



**Palestinian National Authority  
Palestinian Central Bureau of Statistics**

**Press Release  
on the Main Findings of Research and Development  
Statistics, 2009**

**November, 2010**

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## **Preface**

Since its establishment in 1993, the Palestinian Central Bureau of Statistics (PCBS) has strived to provide basic official statistics to Palestinian enterprises and the public at large on most aspects of the Palestinian life in the West Bank and Gaza Strip.

Research and Development (R&D) plays an important role in permeating and spreading knowledge and culture. Within the frame of PCBS efforts in providing official Palestinian Statistics and to meet the demands of users, PCBS started the collection of statistics on Research and Development annually through a system of Administrative Records.

Data presented in this press release include many indicators relevant to many subjects related to R&D personnel, researchers, fields of sciences, expenditures on R&D services, type of researches, sources of funds, and the output of R&D.

PCBS hopes that this press release will enable planners and decision makers to carry out their duties in promoting the R&D sector in the Palestinian Territory; and enlighten decision and policy makers engaged in the comprehensive national development process in the country.

**November, 2010**

**Ola Awad**  
**Acting President**



## **Note For Users**

- Some indicators were estimated on the basis of previous rates such as spending on research and development for enterprises that did not respond to such questions, in addition to checking the consistency and logical basis of the number of the organizations of similar size and activity.
- The figures for Gaza Strip were estimated based on the study done by the Applied Research Institute (ARIJ) 2009, entitled (Survey of Scientific Research in Palestine, 2009).
- Consultations and studies are considered as in this press release as part of R&D activities.
- Data represent the completed interview enterprises.



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## **Preliminary Results on Research and Development Statistics in the West Bank, 2009**

- **The number of researchers was 1,550.**
- **Studies and consultations represent 66.3% of research and development activities.**
- **The total expenditure on research and development was US\$ 28.8 million.**

For the third time, PCBS implemented data collection on research and development through administrative records of research and development enterprises. Data represent the enterprises in the West Bank only.

The total number of interviewed enterprises reached 71 of which 24 enterprises the result of interview was distributed (19 governmental enterprises out of 24 did not work during the reference period, and 5 enterprises refused to cooperate in the survey or the collected data was incomplete). The number of completed interviews reached 47 enterprises. The findings below represent only the enterprises with completed data that was collected during the third quarter of 2009. The data cover human resources in research and development, types of research and their purposes, the amount spent on each type of research, sources of funding and the most important achievements, such as the number of patents and research published locally and internationally.

The most important findings were as follows:

### **R&D Personnel**

Data showed that the number of employees in research and development reached 2,951 workers, representing 1,167 full-time equivalent (FTE) workers in 2009, compared with 1,542 workers, representing 669 FTE workers in 2008. The number of researchers reached 1,550 which represent 569 FTE researchers in 2009, compared with 992 researchers representing 363 FTE researchers in 2008. The number of researchers was 232 FTE researchers per million inhabitants in 2009, compared with 150 FTE researchers per million inhabitants in 2008. The total number of male researchers was 1,259 researchers in 2009, compared with 765 researchers in 2008 and the number of female researchers was 291 in 2009, compared with 227 researchers in 2008.

### **R&D outputs**

Major outputs of research and development in 2009 were as follows: 21 local and international awards, 251 studies published in journals, 485 studies published in local magazines, 55 International Standard Book Numbers (ISBN), and 26 citation indexes. Research was distributed by type of research as follows: 66.3% studies and consultations, 14.2% basic research, 13.6% applied research, and 5.9% experimental research.

### **Expenditure on R&D**

The total expenditure on research and development was US\$ 28.8 million, representing 51,000 US\$ for each FTE researcher. The expenditure share of governmental sector in R&D expenditure was 34.2% of the total expenditure, the share of non governmental organizations in R&D expenditure was 17.5% of the total expenditure, and the share of on higher education in R&D expenditure was 48.3% of the total expenditure on R&D.

## Concepts and Definitions

### **Citation Index:**

Is a reference to a book, article, web page, or other published item with sufficient detail to identify the item uniquely. Unpublished writings or speech, such as working papers and personal communications, are also sometimes cited.

### **Fields of Science:**

Following the International Standardization of Statistics on Science And Technology Manual (UNESCO,1978) and Frascati Manual (OECD,2002), the following are the fields of science:

**Natural Sciences:** Include Mathematics and Computer Sciences, Physical Sciences, Chemical Sciences, Earth and related Environmental Sciences and Biological Sciences.

**Engineering and Technology:** Include Civil Engineering, Electrical Engineering, Electronics, and other Engineering Sciences.

