**Pakistan Council for Science and Technology**

**Ministry of Science and Technology**

Shahrah-e-Jamhuriat, Sector G-5/2, Islamabad-44000

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Mapping Nanotechnology Research Activities in Pakistan

# Section 1: *Basic Information*

1. Name of Organization / University / Institute: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Name of Department / Division / Laboratory: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Postal Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Web-site (if any): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Official E-mail: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Main Objectives / mandate:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Year of Establishment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Details of Person who is providing this information:

 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Designation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Telephone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Fax: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ E-Mail: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What percentage (estimate) of the total research activities of your organization / department / institute can be categorized as “**Nanotechnology research**”?
2. 91-100% vi. 41-50%
3. 81-90% vii. 31-40%
4. 71-80% viii. 21-30%
5. 61-70% ix. 11-20%
6. 51-60% x. 01-10%
7. What percentage (estimate) of research activities of your organization / department / institution relate to the following fields of **Nanotechnology**?
8. Electronics Nanotechnology
9. Medicine Nanotechnology
10. Environmental Nanotechnology
11. Textile Nanotechnology
12. Food Nanotechnology
13. Bio-nanotechnology
14. Nano-informatics
15. Other (please specify)

# Section 2: Input Parameters

## 10. Human Resources (only who are engaged in Nanotechnology Research)

## a. No. of current R&D Researchers / Faculty members:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gender** | **PhD** | **MPhil/****MSc(Hons)** | **MSc** | **B.Sc(Hons)/ B.E.** | **Total** |
| Male |  |  |  |  |  |
| Female |  |  |  |  |  |

**b.** Please provide information about all the Researchers / Faculty members (who are engaged in Nanotechnology Research) on the following format (attach extra sheet, if required)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sr.No.** | **Name** | **Highest Qualification** | **Year of Obtaining Degree** | **Title of Thesis** | **Major Field of Study** | **University** |
| 1. |  |  |  |  |  |  |
| 2. |  |  |  |  |  |  |
| 3. |  |  |  |  |  |  |
| 4. |  |  |  |  |  |  |
| 5. |  |  |  |  |  |  |

**c.** Technicians and Supporting Staff attached on full time or part time basis with Researchers / Faculty members, who are engaged in Nanotechnology Research:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gender** | **Technicians or equivalent staff** | **Other supporting staff** | **Not specified** | **Total** |
| Male |  |  |  |  |
| Female |  |  |  |  |

11. R&D Expenditure for the Year 2017-18 Rs. in million

|  |  |  |
| --- | --- | --- |
| **Type of Expenditure** | **Total** | **Nanotechnology Research related Expenditure** |
| Non-development / recurring Expenditure |  |  |
| Development Expenditure |  |  |
| **Total** |  |  |

### 12. Major Scientific Equipment available in the organization / department / institute along-with location (of value above Rs.1.00 million) (please fill separate table for each laboratory)

|  |  |
| --- | --- |
| Name of Division |  |
| Name of the Department |  |
| Name of Laboratory (in case more than one labs, Lab1, Lab2, Lab3, …) |  |
| Research activity |  |

**Details of Equipment in Lab** (please also mention name of Laboratory here) (attach extra sheet, if required)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name of Equipment** | **Quantity** | **Make / Model** | **Year of Installation** | **Cost** | **\*F/\*\*NF** |
|  |  |  |  |  |  |
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\*F= Functional \*\*NF= Non-functional

# Section 3: Outputs Parameters

## 13. R&D Output

 **(a)** Details of Patents / Products / Processes (Please provide complete information during F.Y. ***2010-11 to 2017-18***):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Title of Patent** | **Applied** | **Granted** | **\*Commercialized** |
| **Local** | **International** | **Local** | **International** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Title** | **Varieties / Prob / Vector Developed** | **Processes & Products Improved / Developed** | **\*Commercialized** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
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|  |  |  |  |  |

***\*If commercialized, please provide proof of commercialization of patent / variety / process / product related to Nanotechnology.***

**(b)** No. of Students awarded degree F.Y. 2010-11 to 2017-18 (attach extra sheet, if required):

|  |  |  |
| --- | --- | --- |
| **Year** | **No. of Students** | **Total** |
| **BSc (Hons)** | **MSc** | **MPhil / MSc(Hons)** | **PhD** |
|  |  |  |  |  |  |
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**(c)** Publications (please provide details)

