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Research and development activity, 2022

– Research and development –

Total expenditures for research and development activities (R&D) in 2022 amounted to over RSD 68 billion RSD (68,574,283 in thousands), and their participation in GDP amounts 0,97%.

In total expenditures for R&D, the share of gross investments is 8%, which represents an increase of 1% compared to the previous year, while the share of current expenditures is 92%.

In the total number of organizations engaged in research and development activities, the business sector participated with 55%, higher education with 29%, the government sector with 15%, and the non-profit sector with 1%.

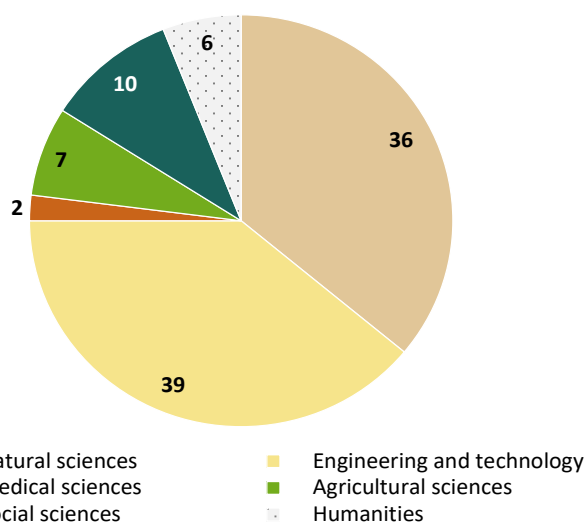
In 2022, there were 24,838 persons employed in this activity, of which 17,512 persons are researchers. In the total number of employees, the participation of women is 53%. The participation of researchers employed in NIRD increased by 3% compared to the previous year and their participation in the total number of employees is around 71%.

T1. Gross domestic expenditures for research and development by scientific fields and sectors

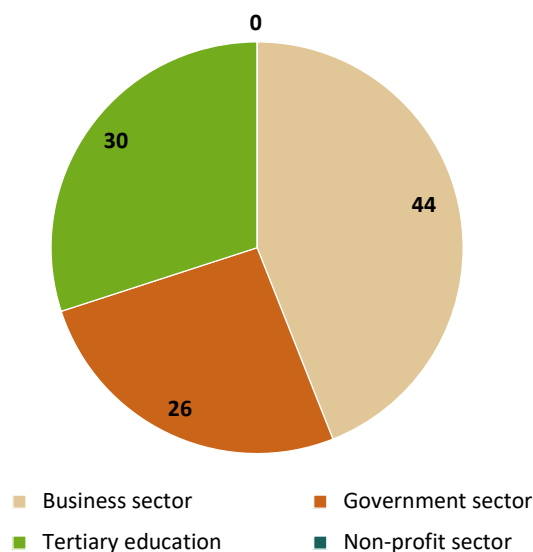
(in thousands of dinars)

	Gross domestic expenditure	Gross investments	Current costs		
			Total	Gross salaries	Material costs
REPUBLIC OF SERBIA	68574283	5588525	62985758	38876805	24108953
Natural sciences	24385214	1574347	22810867	15273390	7537477
Engineering and technology	26562971	3478703	23084268	10950213	12134055
Medical sciences	1754101	75267	1678834	978798	700036
Agricultural sciences	5106413	135790	4970623	3877995	1092628
Social sciences	6910320	220659	6689661	4839891	1849770
Humanities	3855264	103759	3751505	2956518	794987
Business sector	29987035	3625844	26361191	12510822	13850369
Government sector	18003481	1087100	16916381	13286770	3629611
Tertiary education	20581410	875581	19705829	13078530	6627299
Non-profit sector	2357	-	2357	683	1674

Graph 1. Gross domestic expenditures for research and development by scientific fields, %



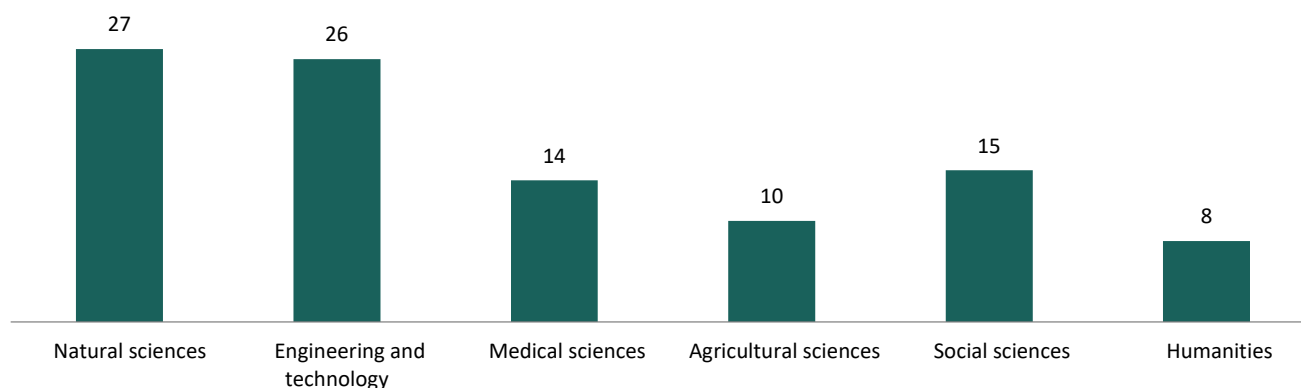
Graph 2. Gross domestic expenditures for research and development by sectors, %