**Medical Sciences:** Include Basic Medicine, Clinical Medicine, and Health Sciences

**Agricultural Sciences:** Include Agriculture, Forestry, Fisheries and Allied Sciences, and Veterinary Medicine.

**Social Sciences:** Include Psychology, Economics, Educational Sciences, and other Social Sciences.

**Humanities: Include History, Languages and Literature, and other Humanities.**

### **Full-Time Equivalent (FTE):**

Percentage of the time a person spent throughout the year on Research and Experimental Development. Thus, a person who normally spends 30.0% of his/her time on R&D and the rest on other activities (such as teaching, university administration and student counseling) should be considered as 30.0% FTE. Similarly, if a full-time R&D worker is employed at an R&D unit for only six months, this results in an FTE of 50.0%. For reporting purposes, the total sum of FTEs should be rounded to the next integer, avoiding the reporting of decimals.

### **International Standard Book Number (ISBN):**

Is the particular number given to each book to be identified through the publishers, address, number and date of printing and gives the figure for all books, regardless of their place of publication, a figure that is not changed, to be known as one of the headline writers and one by the publisher one. ISBN figure consists of ten digits preceded by the letters ISBN fields and farms are spread in four groups separated by (-).

### **R&D Expenditures:**

All expenditures of R&D during specified period of time, which is full year .R&D expenditures constitute:

**Current Expenditures:** Include (Labour costs – annual wages and salaries and all associated costs of researchers, technicians and supporting staff and other current costs, such as non-capital purchases of materials, supplies and R&D equipment i.e. water, fuel, gas, electricity; books, journals, reference materials, subscriptions to libraries, scientific societies; materials for laboratories).

**Capital Expenditures:** Include (Maintenance and repair Buildings, Constructions, Appliances and Equipment, Office Furniture, and Other capital expenditure).

### **Research and Experimental Development (R&D):**

Comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of

knowledge to devise new applications. The term R&D covers three activities: basic research, applied research and experimental development:

**Basic Research:** Is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

**Applied Research:** Is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

**Experimental Development:** Is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

**Studies and Consultations:**

They are considered as part of R&D and activities, number of studies and consultations, the staff and expenditures are included in this report.

**R&D Personnel:**

All persons employed directly on R&D, and persons providing an indirect service, such as General service employees and Skilled craftsmen, should they can be classification as follow:

**Administrators:** Persons engaged in the management and administration of a business, such as Managers, Accountants, Secretarial jobs.

**Researchers:** Professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned. Postgraduate students at the PhD level (ISCED level 6) engaged in R&D should be considered as researchers.

**Technicians and Equivalent:** Persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences (Technicians) or social sciences and humanities (Equivalent staff). They participate in R&D by performing scientific and technical tasks involving the application of concepts and operational methods, normally under the supervision of researchers.

**Other Supporting Staff:** Includes skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with (or providing services to researchers involved in) such projects.

**Reference Date:**

The date referred to in calculating all set of indicators in this survey is between 01/01/2009 to 31/12/2009.

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**Table 1: Main Indicators For Research and Development (R&D) in the West Bank by Selected Years**

Indicator	Year			
	2009	2008	2007	
Number of Enterprises Engaged in R&D that completed interview	*47	40	38	
Number of R&D Personnel	2,951	1,542	1,555	
Number of R&D Personnel with Full – Time Equivalent (FTE)	1,167	669	566	
Number of Researchers in R&D	1,550	992	981	
Number of Researchers (Males) in R&D	1,259	765	744	
Number of Researchers (Females) in R&D	291	227	237	
Number of Researchers in R&D with FTE	569	363	280	
Number of Researchers in R&D with FTE Per Million inhabitants	232	150	120	
Total Expenditure on R&D (million\$)	28.8	10.9	11.5	( )
Percentage of External Funds for R&D	26.3	40.3	50.4	
Expenditure on R&D Per Researcher with FTE (Thousands \$)	51	30	41	( )
Number of Researches, Studies, and Consultations	1,638	1,167	982	
Percentage of Studies and Consultations	66.3	54.1	49.8	
Percentage of Basic Research	14.2	19.9	25.8	( / )
Percentage of Applied Research	13.6	19.0	18.1	
Percentage of Experimental Development Researches	5.9	7.0	6.3	

\* An enterprise and its branches were treated as one unit, e.g. Birzeit university and its centers.

\* تم التعامل مع بعض المؤسسات وفروعها على أنها وحدة واحدة، مثل معاهد ومراكز جامعة بيرزيت.

2008

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Table 2: Main Indicators For Research and Development (R&amp;D) in the West Bank and Gaza Strip, 2008

Indicator	Year		
	*		
	2008	2008	
<b>Number of Enterprises Engaged in R&amp;D that completed interview</b>	16	40	
Number of R&D Personnel	917	1,542	
Number of Researchers in R&D	680	992	
Number of Researchers (Males) in R&D	618	765	
Number of Researchers (Females) in R&D	62	227	
Number of Researchers in R&D with FTE	279	363	
Number of Researchers in R&D with FTE Per Million inhabitants	194	150	
<b>Number of Researchers by Educational Attainment</b>			:
Secondary and Less	0	0	
Associate Diploma	9	3	
Bachelor	79	191	
Higher Diploma	0	2	
Master	176	406	
Ph.D.	416	390	
<b>Total</b>	<b>680</b>	<b>992</b>	
<b>Number of Researchers by Fields of Science</b>			:
Physical Sciences	163	99	
Engineering & Technology	59	161	
Medical Sciences	62	60	
Agricultural Sciences	30	43	
Social Sciences	139	256	
Humanities Sciences	227	373	
<b>Total</b>	<b>680</b>	<b>992</b>	

\* Source: Applied Research Institute (ARIJ), 2009. survey of Scientific Research in Palestine, 2009.

