exchanged frequently to and from "private business" and "university" (Fig. 5-3-5).

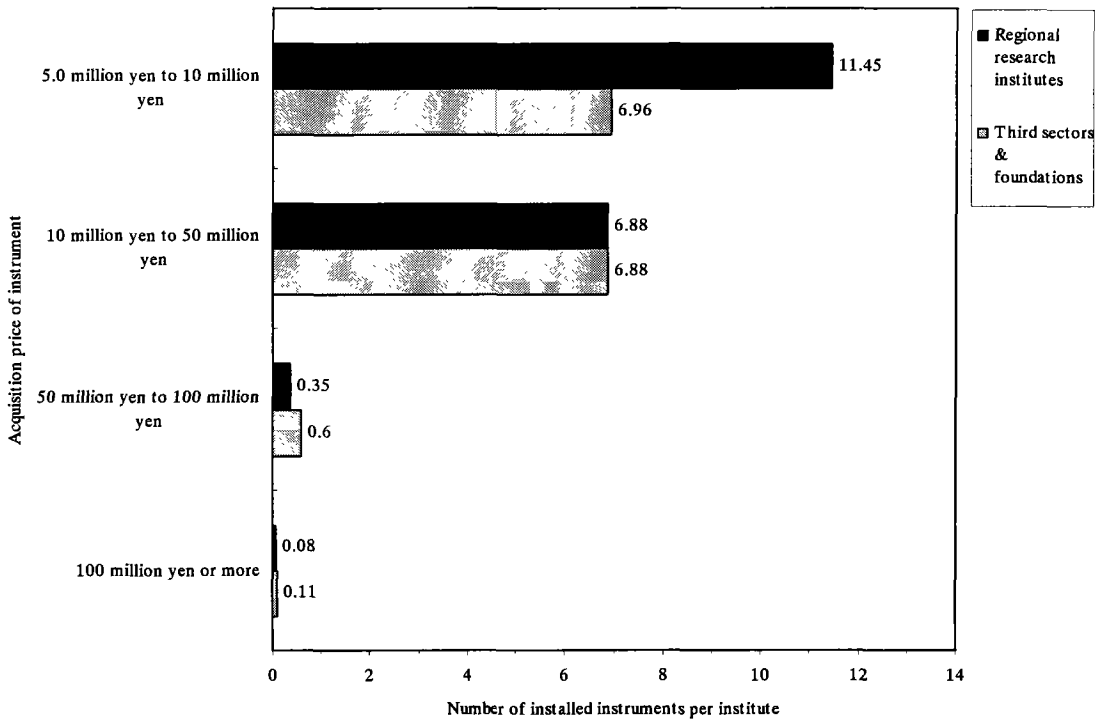
Fig. 5-3-5 Comparison between regional research institutes and third sectors & foundations — Personnel exchange



(6) Installation of expensive instruments

To compare the installation of expensive instruments in reference to the number of installed instruments of 5 million yen or more in acquisition price per institution, the number of instruments of "5.0 million yen to 10.0 million yen" of regional research institutes was larger than that of third sectors & foundations, but the number of instruments of "100 million yen or more" of third sectors & foundations was larger than that of regional research institutes (Fig. 5-3-6).

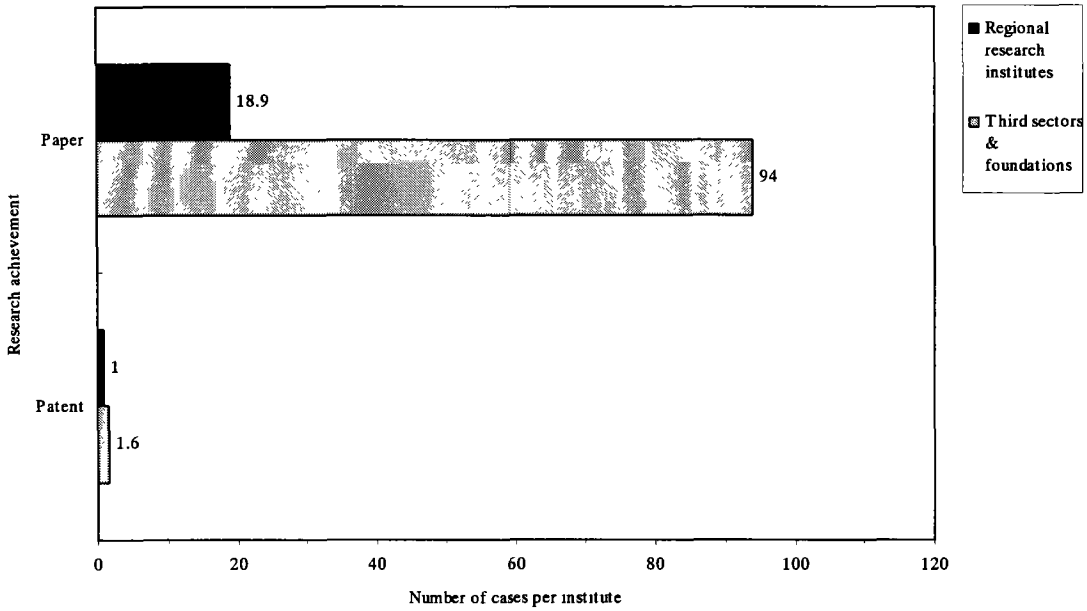
Fig. 5-3-6 Comparison between regional research institutes and third sectors & foundations — Installation of expensive instruments



(7) Research achievements

To compare the research achievements in reference to the numbers of "papers" (= papers published at academic societies, etc.) and "patents" (= registrations of patents, new varieties, etc.) per institution, the third sectors & foundations were larger in both the research achievement items, being about 5 times especially in "papers" (Fig. 5-3-7).

Fig. 5-3-7 Comparison between regional research institutes and third sectors & foundations — Research achievements



