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Research and development activity, 2021

– Research and development –

Total expenditures for research and development activities (R&D) in 2021 amounted to over RSD 62 billion RSD (62,330,472 in thousands), and their participation in GDP amounts to almost 1% (0.99%), which represents an increase of 8 percentage points compared to the previous year.

In total expenditures for R&D, the share of gross investments is 7%, which represents an increase of 2% compared to the previous year, while the share of current expenditures is 93%.

In the total number of organizations engaged in research and development activities, the business sector participated with 52%, higher education with 31%, the government sector with 16%, and the non-profit sector with 1%.

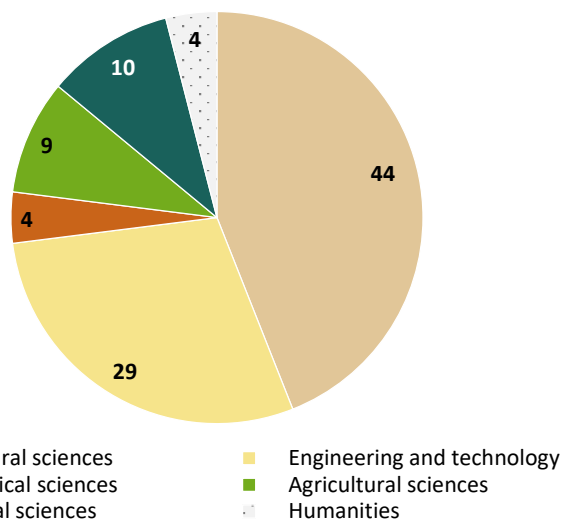
In 2021, there were 23,977 persons employed in this activity, of which 16,962 persons are researchers. The participation of women is 52%, while the participation of researchers in the total number of employees is around 71%. The participation of researchers employed in NIRD increased by 2% compared to the previous year.

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

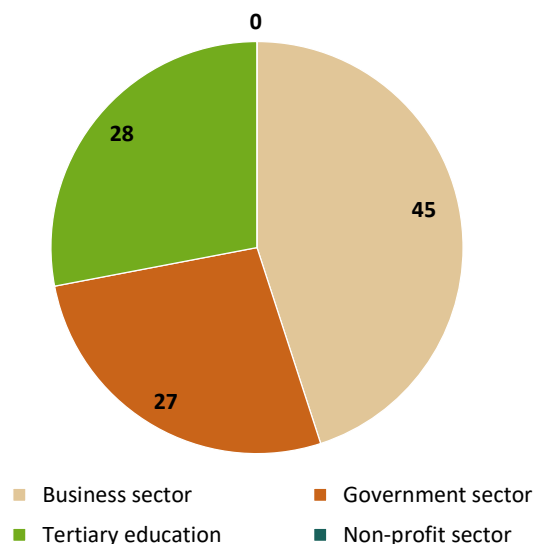
(in thousands of dinars)

	Gross domestic expenditure	Gross investments	Current costs		
			Total	Gross salaries	Material costs
REPUBLIC OF SERBIA	62330472	4241825	58088647	31764092	26324555
Natural sciences	27475209	2491270	24983939	10848401	14135538
Engineering and technology	18014261	1076145	16938116	8926147	8011969
Medical sciences	2187112	181446	2005666	1280212	725454
Agricultural sciences	5690088	253293	5436795	4488740	948055
Social sciences	6518040	189127	6328913	4437960	1890953
Humanities	2445762	50544	2395218	1782632	612586
Business sector	28148519	2374346	25774173	9295217	16478956
Government sector	16571256	1131258	15439998	11822653	3617345
Tertiary education	17607711	736221	16871490	10645040	6226450
Non-profit sector	2986	-	2986	1182	1804

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



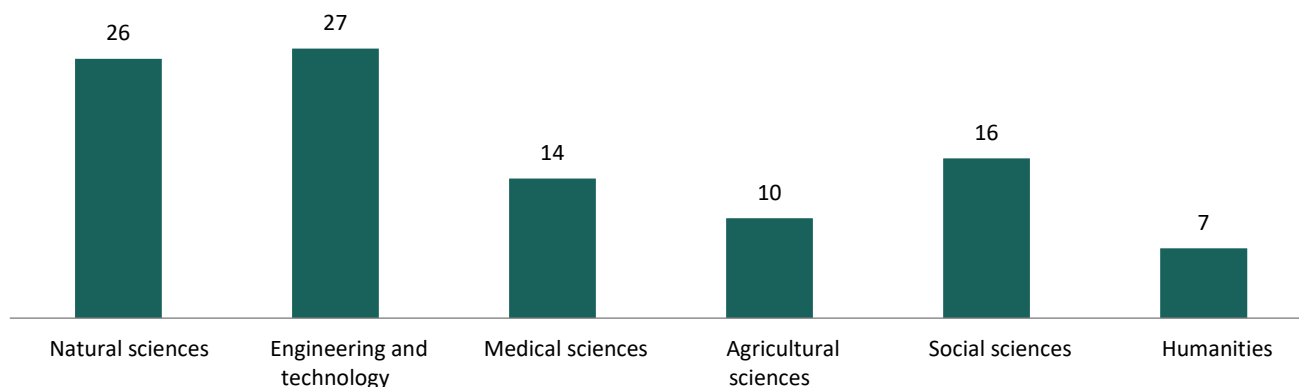
Graph 2. Gross domestic expenditures for research and development by sectors, %



