



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

**Research and Development Statistics, 2008**

**Press Release on the Main Finding**

**November, 2009**



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## **Preface**

Since its establishment in 1993, the Palestinian Central Bureau of Statistics (PCBS) has been trying its best to provide basic official statistics to Palestinian officials and members of the public on most aspects of the Palestinian life in the West Bank and Gaza Strip.

Within the frame of PCBS efforts in providing official Palestinian Statistics, and because of spreading of Research and Development (R&D) phenomena, and the important role they play in permeating and spreading knowledge and culture, PCBS started collecting data on Research and Development annually through a system of Administrative Record.

Data presented in this report 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 report will enable planners and decision makers to carry out their duties of caring and 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, 2009**

**Ola Awad  
Acting President**



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## **PCBS Issues Preliminary Results on Research and Development Statistics in the West Bank, 2008**

- **The number of researchers was 992.**
- **Studies and consultations represent 54.1% of research and development activities.**
- **The total expenditure on research and development was US\$ 10.9 million.**

For the second time PCBS has implemented data collection on research and development through administrative records of research and development institutions. Data represent the institutions in the West Bank only.

The total number of institutions was 56 institutions, of which 12 institutions the interview results was (refused and incomplete) and 44 institutions that it's data was completed, with a response rate 78%, the findings below represent only the 44 completed institutions. Data were collected during the third quarter of 2009, and focused on 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 1,542 workers, representing 669 full-time equivalent workers in 2008, compared with 1,555 workers, representing 566 full-time equivalent workers in 2007.

The number of researchers was 992 which represent 363 full-time equivalent researchers in 2008, compared with 981 researchers representing 280 full-time equivalent researchers in 2007.

The number of researchers was 150 full-time equivalent researchers per million inhabitants in 2008, compared with 120 full-time equivalent researchers per million inhabitants in 2007. The total number of male researchers was 765 researchers in 2008, compared with 744 researchers in 2007 and the number of female researchers was 227 in 2008, compared with 237 researchers in 2007.

### **R&D outputs**

Major outputs of research and development in 2008 were as follows: 27 local and international awards, two patents, 389 studies published in journals, 315 studies published in local magazines, 697 studies and consultations, 86 International Standard Book Numbers (ISBN), and 3 citation indexes. Research was distributed by type of research as follows: 54.1% studies and consultations, 19.9% basic research, 19.0% applied research, and 7.0% experimental research.

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

The total expenditure on research and development was US\$ 10.9 million, representing US\$ 30,000 for each full-time equivalent researcher. Sources of funding for research and development was as follows: 40.3% direct funds from abroad, 32.0% self-financing, 13.8% from non-profit institutions, 5.7% from governmental institutions, 5.6% source of funding

was not stated, 2.1% from private institutions, and 0.5% from higher education institutions.

PCBS will organize a dialogue with producers and users of research and development indicators at the beginning of 2010 to discuss lessons learned and to make recommendations that contribute to the development of research and statistics. PCBS extends thanks and appreciation to all Palestinian institutions engaged in research and development, and to all employees who have contributed to the success of data collection.

*Data Collection/ processing of this document has been produced with financial assistance of the European Union. The contents of this document are the sole responsibility of the PCBS.*

## 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 (UNESCO,1978) and Frascati Manual (OECD,2002).

**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 number particular gives 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 for R&D specified period of time full year, including:

**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.

#### **R&D Personnel:**

Are 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 for the performance or management of administrative business operations, 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 01/01/2008 to 31/12/2008.