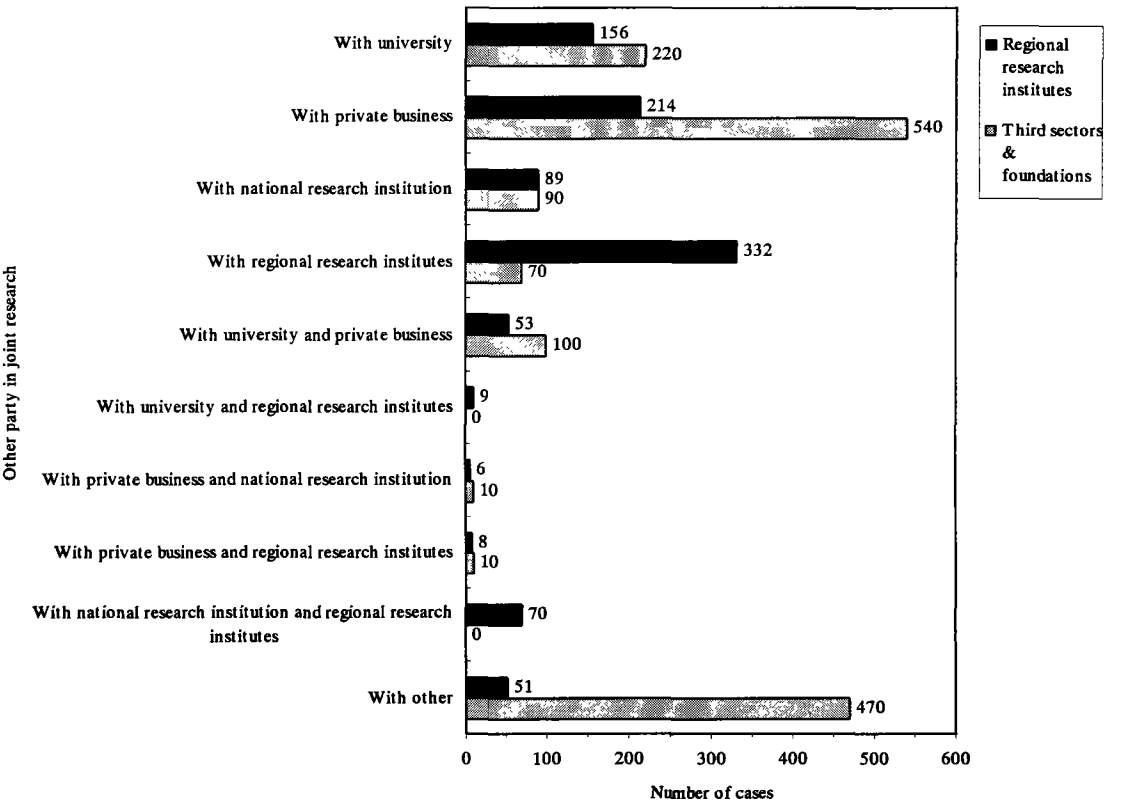
Note: Paper = Paper published at academic society, etc.
Patent = Registration of patent or new variety, etc.

(8) Other parties of joint research

As for the number of joint research cases per institution, that of regional research institutes was 2.5 (1009 joint research cases by 405 answering institutions), and that of third sectors & foundations was 3.8 (147 joint research cases by 39 answering institutions), to show that third sectors & foundations conducted joint research more.

In reference to the numbers of joint research cases by party category of other party in joint research, in regional research institutes, the number of joint research cases with "regional research institute" was largest, being followed by "with private business" and "with university". In the third sectors & foundations, the number of research cases "with private business" was largest, being followed by "with other (hospital, foreign research institution, etc.)" and "with university" (Fig. 5-3-8).

Fig. 5-3-8 Comparison between regional research institutes and third sectors & foundations - Number of cases by party category of other party in joint research



Note 1: For easier comparison on the graph, the number of cases of "third sectors & foundations" were multiplied by a factor 10 for graphical expression.
Note 2: Items large in the number of cases alone were shown.

6-1 Comparison with the previous survey

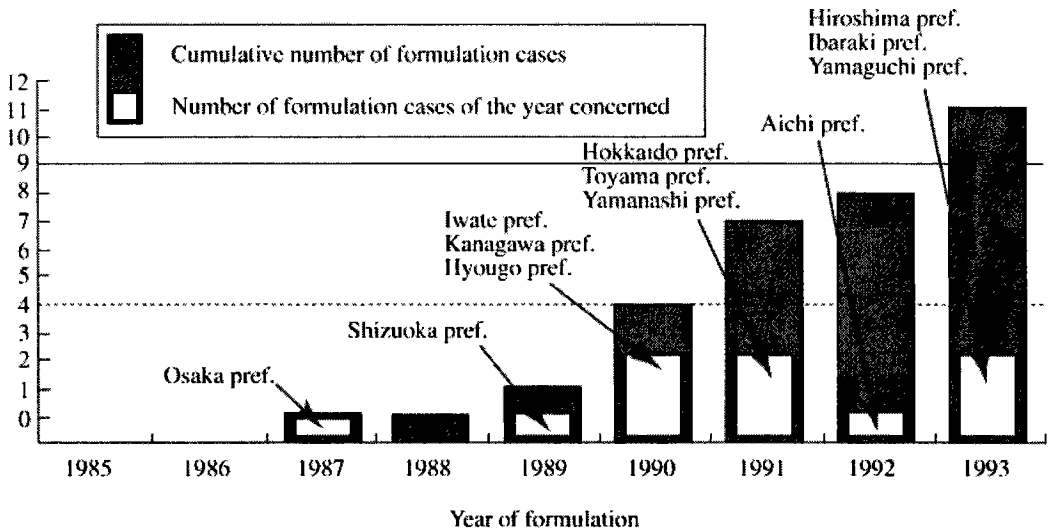
(1) The expenditure for science and technology spent by all the prefectural governments and ordinance-designated city governments were revealed for the first time.

In the present survey on the expenditure for science and technology, all the prefectural governments and ordinance-designated city governments answered, to reveal the total amount of the expenditure for science and technology spent by the local governments (prefectural and ordinance-designated city governments) for the first time. The total amount was 614,000 million yen, and it corresponded to 29% of the national budget for science and technology. As the percentage in the total amount of government expenditure, that of the national government was 1.4% while that of the prefectural governments and the ordinance-designated city governments was 1.1%, almost at the same level. This was as found also in the previous survey.

(2) The number of prefectural governments which established basic guidelines for science and technology policies increased to 12.

In the previous survey (as of the end of FY 1991), 8 prefectural governments formulated the basic guidelines for science and technology policies, and as of the end of FY 1993, 12 prefectural governments formulated the basic guidelines. In two years, the number of prefectures increased by 4 (50% up), and about one fourth of prefectural governments had basic guidelines for science and technology policies.

Fig. 6-1-1 Formulation of basic guidelines for science and technologies (annual changes in formulation cases)



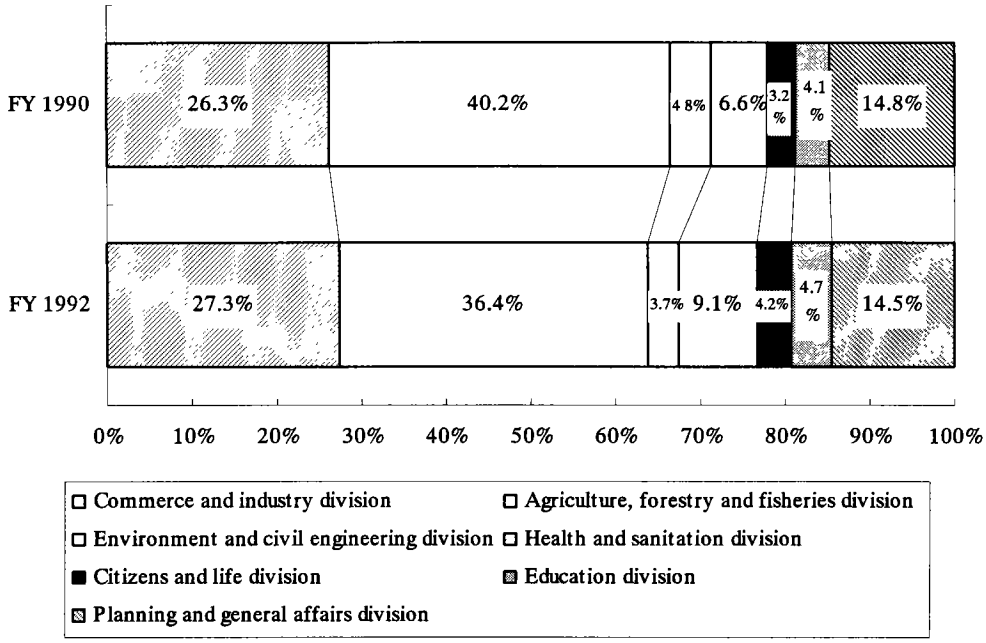
See Table 3-1-4.