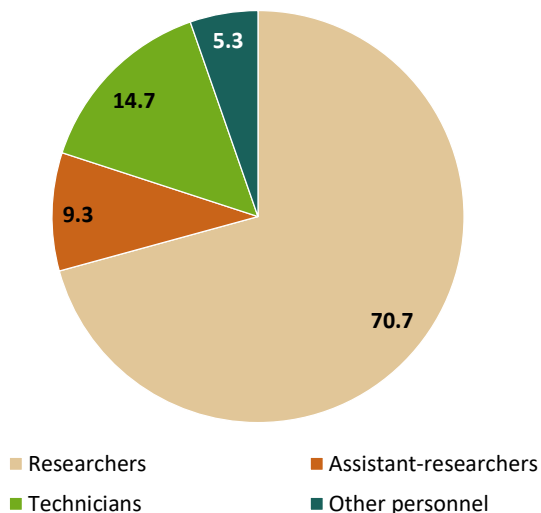
T2. Employees engaged in R&D activities by sectors, fields of science and sex

	Total		Researchers		Assistant-researchers		Technicians		Other personnel	
	All	Women	All	Women	All	Women	All	Women	All	Women
REPUBLIC OF SERBIA	23977	12488	16962	8875	2223	1136	3514	1828	1278	649
Natural sciences	6318	3367	4222	2380	935	406	894	445	267	136
Engineering and technology	6463	2646	4465	1820	454	180	1217	472	327	174
Medical sciences	3348	2029	2850	1684	201	147	262	184	35	14
Agricultural sciences	2425	1283	1180	652	175	85	537	296	533	250
Social sciences	3694	2043	2877	1495	281	191	453	311	83	46
Humanities	1729	1120	1368	844	177	127	151	120	33	29
Business sector	3735	1297	1755	651	802	260	913	284	265	102
Government sector	5724	3284	3453	2132	300	148	1321	691	650	313
Tertiary education	14510	7901	11746	6086	1121	728	1280	853	363	234
Non-profit sector	8	6	8	6	-	-	-	-	-	-

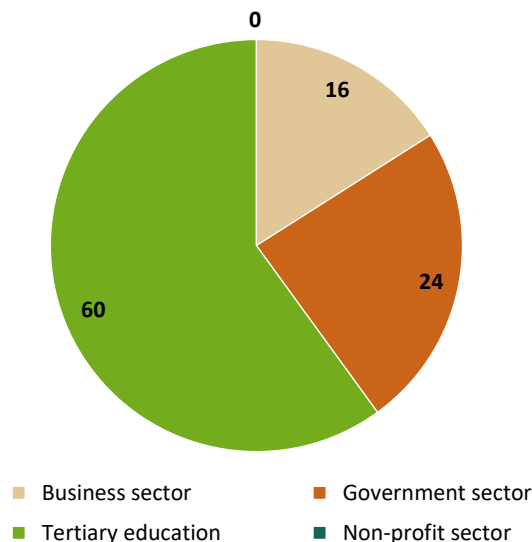
Graph 3. Employees engaged in R&D activities by fields of science, %



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



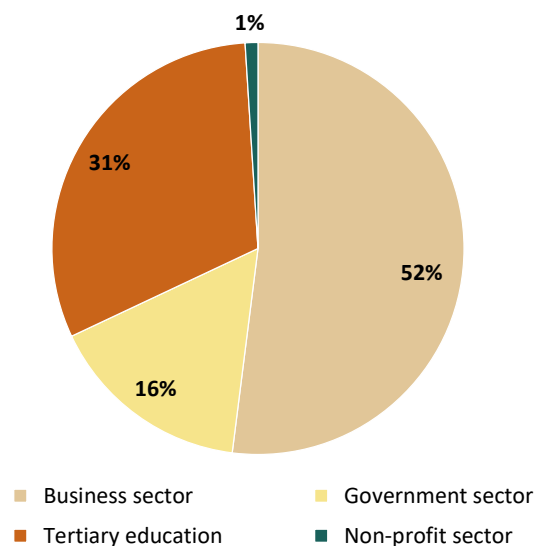
Graph 5. Employees engaged in R&D activities by sectors, %



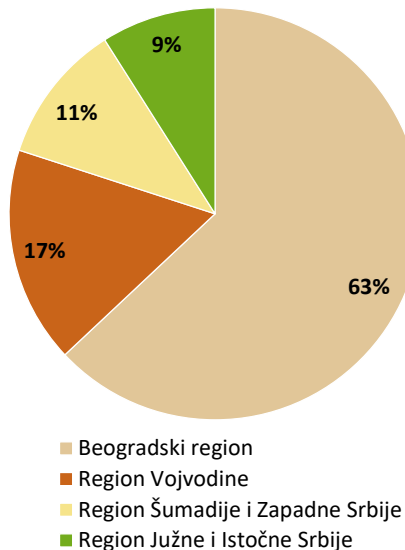
T3. R&D organizations by sectors and by regions

	Total	Business sector	Government sector	Tertiary education	Non-profit sector
REPUBLIC OF SERBIA	361	187	59	112	3
Beogradski region	229	120	49	58	2
Region Vojvodine	60	31	5	23	1
Region Šumadije i Zapadne Srbije	40	21	3	16	-
Region Južne i Istočne Srbije	32	15	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 2021. 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 9061). 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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