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2009

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**Table 3: Research and Development Personnel in the West Bank by occupation and Sex, 2009**

Sex	Total	Occupation			
		Others	Technicians	Researchers	Administrators
Males	2,147	189	282	1,259	417
Females	804	53	99	291	361
<b>Both Sexes</b>	<b>2,951</b>	<b>242</b>	<b>381</b>	<b>1,550</b>	<b>778</b>

2009

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**Table 4: Research And Development Personnel in the West Bank by Occupation and Full – Time Equivalent, 2009**

Full – Time Equivalent	Total	Occupation الوظيفة				معادل الوقت التام
		Others	Technicians	Researchers	Administrators	
Less than 10%	634	134	52	44	404	أقل من 10%
10% - 30%	1,123	15	91	963	54	10% - 30%
31% - 50%	264	19	6	207	32	31% - 50%
51% - 70%	177	1	9	64	103	51% - 70%
71% - 90%	112	27	29	41	15	71% - 90%
91% - 100%	641	46	194	231	170	91% - 100%
<b>Total</b>	<b>2,951</b>	<b>242</b>	<b>381</b>	<b>1,550</b>	<b>778</b>	

2009

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**Table 5: Research and Development Personnel in the West Bank by Occupation and Educational Attainment, 2009**

Educational Attainment	Total	Occupation				
		Others	Technicians	Researchers	Administrators	
Secondary and Less	274	202	24	0	48	
Associate Diploma	277	20	109	5	143	
Bachelor	834	16	206	253	359	
Higher Diploma	16	0	4	7	5	
Master	815	3	36	635	141	
Ph.D.	735	1	2	650	82	
<b>Total</b>	<b>2,951</b>	<b>242</b>	<b>381</b>	<b>1,550</b>	<b>778</b>	المجموع



2009

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**Table 6: Researchers in Research and Development in the West Bank by Fields of Science, 2009**

Field of Science	No. of Researchers	
Physical Sciences	237	
Engineering & Technology	161	
Medical Sciences	117	
Agricultural Sciences	59	
Social Sciences	417	
Humanities Sciences	559	
<b>Total</b>	<b>1,550</b>	

2009

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**Table 7: Research and Development Personnel in the West Bank by Sector of Employment and Sex, 2009**

Sector of Employment	Total	Sex		
		Females	Males	
Governmental	<b>499</b>	153	346	
Non Governmental Organizations	<b>367</b>	124	243	
Higher Education	<b>2,085</b>	527	1,558	
<b>Total</b>	<b>2,951</b>	<b>804</b>	<b>2,147</b>	

2009

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**Table 8: Research and Development Personnel in the West Bank by Sector of Employment and Occupation, 2009**

Sector of Employment	Total	Occupation				
		Others	Technicians	Researchers	Administrators	
Governmental	<b>499</b>	36	156	170	137	
Non Governmental Organizations	<b>367</b>	63	30	132	142	
Higher Education	<b>2,085</b>	143	195	1,248	499	
<b>Total</b>	<b>2,951</b>	<b>242</b>	<b>381</b>	<b>1,550</b>	<b>778</b>	المجموع

2009

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**Table 9: Percentage Distribution of Researches in the West Bank by Type, 2009**

Type of Research	Percentage	
Studies and Consultations	66.3	
Basic Researches	14.2	( / )
Applied Researches	13.6	
Experimental Development Researches	5.9	
<b>Total</b>	<b>100</b>	

2009

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**Table 10: Outputs of Research and Development in the West Bank by Type, 2009**

Outputs	Number	
National Prizes for Researchers and Inventors	8	
International Prizes for Researchers and Inventors	13	
Patents	0	
Publications in National Magazines	485	
Publications in Peer review Magazines	251	
National Researches	171	
International Researches	168	
International Standard Book Number (ISBN)	55	
Citation Index	26	

2009

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**Table 11: Value of Expenditure (1000 US\$) and Percentage Distribution on Research and Development in the West Bank by Sector of Employment, 2009**

Sector of Employment	Percentage	Value	
Governmental	34.2	<b>9,850</b>	
Non Governmental Organizations	17.5	<b>5,041</b>	
Higher Education	48.3	<b>13,931</b>	
<b>Total</b>	<b>100</b>	<b>28,822</b>	