(3) The expenditure for science and technology was observed to have shifted to life division

If the percentages of the expenditure for science and technology of prefectural governments by competent administrative division are compared with those in the previous survey, it is notable that the percentage of the agriculture, forestry and fisheries division decreased from 40.2% to 36.4% by 3.8%, and on the other hand, that the percentage of the health and sanitation division increased from 6.6% to 9.1% by 2.5% while the percentage of the citizens and life division increased from 3.2% to 4.2% by 1.0%. The percentage of the commerce and industry division also increased. However, since the percentage of the agriculture, forestry and fishers division decreased relatively greatly, the percentage of both the divisions as industry divisions in the expenditure for science

and technology decreased, and instead, the percentage of the expenditure for science and technology relatively closely relating to citizens and life increased. (If the values found in the present survey are limited to those of 45 prefectural governments which answered in the previous survey, the respective values of 38.8% for the agricultural, forestry and fisheries division, 7.0% for the health and sanitation division, 4.4% for the citizens and life division and 26.6% for the commerce and industry division showed a similar trend, variations being small, except that the increase of the citizens and life division was large. This is because whether or not the values of Tokyo Metropolitan Government were counted mainly affected the decrease in the agriculture, forestry and fisheries division and the increase in the health and sanitation division.) Since only the survey data of twice including the present survey are available, this fact cannot be said to show the trend of shift in expenditure, but the data agree with the direction of policies to be pursued today when the improvement of quality of life is argued.

Fig. 6-1-2 Changes in the percentages of respective competent administrative divisions in the expenditure for science and technology spent by prefectural governments

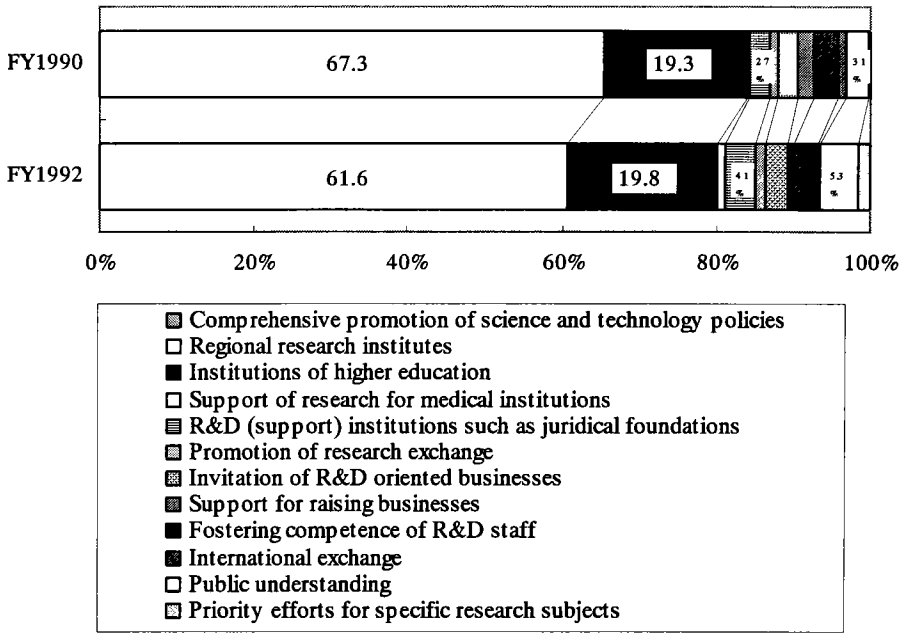


(4) The percentage of the expenditure for science and technology for regional research institutes decreased, and that for R&D (support) institutions such as third sectors & foundations increased.

To compare the percentages of the expenditure for science and technology (of the 45 comparable prefectural governments) by purpose, with those in the previous survey, the expenditure for regional research institutes which was largest in the previous survey decreased from 67.3% to 61.6% by 5.7% (for reference, the percentage of all the 47 prefectural governments was 61.7%, and the percentage of the prefectural governments plus ordinance-designated city governments was 60.5%). On the contrary, the percentage showing the largest growth rate was 2.2% for enlightenment and prevalence promotion (from 3.1% to 5.3%), and this was caused by the natural science museum construction cost, etc. Notable was the growth in the expenditure for R&D (support) institutions such as third sectors & foundations (1.4% up from 2.7% to 4.1%). The expenditure for R&D (support) institutions such as third sectors & foundations spent by all the 47 prefectural governments was 5.5% (also 5.5% even if the expenditure spent by the ordinance-designated city governments was included), taking the third place after regional research institute and academies, above such items as invitation of R&D oriented businesses, raising competent

R&D staff, and enlightenment & prevalence promotion, among the percentages of the expenditure for science and technology by purpose.

Fig. 6-1-3 Changes in the percentages of the expenditure for science and technology by purpose, of prefectural governments (from 1990 to 1992)

