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Statistics of science, technology and innovation

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Research and development activity, 2023

– Research and development –

Total expenditures for research and development activities (R&D) in 2023 amounted to over RSD 77 billion RSD (77,433,812 in thousands), and their participation in GDP amounts 0,95%.

In total expenditures for R&D, the share of gross investments is 16%, while the share of current expenditures is 84%.

In the total number of organizations engaged in research and development activities, the business sector participated with 62%, higher education with 24%, the government sector with 13%, and the non-profit sector with less than 1%.

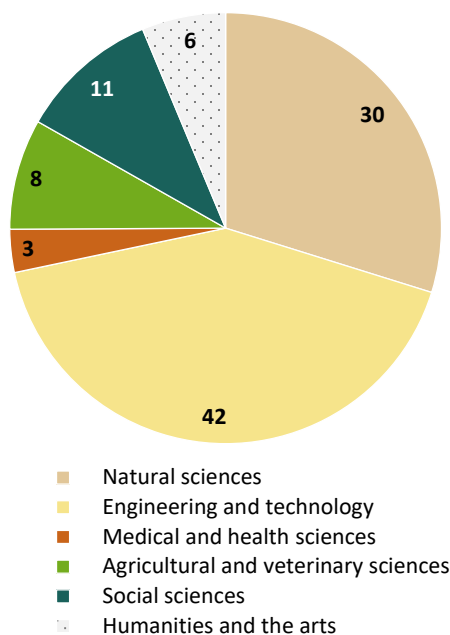
In 2023, there were 27,078 persons employed in this activity, of which 18,417 persons are researchers. In the total number of employees, the participation of women is 53%. The participation of researchers employed in NIRD increased by 5% compared to the previous year and their participation in the total number of employees is around 68%.

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

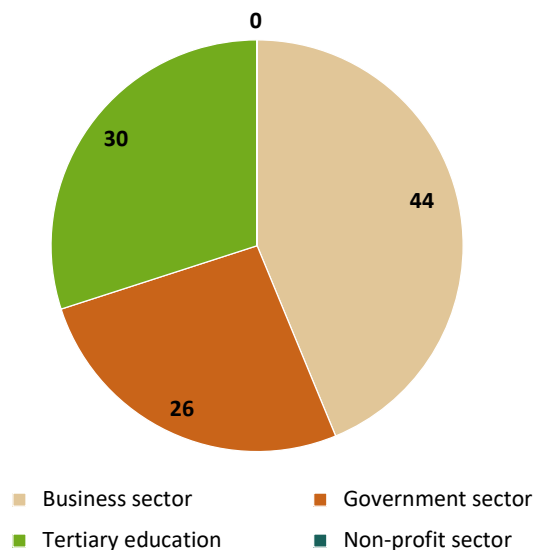
(in thousands of dinars)

	Gross domestic expenditure	Gross investments	Current costs		
			Total	Gross salaries	Material costs
REPUBLIC OF SERBIA	77433812	12476737	64957075	47609047	17348028
Natural sciences	22773241	834434	21938807	15805277	6133530
Engineering and technology	32607738	10760125	21847613	15862718	5984895
Medical and health sciences	2518150	78060	2440090	1455311	984779
Agricultural and veterinary sciences	6468986	335913	6133073	4788880	1344193
Social sciences	8174579	301576	7873003	5766993	2106010
Humanities and the arts	4891118	166629	4724489	3929868	794621
Business sector	33671839	10730264	22941575	17837754	5103821
Government sector	20426522	801558	19624964	14948723	4676241
Tertiary education	23333610	944915	22388695	14822228	7566467
Non-profit sector	1841	-	1841	342	1499

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



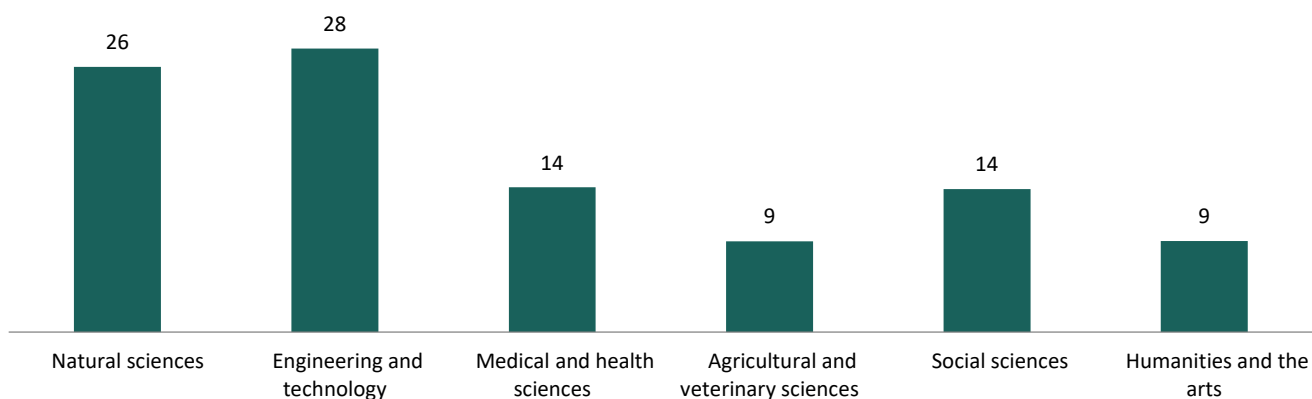
Graph 2. Gross domestic expenditures for research and development by sectors, %