## **Tables**



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

| Indicator   | Year  |       |       |
|---|-------|-------|-------|
|   | 2008  | 2007  |       |
| Number of Enterprises Engaged in R&D that completed interview | 40    | 38    |       |
| Number of R&D Personnel                                       | 1,542 | 1,555 |       |
| Number of R&D Personnel with Full – Time Equivalent FTE       | 669   | 566   |       |
| Number of Researchers in R&D                                  | 992   | 981   |       |
| Number of Researchers (Males) in R&D                          | 765   | 744   |       |
| Number of Researchers (Females) in R&D                        | 227   | 237   |       |
| Number of Researchers in R&D with FTE                         | 363   | 280   |       |
| Number of Researchers in R&D with FTE Per Million inhabitants | 150   | 120   |       |
| Total Expenditure on R&D (million\$)                          | 10.9  | 11.5  | ( )   |
| Percentage of External Funds for R&D                          | 40.3  | 50.4  |       |
| Expenditure on R&D Per Researcher with FTE (Thousands \$)     | 30    | 41    | ( )   |
| Number of Researches, Studies, and Consultations              | 1,167 | 982   | :     |
| Percentage of Studies and Consultations                       | 54.1  | 46.1  |       |
| Percentage of Basic Research                                  | 19.9  | 25.8  | ( / ) |
| Percentage of Applied Research                                | 19.0  | 18.1  |       |
| Percentage of Experimental Development Researches             | 7.0   | 6.3   |       |
| Percentage of Other Researches and Studies                    | 0.0   | 3.7   |       |

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**Table 2: Research and Development Personnel in the West Bank by occupation and Sex, 2008**

| Sex               | Total        | Occupation |             |             |                |
|-------------------|--------------|------------|-------------|-------------|----------------|
|                   |              | Others     | Technicians | Researchers | Administrators |
| Males             | 1,105        | 60         | 130         | 765         | 150            |
| Females           | 437          | 36         | 61          | 227         | 113            |
| <b>Both Sexes</b> | <b>1,542</b> | <b>96</b>  | <b>191</b>  | <b>992</b>  | <b>263</b>     |

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**Table 3: Research And Development Personnel in the West Bank by Occupation and Full – Time Equivalent, 2008**

| Full – Time Equivalent | Total        | Occupation |             |             |                |            |
|------------------------|--------------|------------|-------------|-------------|----------------|------------|
|                        |              | Others     | Technicians | Researchers | Administrators |            |
| Less than 10%          | 181          | 17         | 61          | 83          | 20             | أقل من 10% |
| 10% - 30%              | 573          | 22         | 9           | 501         | 41             | 10% - 30%  |
| 31% - 50%              | 241          | 12         | 5           | 206         | 18             | 31% - 50%  |
| 51% - 70%              | 147          | 6          | 10          | 35          | 96             | 51% - 70%  |
| 71% - 90%              | 132          | 27         | 75          | 13          | 17             | 71% - 90%  |
| 91% - 100%             | 268          | 12         | 31          | 154         | 71             | 91% - 100% |
| <b>Grand Total</b>     | <b>1,542</b> | <b>96</b>  | <b>191</b>  | <b>992</b>  | <b>263</b>     |            |

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**Table 4: Research and Development Personnel in the West Bank by Occupation and Educational Attainment, 2008**

| Educational Attainment | Total        | Occupation |             |             |                |               |
|------------------------|--------------|------------|-------------|-------------|----------------|---------------|
|                        |              | Others     | Technicians | Researchers | Administrators |               |
| Secondary and Less     | 75           | 68         | 1           | 0           | 6              |               |
| Associate Diploma      | 98           | 8          | 37          | 3           | 50             |               |
| Bachelor               | 430          | 19         | 105         | 191         | 115            |               |
| Higher Diploma         | 12           | 0          | 4           | 2           | 6              |               |
| Master                 | 496          | 1          | 42          | 406         | 47             |               |
| Ph.D                   | 431          | 0          | 2           | 390         | 39             |               |
| <b>Grand Total</b>     | <b>1,542</b> | <b>96</b>  | <b>191</b>  | <b>992</b>  | <b>263</b>     | المجموع الكلي |



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**Table 5: Researchers in Research and Development in the West Bank by Fields of Science, 2008**

| Fields of Science        | No. of Researchers |  |
|--------------------------|--------------------|--|
| Physical Sciences        | 99                 |  |
| Engineering & Technology | 161                |  |
| Medical Sciences         | 60                 |  |
| Agricultural Sciences    | 43                 |  |
| Social Sciences          | 256                |  |
| Humanities Sciences      | 373                |  |
| <b>Total</b>             | <b>992</b>         |  |