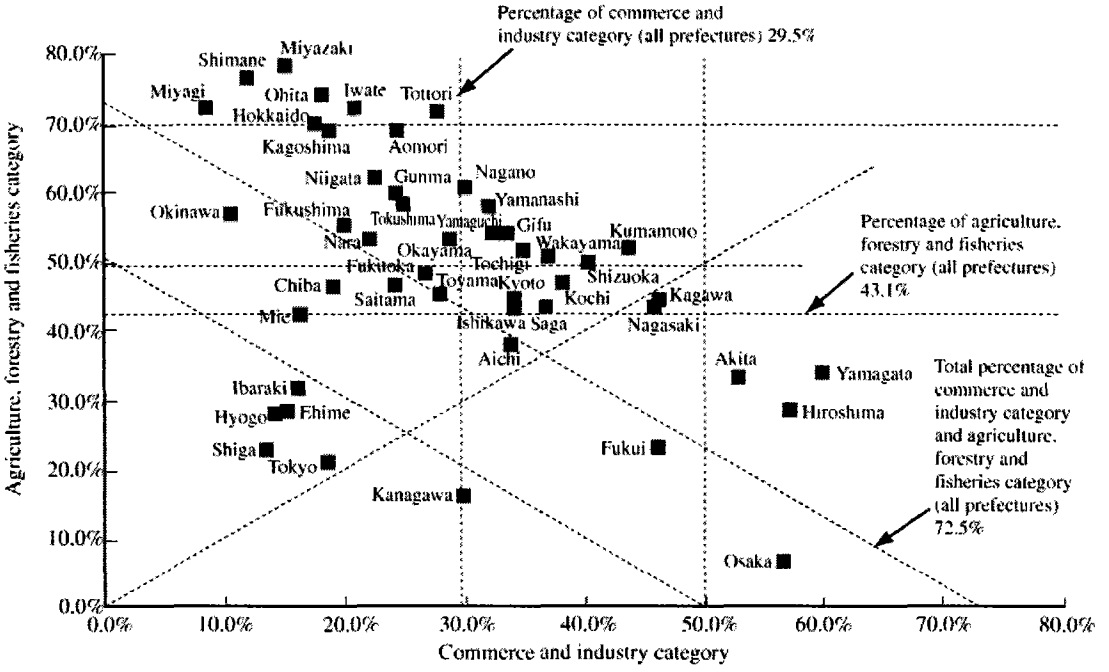


6-2 Relation between Investment for Science and Technology and Policy Targets

(1) Still large investment into agriculture, forestry and fisheries

Fig. 6-2-1 shows a distribution of respective prefectures (including ordinance-designated cities) in the breakdown of ordinary expenditure for science and technology into respective service categories, with the percentage of the expenditure for agriculture, forestry and fisheries chosen as the ordinate and that for commerce and industry, as the abscissa.

Fig. 6-2-1 Percentages of the ordinary expenditure for science and technology by service category (commerce and industry vs. agriculture, forestry and fisheries)



See Table 3-3-6.

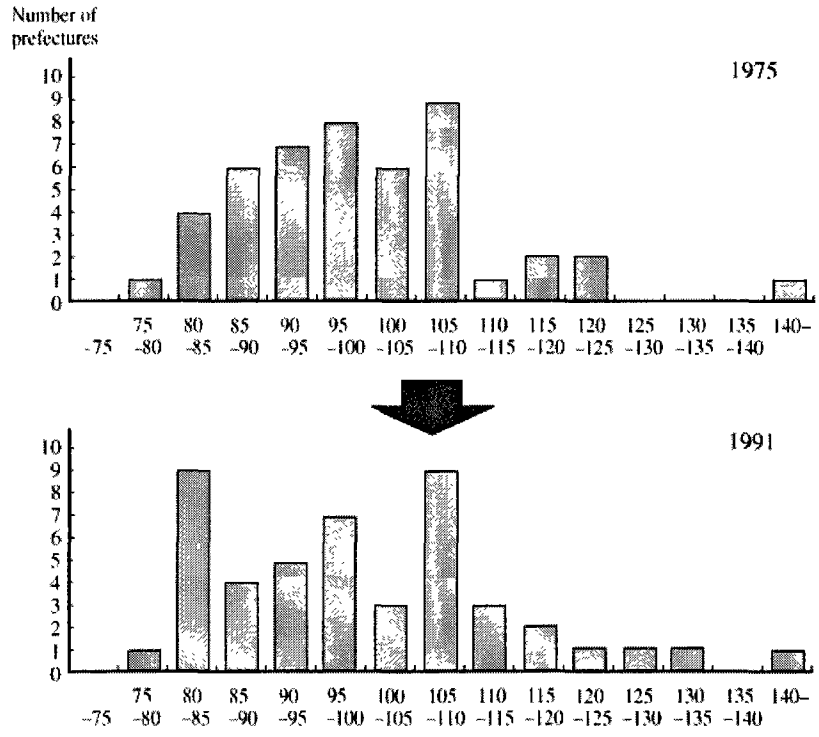
As the total value of the whole nation, the percentage of the expenditure for agriculture, forestry and fisheries was 43.1%, but in about one half, i.e., 24 prefectures, the percentage of the expenditure for agriculture, forestry and fisheries exceeded 50%. There were 6 prefectures which exceeded 70%. It can be understood if some prefectural governments consider the investment in agriculture, forestry and fisheries as a strategy for science and technology policies, but this fact that about one half of prefectural governments invested more than half of the expenditure for science and technology into agriculture, forestry and fisheries suggests the necessity of discussing whether it is right that more than 40% of the expenditure for science and technology spent by prefectural governments and ordinance-designated city governments is invested into this field accounting for 2% (percentage of primary industry in the total of all the prefectures) of the total of gross prefectural products, and also the necessity of re-examining the investment strategies of respective prefectural governments overlooking such figures. The respective prefectural governments are demanded to re-examine how reasonably they took industrial policies based on the regional industrial characteristics with a viewpoint of regional management, and whether the respective governments reasonably carried out the investment for science and technology according to the policies.

(2) Unpredictable relation between the investment into science and technology for commerce and industry category and economic growth

Fig. 6-2-2 is histograms showing the distributions of prefectures in relation with the income per head of prefectural citizens of 1975 and 1991 (each income value was divided by the mean value

of each year). It can be seen that the income distribution was polarized, contrary to the argument to pursue well-balanced development of the nation.

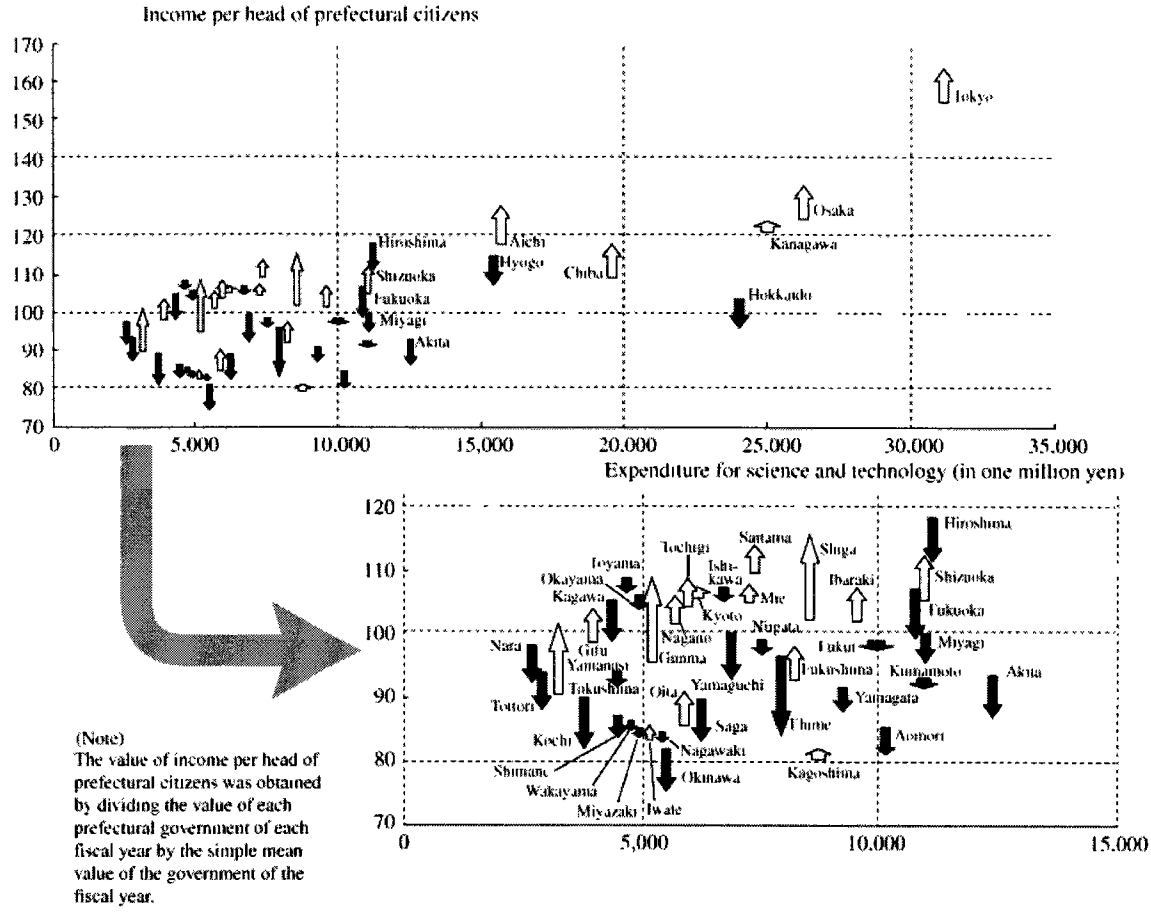
Fig. 6-2-2 Histograms showing the distributions of prefectures based on per capita prefectural citizens' income (with the average as 100)