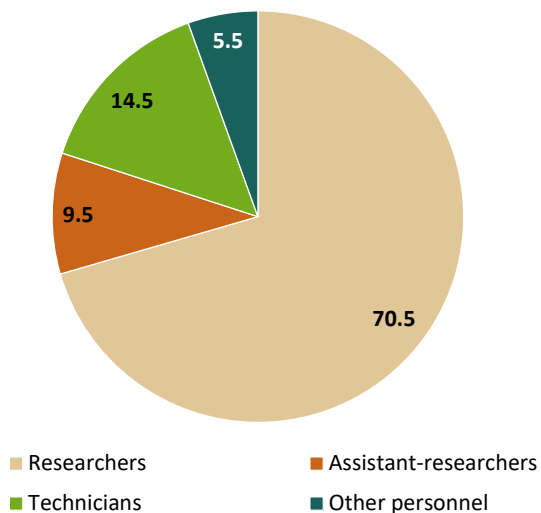
T2. Employees engaged in R&D activities by sectors, fields of science and sex

	Total		Researchers		Assistant-researchers		Technicians		Other personnel	
	All	Women	All	Women	All	Women	All	Women	All	Women
REPUBLIC OF SERBIA	24838	13093	17512	9189	2352	1284	3597	1851	1377	769
Natural sciences	6578	3439	4522	2501	791	383	1001	418	264	137
Engineering and technology	6493	2765	4392	1825	605	265	1141	463	355	212
Medical sciences	3475	2114	2940	1724	157	109	334	260	44	21
Agricultural sciences	2434	1314	1199	662	179	95	515	283	541	274
Social sciences	3802	2121	2844	1470	399	273	442	302	117	76
Humanities	2056	1340	1615	1007	221	159	164	125	56	49
Business sector	4056	1440	1982	693	795	298	1044	336	235	113
Government sector	5867	3375	3490	2141	421	236	1279	631	677	367
Tertiary education	14912	8275	12037	6352	1136	750	1274	884	465	289
Non-profit sector	3	3	3	3	-	-	-	-	-	-

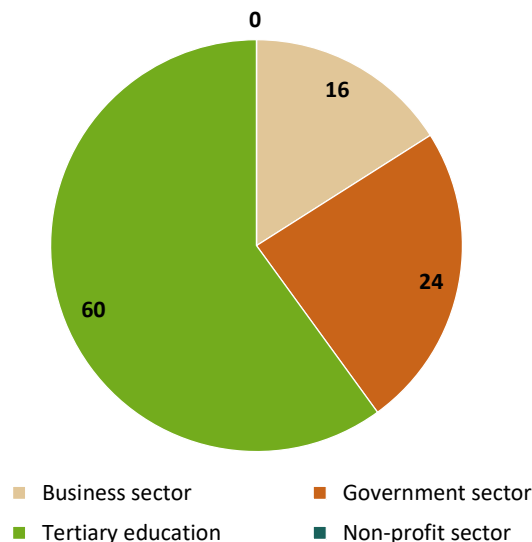
Graph 3. Employees engaged in R&D activities by fields of science, %



Graph 4. Employees engaged in R&D activities by occupation, %



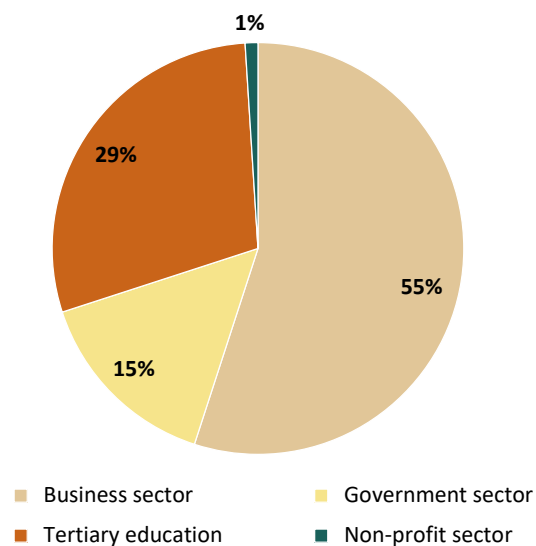
Graph 5. Employees engaged in R&D activities by sectors, %