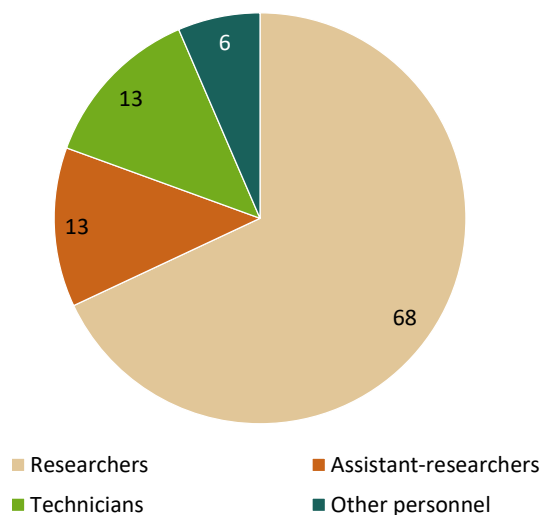
T2. Employees engaged in R&D activities by sectors, fields of science and sex

	Total		Researchers		Assistant-researchers		Technicians		Other personnel	
	All	Women	All	Women	All	Women	All	Women	All	Women
REPUBLIC OF SERBIA	27078	14299	18417	9849	3398	1635	3514	1782	1749	1033
Natural sciences	7097	3762	4973	2782	907	404	820	345	397	231
Engineering and technology	7587	3146	4446	1864	1454	557	1298	518	389	207
Medical and health sciences	3873	2417	3138	1877	221	151	336	269	178	120
Agricultural and veterinary sciences	2430	1330	1231	683	185	97	510	279	504	271
Social sciences	3824	2132	2842	1474	381	253	409	273	192	132
Humanities and the arts	2267	1512	1787	1169	250	173	141	98	89	72
Business sector	5435	1960	2226	831	1847	661	1076	349	286	119
Government sector	6173	3590	3807	2345	370	194	1221	613	775	438
Tertiary education	15468	8747	12382	6671	1181	780	1217	820	688	476
Non-profit sector	2	2	2	2	-	-	-	-	-	-

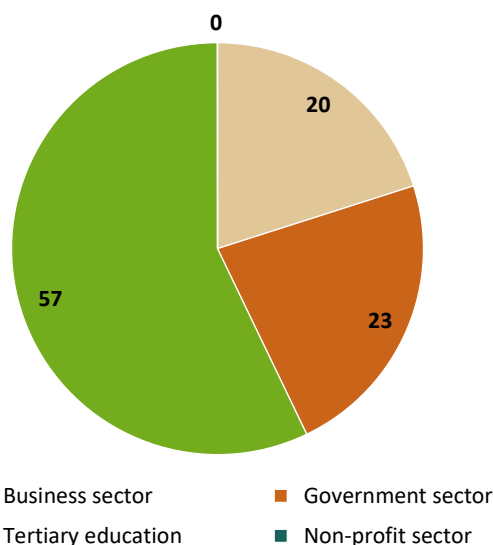
Graph 3. Employees engaged in R&D activities by fields of science, %



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



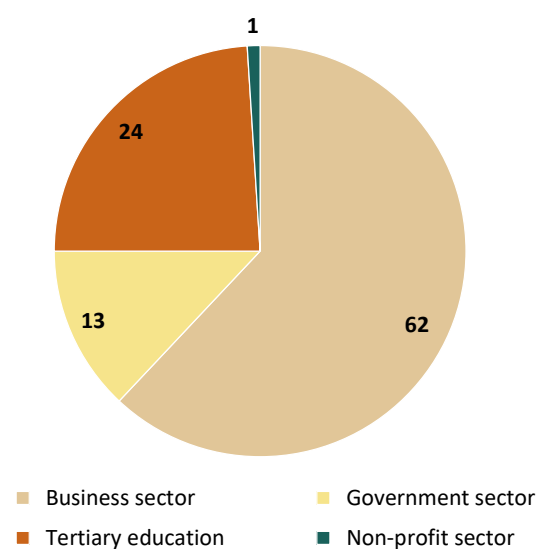
Graph 5. Employees engaged in R&D activities by sectors, %



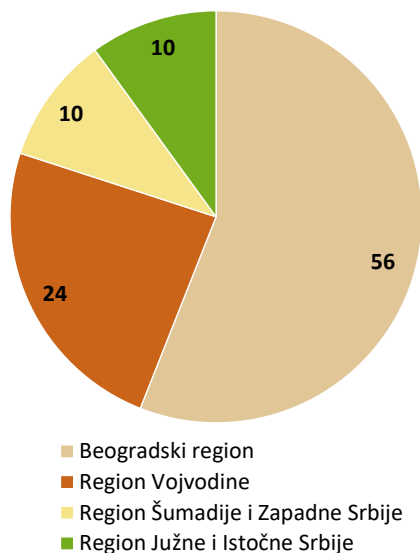
T3. R&D organizations by sectors and by regions

	Total	Business sector	Government sector	Tertiary education	Non-profit sector
REPUBLIC OF SERBIA	459	286	61	110	2
Beogradski region	258	148	51	58	1
Region Vojvodine	111	83	6	21	1
Region Šumadije i Zapadne Srbije	47	29	2	16	-
Region Južne i Istočne Srbije	43	26	2	15	-
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 2023. 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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