How to face this tendency is also a very important issue. The relation between the change in the relative position of prefectural citizens' income and the expenditure for science and technology is shown in Fig. 6-2-3. Each upward arrow (open) indicates that the relative position of the income per head of prefectural citizens rose, and on the contrary, each downward arrow (closed) indicates that the position declined. Since only nearby data are available on the expenditure for science and technology, plotted here was the relation reverse to the input output relation usually referred to for seeing the relation between the changes of economic growth in the past and the investment for science and technology at the present moment. No clear correlativity can be seen between both.

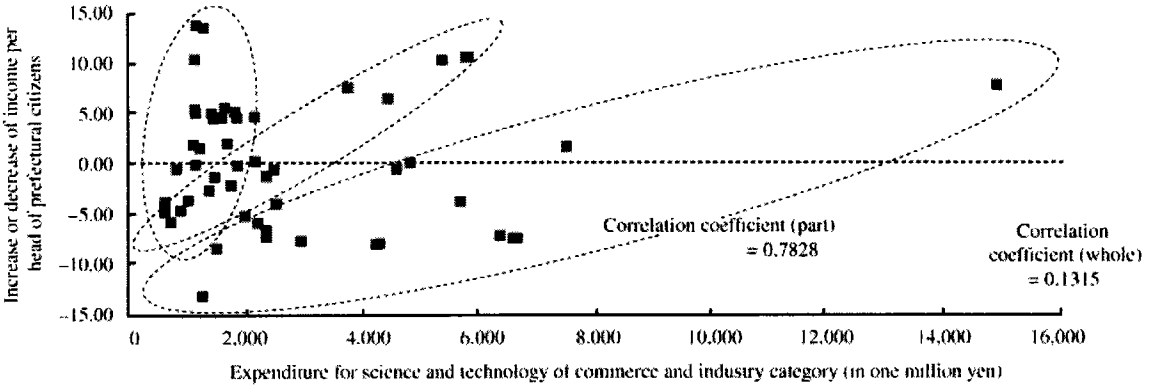
In Fig. 6-2-4, the value obtained by subtracting the value of income per head of prefectural citizens in 1975 from that in 1991 was chosen as the ordinate, and the expenditure for science and technology of commerce and industry category, as the abscissa (per head of prefectural citizens and total amount). No general correlatively was observed either, but if the relative positions of the respective prefectures are seen on the graph, the data may be able to be considered to present some pieces of reference information for examining the investment levels of the respective prefectural governments toward economic growth.

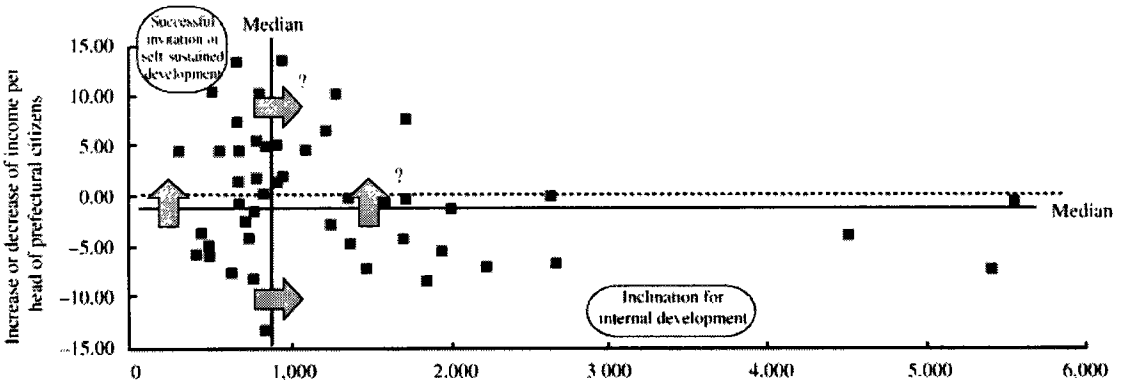
Fig. 6-2-3 Changes in the income per head of prefectural citizens (from 1975 to 1991, relative value to average) and the expenditure for science and technology (total of prefectural governments and ordinance-designated city governments, ordinary expenditure, FY 1992)



(Note)
The value of income per head of prefectural citizens was obtained by dividing the value of each prefectural government of each fiscal year by the simple mean value of the government of the fiscal year.

Fig. 6-2-4 Expenditure for science and technology of commerce and industry category (total of prefectural governments and ordinance-designated city governments, ordinary expenditure, FY 1992) and the increase or decrease of income per head of prefectural citizens (change in the relative income value to simple mean value, from FY 1975 to FY 1991)





Note: The value of increase or decrease of income per head of prefectural citizens was obtained by substracting the value obtained by dividing the income per head of prefectural citizens by the simple mean of each prefecture of FY 1991 from that of FY 1975.