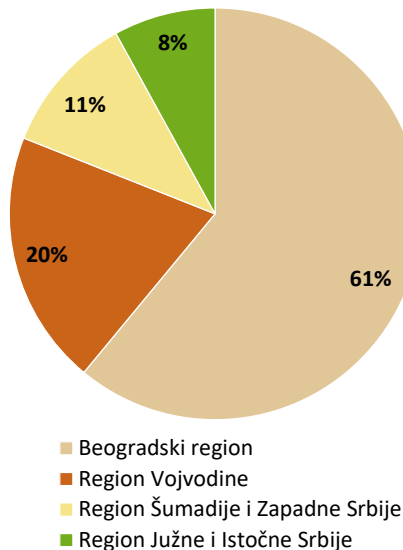
T3. R&D organizations by sectors and by regions

	Total	Business sector	Government sector	Tertiary education	Non-profit sector
REPUBLIC OF SERBIA	390	214	61	113	2
Beogradski region	239	129	51	58	1
Region Vojvodine	76	47	6	22	1
Region Šumadije i Zapadne Srbije	42	23	2	17	-
Region Južne i Istočne Srbije	33	15	2	16	-
Region Kosovo I Metohija

Graph 6. R&D organizations by sectors



Graph 7. R&D organizations by regions



Methodological explanations and definitions

Data source

The presented data are the result of a regular annual survey on research and development activities, conducted in 2022. The basic set of survey is all organizations that are engaged in research and development (R&D), regardless of whether it is their core activity or not.

The main sources of data are: documentation of personnel services on the distribution of employees on R&D jobs, accounting records on realized income and calculated investments in R&D, as well as documentation of professional services on the results of research work.

Coverage and comparability

Data on the R&D activity of higher education institutions and institutes are collected as a complete coverage (all faculties/academies, regardless of ownership status; all institutes: scientific and research and development), while data on the R&D activity of business enterprises are collected on the basis of registered activity and final accounts (shown investments in science in the statistical annex AOP 9091). Also, the report of the Tax Administration on the adopted decisions on tax benefits for business entities that had investments in scientific research or innovative activities is used. All data on the number of research organizations and employees refer to the situation on December 31 of the respective year, while the data on research works, income and expenses refer to the entire year.

The methodology for conducting survey is aligned with international standards set by the OECD and published in the Frascati manual (The Measurement of Scientific and Technological Activities - Proposed Standard Practice for Surveys of Research and Experimental Development - Frascati Manual).

Definitions of basic features

Science is a set of systematised and argument-based knowledge, i.e. facts, concepts, principles, data, information, theories, laws and patterns in a selected historical period about objective reality, i.e. nature and society, obtained through the application of objective scientific methods, and which main purpose and objective is to apprehend the laws and patterns about the past, the present and future of natural and social phenomena, as well as to improve efficient work in all fields of human activities.

Scientific research is theoretical or experimental work undertaken for acquiring new scientific knowledge and increasing human stock of knowledge. Scientific research implies basic and applied research.

Basic research implies research that increases the general stock of scientific facts and knowledge, and determines new fields of human knowledge and perception, but not involving or not necessarily involving any direct application of the obtained results.

Applied research is a theoretical or experimental work undertaken in order to acquire new knowledge, and directed towards resolving any practical task, i.e. achieving any practical objective.

Experimental (development) research is systematic work, based on knowledge acquired through basic or applied research, i.e. practical experience, which is primarily directed towards introducing new processes, products and services.

Scientific development work is a systematic activity which, through the application of scientific methods, brings new scientific knowledge, i.e. uses creatively existing knowledge for new applications. This is creative work on acquiring new knowledge, which is aimed to raise the general civilization level of society and touse that knowledge in all fields of socio-economic development.

Expenditure on research and development by types are divided into current costs and capital expenditures.

Current costs include: labour costs; other R&D employees' remuneration costs, other current costs (material costs for R&D work – raw materials, supplies, energy; payments based on work by contract and work for hire; daily allowances, travel costs, representation, etc).

Capital expenditures include expenditures on land and buildings; machines and equipments; patents, licences, studies and projects; software and hardware (implying total expenditures related to the purchase of computers, devices, systems, components and equipment, as well as purchase costs or costs for software development for own account), and other expenditures.

Non-financial (business) sector includes business entities and organizations which primary activity is the market production of goods and services and theirs ale at economically significant prices, as well as R&D incorporated units.

Tertiary education includes higher schools and universities within corporate units, faculties, academies and R&D institutes, whatever the sources of finance and legal status. This sector covers also research institutes and clinics under the direct control or administration of a tertiary education organisation.

Government sector includes organisations, offices and other bodies, except tertiary education, furnishing to the community free common services which could not be provided under market conditions, and which reflect the economic and social policy of the society; by definition this sector covers the activities of the administration, defence and public order enforcement; health, education, culture, recreation and other social services.

Non-profit sector includes non-market private non-profit organisations serving households without charging or at a low price. Those organisations may be founded by citizens' associations, for providing goods and services to the members or for general purposes.

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