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**Table 6: Research and Development Personnel in the West Bank by Sector of Employment and Sex, 2008**

| Sector of Employment           | Total        | Sex        |              |  |
|--------------------------------|--------------|------------|--------------|--|
|                                |              | Females    | Males        |  |
| Private                        | <b>328</b>   | 115        | 213          |  |
| Non Governmental Organizations | <b>323</b>   | 131        | 192          |  |
| Higher Education               | <b>891</b>   | 191        | 700          |  |
| <b>Grand Total</b>             | <b>1,542</b> | <b>437</b> | <b>1,105</b> |  |

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**Table 7: Research and Development Personnel in the West Bank by Sector of Employment and Occupation, 2008**

| Sector of Employment           | Total        | Occupation |             |             |                |               |
|--------------------------------|--------------|------------|-------------|-------------|----------------|---------------|
|                                |              | Others     | Technicians | Researchers | Administrators |               |
| Private                        | <b>328</b>   | 1          | 62          | 236         | 29             |               |
| Non Governmental Organizations | <b>323</b>   | 31         | 66          | 141         | 85             |               |
| Higher Education               | <b>891</b>   | 64         | 63          | 615         | 149            |               |
| <b>Grand Total</b>             | <b>1,542</b> | <b>96</b>  | <b>191</b>  | <b>992</b>  | <b>263</b>     | المجموع الكلي |

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**Table 8: Percentage Distribution of Researches in the West Bank by Type, 2008**

| Type of Research                    | Percentage |       |
|-------------------------------------|------------|-------|
| Basic Researches                    | 19.9       | ( / ) |
| Applied Researches                  | 19.0       |       |
| Experimental Development Researches | 7.0        |       |
| Studies and Consultations           | 54.1       |       |
| <b>Total</b>                        | <b>100</b> |       |

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**Table 9: Outputs of Research and Development in the West Bank by Type, 2008**

| Outputs  | Number |  |
|--|--------|--|
| National Prizes for Researchers and Inventors      | 25     |  |
| International Prizes for Researchers and Inventors | 12     |  |
| Patents  | 2      |  |
| Publications in National Magazines                 | 315    |  |
| Publications in Peer review Magazines              | 389    |  |
| National Researches                                | 159    |  |
| International Researches                           | 178    |  |
| Studies and Consultations                          | 697    |  |
| International Standard Book Number (ISBN)          | 86     |  |
| Citation Index                                     | 3      |  |

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**Table 10: Percentage Distribution of Total Expenditure on Research and Development in the West Bank by Sources of Fund, 2008**

| Sources of Fund                 | Percentage |  |
|---------------------------------|------------|--|
| Higher Education Establishments | 0.5        |  |
| Government Establishments       | 5.7        |  |
| Non – Profit Establishments     | 13.8       |  |
| Private Establishments          | 2.1        |  |
| Fund From Abroad                | 40.3       |  |
| Self Fund                       | 32.0       |  |
| Not stated                      | 5.6        |  |
| <b>Total</b>                    | <b>100</b> |  |

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**Table 11: Percentage Distribution of the Total Expenditure (US\$) on Research and Development in the West Bank by Type of Expenditure, 2008**

| Type of Expenditure  | Percentage  | Value             |  |
|--|-------------|-------------------|--|
| <b>Current Expenditures</b>  | <b>83.4</b> | <b>9,091,796</b>  |  |
| Wages and Salaries   | 51.6        | 5,625,282         |  |
| Goods and Services   | 31.8        | 3,466,514         |  |
| <b>Capital Expenditures</b>  | <b>16.6</b> | <b>1,811,254</b>  |  |
| Maintenance of Buildings, Machines, Equipments, and Other Capital Expenditures | 16.6        | 1,811,254         |  |
| <b>Total</b>   | <b>100</b>  | <b>10,903,050</b> |  |