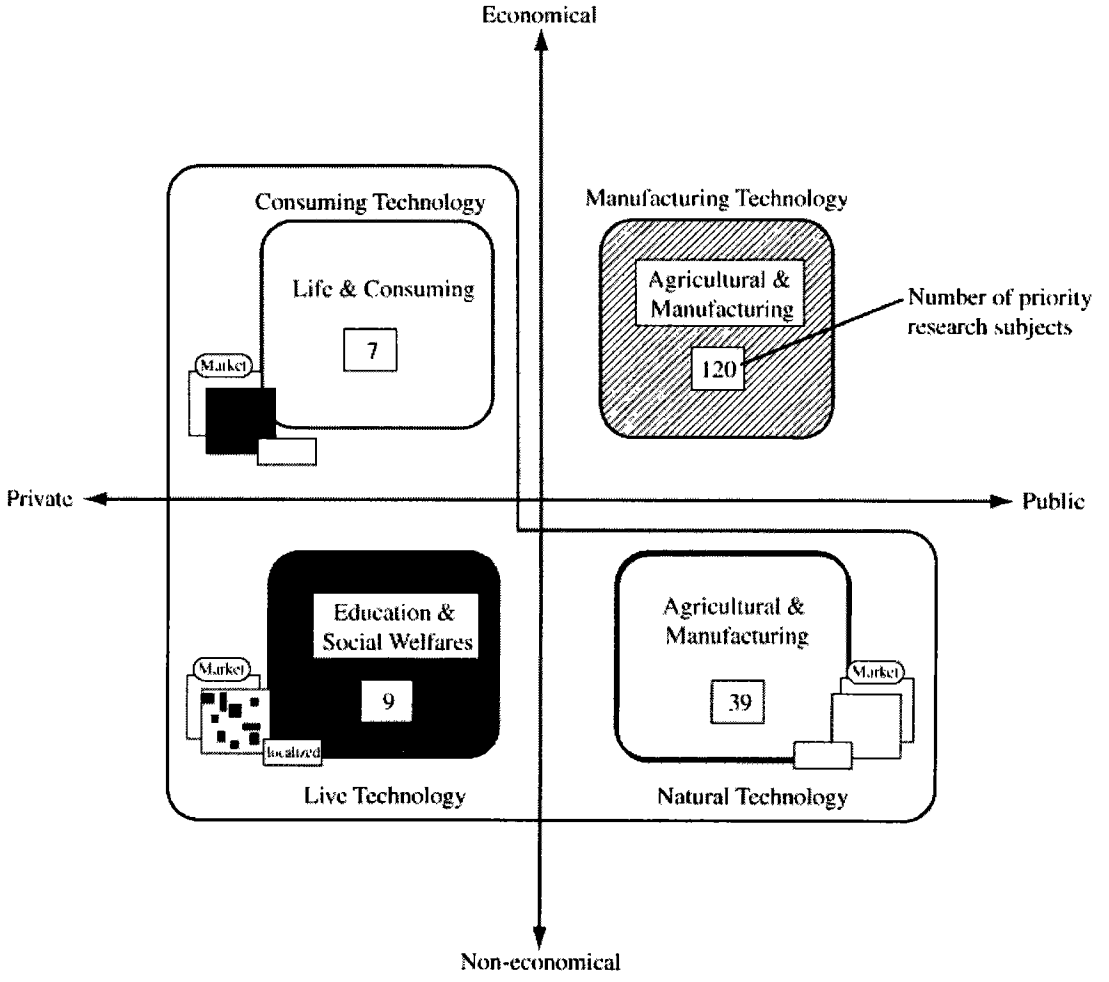
(3) Growing diversification in science and technology policies

In Fig. 6-2-1, the large expenditure for agriculture, forestry and fisheries was indicated, and from the diagram, the degree of growing diversification in the investment for science and technology can also be read. The total of the expenditure for the agriculture, forestry and fisheries category and the expenditure for commerce and industry category can be almost regarded as the expenditure for science and technology of industries. The number of prefectures in which the percentage of the expenditure for science and technology of industries exceeded 72.5% which was the total percentage of all the prefectures (whether this 72.% is high or low must also be discussed) reached 34, i.e., two thirds of all the prefectures, but on the other hand, the number of prefectures in which the expenditure for science and technology of the other categories than the agriculture, forestry and fisheries category and the commerce and industry category accounted for more than 50% was as many as 6. There were also ten prefectures in which the expenditure for the agriculture, forestry and fisheries category and the commerce and industry category accounted for more than 90%, but prefectures which declared to pursue the science and technology policies for improvement of

quality of live were also increasing. Generally, it can be said that the diversification in science and technology policies is growing.

Also in reference to the priority research subjects grappled with by respective prefectural governments and ordinance-designated city governments, the tendency can be indicated. Fig. 6-2-5, shows priority research subjects counted on a plane with the economy axis taken as the axis of ordinates, and the social axis as the axis of abscissa (showing a new paradigm of science and technology policies). Though subjects tended to be dense in the industries category, it can be seen that research subjects were somewhat increasingly diversified mainly in the environment category.

Fig. 6-2-5 A new framework of science and technology policies, and numbers of priority research subjects grappled with by prefectural governments and ordinance-designated city governments



(4) Conclusion

If the results of the present survey are looked at from the viewpoint of the relation between policy targets and the investment into science and technology, the realities are revealed that the correlativity of the investment into science and technology with the industrial structures of respective regions and with the policy targets declared to be pursued is low. The surveyed data suggest the necessity of establishing original policy targets without being drifted by the general trends and the past practice, and of taking strategic policies for achieving the targets. To meet the necessity, it is necessary to develop a theoretical framework (model) for judging the policy targets and to accumulate time series data.

As for model development, for example in the case of public investment, numerical models were developed on the relation between investment and policy targets, and are used on trial for formulating policies in comprehensive national plans, etc., but for science and technology, such a model is not yet developed. As already attempted by Gonda et al., it is desired to promote the research on a theoretical framework including said model concerning the diversification of science and technology policies.

6-3 New Trends in the Research and Technological Development Activities Conducted by Local Governments

(1) New R&D institutions likely to allow diverse development

There are 166 R&D (support) institutions such as third sectors & foundations established under investment and endowment by prefectural governments and ordinance-designated city governments. The number of regional research institutes of prefectural governments and ordinance-designated city governments is 575. So, third sectors & foundations corresponding to less than 30% of the regional research institutes were established. On the other hand, the regional research institutes restructured or newly established after 1984 account for 34.1% of all the regional research institutes (results of questionnaring to the regional research institute, and of only those answering).

Fig. 6-3-1 Owning/borrowing patterns of building and research equipment and researcher employment patters of R&D institutions such as third sectors & foundations

Building, etc. owning/ borrowing pattern	Building		Research equipment		Number of institutions
	Owning	Borrowing	Owning	Borrowing	
1	○	○	○	○	1
2	○	○	○	×	1
3	○	○	×	○	0
4	○	○	×	×	0
5	○	×	○	○	0
6	○	×	○	×	17
7	○	×	×	○	0
8	○	×	×	×	1
9	×	○	○	○	4
10	×	○	○	×	7
11	×	○	×	○	7
12	×	○	×	×	3
13	×	×	○	○	0
14	×	×	○	×	0
15	×	×	×	○	0
16	×	×	×	×	0
Total					41

Researcher employment pattern	Regularly employed		Loaned		Number of institutions
	Tenured	Term-limited	Paid	Non-paid	
1	○	○	○	○	0
2	○	○	○	×	1
3	○	○	×	○	2
4	○	○	×	×	3
5	○	×	○	○	2
6	○	×	○	×	6
7	○	×	×	○	4
8	○	×	×	×	4
9	×	○	○	○	0
10	×	○	○	×	2
11	×	○	×	○	0
12	×	○	×	×	1
13	×	×	○	○	0
14	×	×	○	×	5
15	×	×	×	○	7
16	×	×	×	×	0
No answer					4
Total					41

If these R&D institutions are divided into three groups; R&D (support) institutions such as third sectors & foundations, restructured or newly established regional research institute, and non-restructured regional research institutes, to see the respective features, it is first of all notable that the R&D (support) institutions such as third sectors & foundations are diverse in patterns. As shown in Fig. 6-3-1, there were many institutions which did not own their buildings or research equipment, and researcher employment patterns are also diverse. The researchers of R&D institutions such as third sectors & foundations were young in age bracket and high in higher education level, being highly flexible also in view of funds, etc. However, in view of experiment and research equipment, regional research institutes (especially restructured or newly established regional research institute) were rather more enriched. As for research achievements, third sectors & foundations were especially remarkable in paper presentations at academic societies, but third sectors & foundations and restructured or newly established regional research institutes were at the same level in registrations of patents and new varieties. In equipment and product development, regional research institutes were higher.

From these data, it can be felt that the R&D institutions including non-restructured regional research institutes established by local authorities are likely to allow diverse development.

(2) Unexpectedly wide utilization of external resources

The regional research institutes not engaged in joint research accounted for one third, and the number of joint research cases tended to decrease (see 6.1 (6)). On the other hand, there are data also showing that external resources were widely utilized.

External research contracts were made by about one third of R&D institutions such as third sectors & foundations (5 contracts per institution, average 17.8 million yen per contract), and also about one fourth of regional research institutes made external research contracts (6 contracts per institution, average 8 million yen per contract). Research funds were also accepted from outside by about one half (47%) of regional research institutes (14.7 million yen per case).

Also in view of researchers, the personnel exchange and transfer of researchers were carried out by more than one fourth of regional research institutes, though mainly between regional research institute, and it can be said that the utilization of external resources showed certain prevalence.

(3) Conclusion

Into the regional research institutes, the expenditure for science and technology was invested by 60.5% (371,700 million yen), and into the R&D (support) institutions such as third sectors & foundations, the expenditure for science and technology was invested by 5.5% (33,700 million yen) (FY 1992). On the other hand, the R&D (support) institutions such as third sectors & foundations had funds and capitals of more than 230,000 million yen accumulated (only of 139 answering institutions), and since the fruits from them, etc. were added as a financial source, the service scale of the R&D (support) institutions such as third sectors & foundations was 65,100 million yen (corresponding to 10.6% of the total amount of the expenditure for science and technology spent by the prefectural governments and ordinance-designated city governments).

R&D (support) institutions such as third sectors & foundations which were less than about 30% in the number of institutions and about one fifth in service scale compared to the regional research institute have become increasingly important like this, and as described in (1), the survey data show the possibility that they in combination with the existing regional research institutes may pursue research and technological development activities variously. This should not be interpreted as a fashion for establishing third sectors & foundations, but as the advocacy of necessity to manage R&D institutions for achieving policy targets and to manage the utilization of external sources anticipated to be more and more important.

CHAPTER 7 CONCLUSION

The previous chapter analyzed and discussed the features of the results of the present survey in comparison with the results of the previous survey. This chapter discusses what policies are expected to be taken in response and briefly summarizes future problems, based on the conclusions derived from the present study through such analysis and discussion.

1. Expenditure for Science and Technology Spent by Local Governments

What is important among the findings of the present survey is that not only the total amount of the expenditure for science and technology spent by all the 47 prefectural governments and 12 ordinance-designated city governments in Japan but also the amounts spent by respective competent administrative divisions, for respective service categories and for respective purposes have been clarified for the first time. The total amount based on the settlement of FY 1992 reached 614,000 million yen, and it corresponded to 28.8% of the national government's expenditure for science and technology in the same fiscal year. In terms of each local government, it means that each prefectural government spent about 12,200 million yen and that each ordinance-designated city government spent about 3,200 million yen. It is also very significant that the present survey has demonstrated that the various data obtained in the previous first survey (45 prefectural governments and 7 ordinance-designated city governments) reflected almost the actual conditions, therefore that quantitative analysis reliable to some extent can be started from now on, and that the local governments who are going to utilize the present survey report as reference data for formulating their science and technology policies in future can evaluate their respective policies in perspective since the reliability of various data has improved and since the specific contents of measures for science and technology have been widely clarified.

2. Roles Shared by the National and Local Governments Found in the Expenditure for Science and Technology

As for the percentage of the total amount of expenditure for science and technology spent by local governments in FY 1992 in the total amount of government expenditure of local governments in comparison with that of the national government, while the percentage of the national government was 1.4%, the percentage of prefectural governments and ordinance-designated city governments was 1.1%, being almost on the same level. However, the percentage of the amount of expenditure for science and technology (ordinary expenditure) in the amount of government expenditure of each prefectural government was greatly different from prefectural government to prefectural government. The percentages ranged from maximum 2.12% to minimum 0.43%, being different by a factor of more than 5, and their mean value was 0.78%. This great difference in the percentages among the respective local governments is a problem. The reason is that there are little reference data and theoretical standard to which local governments can refer when they decide their adequate scales of expenditure for science and technology. In the case of expenditure for science and technology, it takes a long time before the effects of investment are manifested, and the process of effect manifestation is complicated and elusive. This is the time when the local governments and the national government should discuss the establishment of any reasonable standard which can be commonly referred to by the local governments.

On the other hand, the total amount of expenditure for science and technology spent by the prefectural governments and ordinance-designated city governments in FY 1992 corresponded to 29% of that of the national government, and the amount cannot be said to be large enough since the total amount of government expenditure of the local governments corresponded to 78% of the national general account budget. Furthermore, while the rate of the national government's expenditure for science and technology to GNP was 0.47%, the rate of the expenditure for science and technology of prefectural governments to the prefectural citizens' income was 0.13%, being different by a factor of 3.6. This can be said to suggest one of targets in setting the reasonable level of expenditure for science and technology to be borne by prefectural governments and ordinance-designated city governments. Of course, whether or not local governments should bear the expenditure for science and technology at the same level as that of the national government is yet to be discussed. However, at least for the local governments who wish to increase the expenditure for science and technology in future for regional economic development and improvement of quality of life, how to find the financial resources will be a problem.

Anyway, for local governments to increase the expenditure for science and technology, it can be considered to take either method of promoting regional economic development to expand the financial scale for increasing the total amount, or of approving to secure a new financial resource for promotion of science and technology at each local government in proportion to the gross prefectural product. In discussing regional science and technology policies, this is the time for newly discussing the financial resource problem, including the problem of the reasonable scale of expenditure for science and technology to be borne by local governments.

3. Investment of Expenditure into Science and Technology and Regional Economy

As found in the previous survey, little correlation is observed between the expenditure for science and technology and various economic indicators in the respective local governments. The indicator which showed the highest correlation with the expenditure for science and technology was the population, and yet the correlation coefficient was about 0.6. None of gross prefectural product, government expenditure, shipment index of manufacturing industry, added value production, prefectural citizens' income, etc. showed correlation.

Notable were the changes of prefectural citizens' income for the past 17 years (1975 to 1991) in Japan. Especially after the 1980s, the distribution of respective prefectures in reference to the income per head of prefectural citizens showed peaks at two different income levels, suggesting that polarization occurred. In reference only to the income per head of prefectural citizens, a tendency was observed that rich regions became richer while poor regions became poorer. And yet, no correlation was observed between this tendency in the income per head of prefectural citizens and the expenditure for science and technology.

On the other hand, as for the purposes in the use of the expenditure for science and technology, 62% of the expenditure was used for promotion of agriculture and manufacturing industry, and in addition, the ratio of the expenditure for agriculture to that for manufacturing industry was almost 4 : 3 on the average of the whole nation, while the ratio of agriculture to manufacturing industry in the gross prefectural product was 2 : 37. This is the reason why the expenditure for science and technology of local governments did not show any correlation with various economic indicators. The actualities are that 43.1% of the expenditure for science and technology was used for the agriculture accounting for 2% of the gross prefectural product. We do not think this situation will continue also in future. However, to improve the investment effects of the expenditure for science and technology by local governments in future, it will be necessary to increase the investment into the promotion of science and technology in the manufacturing industry in reasonable response to the changes of industrial structure in respective regions.

4. Problems of R&D (and support) Institutions such as Third Sectors and Juridical Foundations

Compared to the previous survey, remarkable growth of expenditure was observed in the expenditure for R&D (and support) institutions such as third sectors and juridical foundations established under investment by local governments. The expenditure accounted for only 4.1% of the total expenditure for science and technology, but the growth rate in two years from 1990 to 1992 was as high as 82%. The total number of such institutions was 166, and especially after 1983, the number of such institutions sharply increased. Among them, the number of institutions actually engaged in R&D was at least 41, corresponding to 7% of 575, the total number of public experiment and research institutions in Japan.

One problem is that while the total fixed number of local public service personnel is controlled, the establishment of juridical persons as so-called third sectors, juridical foundations, etc. is substantially equivalent to the expansion of the administrative regime and to the increase of personnel by establishing new R&D (and support) institutions outside the administrative regime. Of course, the personnel are not officially the personnel of prefectural governments, but actually include many loan employees from prefectural governments. Another problem is that the total amount of funds and capitals of 139 institutions who answered in the present survey among 166 institutions reached 232,400 million yen, and that it becomes already difficult to operate these R&D (and support) institutions by managing only these funds. Actually the total amount of expenditure from prefectural governments to these institutions in FY 1992 reached 23,700 million yen, accounting for 5.5% of the total amount of expenditure for science and technology spent by local governments (2.9% in the previous survey). Certainly local public experiment and research institutions are being steadily restructured, and the expenditure to them steadily decreased from 67.3% found in the previous survey to 61.7% by 5.7%. However, it can be said that the substantial portion of the decrement was used by R&D (and support) institutions such as third sectors and juridical foundations.

Of course it is to be highly evaluated that the new type of R&D (and support) institutions are growing as new nuclei of regional science and technology activities, and it may be too early to evaluate the policy effects at this stage. However, since financial and personnel problems arise actually commonly, it is urgently desired to respond by defining the roles of the new type of R&D (and support) institutions in the entire image of measures for regional promotion of science and technology, that is, by clarifying the roles shared by them including the liaison with the existing institutions and developing comprehensive management techniques for regional resources of science and technology.

5. External Economy in R&D activities and Investment for Science and Technology

The increase in the mobility of researchers and research funds to and from outside for R&D activities has close relation with the enhancement of efficiency in R&D activities by utilization of external resources. What is notable in the present survey is that not only R&D institutions such as third sectors and juridical foundations but also local public experiment and research institutions actively utilized external resources. This means that the economical effects of external resources become more and more important in R&D activities. Actually one third of the former institutions and one fourth of the latter institutions made research contracts with external institutions. In the case of former institutions, the number of external research contracts reached 5 per institution, and the average amount per contract was 17.8 million yen. In the case of local public experiment and research institutions, the amount per contract was as small as 8 million yen, but the number of contracts was as large as 6 per institution. On the contrary, the internal research contracts were made by more than 80% of R&D institutions such as third sectors and juridical foundations and by about one half of local public experiment and research institutions, showing high transfer of research funds.

Such more active utilization of external resources in R&D activities means that reasonable effects of external economy begin to work, but the mechanism is not clarified yet. However, if the effects of external economy working in R&D activities can be completed by the investment in the external R&D efforts (support for promoting the utilization of external resources), it means that a function as the so-called "public investment" is manifested, and it can be interpreted that the social role of the utilization of external resources is very important. Considering that the investment in the expenditure for science and technology has a more intensive nature of public investment, it can be concluded that the investment in regional science and technology activities by public funds from local governments and the national government should be more positively increased as the so-called "public investment".

6. Diversification of Science and Technology Needs and Regional Science and Technology

In the expenditure for science and technology, the percentages of the ordinary expenditure of FY 1992 spent for respective service categories other than industrial promotion were 17.1% for environment & civil engineering and health & sanitation, 0.2% for citizens and life, 7.8% for education and 2.6% for planning and general affairs. The problem in this case is how to evaluate the fact that about 30% of the expenditure for science and technology is used for other than industrial promotion. It is well known that the achievements of science and technology can be practically used in a very wider range also beyond industries. The expenditure for science and technology in the so-called living society area becomes very important in respective regions. It is to be noted that while the expenditure for local public experiment and research institutions is steadily decreasing, the expenditure for science and technology in the living society area directly contributing to the improvement of quality of life tends to increase.

However, since the development and prevalence promotion of science and technology in this area are generally less likely to be subject to the market mechanism compared to the efforts for industries, it is a large issue to decide who should be engaged in development and how to promote the prevalence of its achievements. In the formulation of regional science and technology policies, R&D subjects of science and technology for improving quality of life are being highlighted as new regional social needs, and it is strongly desired to establish the methodology for developing science and technology and promoting the prevalence of R&D achievements in this area.

7. Problems for Fostering Competence of Scientists and Engineers in Regions

Among the expenditure for science and technology of local governments for respective purposes, the expenditure for local public experiment and research institutions is the largest, being followed by the expenditure for academies. The total amount of expenditure for academies spent by prefectural

governments and ordinance-designated city governments in FY 1992 reached 126,200 million yen, accounting for 20.6% of the entire expenditure for science and technology. In the case of the local governments taking the highest four places in the total amount of expenditure for science and technology among respective prefectural governments in the same fiscal year, the expenditure for academies accounted for as large as 75% of the entire expenditure for science and technology. Actually the prefectural governments and ordinance-designated city governments prominent in the expenditure for science and technology among all the local governments have their own academies such as universities as a main cause for the large expenditure.

In the situation where the roles to be played by respective regions in research and technological development activities become increasingly important, the roles to be played by respective regions also for fostering competence of scientists and engineers also become increasingly important. However, the financial burden necessary for it is enormous. The national government should promote the discussion on the roles to be shared by the national government and the local governments in the fostering of competence of scientists and engineers, and examine the measures for reducing the financial burden of the local governments for fostering competence of scientists and engineers, especially the financial burden for maintaining academies such as universities.