**Publications in Impact Factor (IF) Journals**

Total No. of Publications in IF Journals:\_\_\_\_\_\_\_\_\_\_(F.Y. *2010-11 to 2017-18)*

No. of Publications in IF Journals related to Nanotechnology: \_\_\_\_\_\_\_\_\_\_ (F.Y. *2010-11 to 2017-18)*

**i.** Details of Publications in Impact Factor Journals F.Y. ***2010-11 to 2017-18*** (attach extra sheet, if required)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year**  | **Name of Author(s)** | **Paper title** | **Journals Name**  | **Volume** | **Research or Review Paper** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
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**Publications in Non Impact Factor (NIF) Journals**

Total No. of Publications in NIF Journals: \_\_\_\_\_\_\_\_\_\_ (F.Y. *2010-11 to 2017-18)*

No. of Publications in NIF Journals related to Nanotechnology: \_\_\_\_\_\_\_\_\_\_(F.Y. *2010-11 to 2017-18)*

**ii.** Publications in Non Impact Factor Journals F.Y. ***2010-11 to 2017-18*** (attach extra sheet, if required)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year**  | **Name of Author(s)** | **Paper title** | **Journals Name**  | **Volume** | **Research or Review Paper** |
|  |  |  |  |  |  |
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**(d)** Details of research projects related to Nanotechnology

**Completed Projects:**

1. **a)** Projects completed sponsored by the Government of Pakistan F.Y. ***2010-11 to 2017-18*** (attach extra sheet, if required)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Project title** | **Duration** | **Total cost** **(Rs. in million)** | **Funding Agency** | **Brief Outcomes of the Project** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Ongoing Projects:**

**b**) Ongoing Projects sponsored by the Government of Pakistan (attach extra sheet, if required)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Project title** | **Duration** | **Total cost** **(Rs. in million)** | **Funding Agency** |
|  |  |  |  |  |
|  |  |  |  |  |
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|  |  |  |  |  |

1. Details of International Competitive Grants achieved (related to Nanotechnology)

**Completed Projects:**

1. Projects completed securing International competitive grants F.Y. ***2010-11 to 2017-18*** (attach extra sheet, if required)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Project title** | **Duration** | **Total cost** **(USD in million)** | **Funding Agency** | **Brief Outcomes of the Project** |
|  |  |  |  |  |  |
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|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Ongoing Projects:**

1. Projects ongoing securing International competitive grants (attach extra sheet, if required)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Project title** | **Duration** | **Total cost** **(USD in million)** | **Funding Agency** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. Matching grants achieved related to Nanotechnology

**Completed Projects:**

1. Projects completed securing Matching grants F.Y. ***2010-11 to 2017-18*** (attach extra sheet, if required)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Project title** | **Duration** | **National contribution****(Rs. in million) by the Govt.** | **Foreign contribution****(USD in million) by**  | **Industry / community contribution (Rs. in million)** | **Brief achievements (targeted)** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

**Ongoing Projects:**

1. Projects ongoing securing Matching grants (attach extra sheet, if required)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Project title** | **Duration** | **National contribution****(Rs. in million) by the Govt.** | **Foreign contribution****(USD in million) by**  | **Industry / community contribution (Rs. in million)** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**(e)** Awards and Prizes won by scientists of organization F.Y. ***2010-11 to 2017-18*** (attach extra sheet, if required)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No.** | **Title of award / prize**  | **Year of award**  | **Awarding Agency** | **Name of Scientist(s)** |
| 1. |  |  |  |  |
| 2. |  |  |  |  |
| 3. |  |  |  |  |
| 4. |  |  |  |  |
| 5. |  |  |  |  |

**(f)** Significant Achievements not covered above (please describe your maximum 5 best success stories or achievements on the following format) (Attach extra sheet if required):

* Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Year of achievement:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Brief description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* \*Social impact: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \*Economic impact: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* If the achievement has been protected through IPR acquisition, please specify below:

(patent / trade mark / industrial design / utility model / geographic indicators): \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Please provide social and economic impact preferably in quantifiable terms such as No. of beneficiaries (for social impact), and value in monetary terms (for economic impact) etc.

# Section 4: Linkages with Industry / Other Institutions

14. Research Coordination / Cooperation (on Nanotechnology):

**a.** Is there any industrial liaison office in your organization / institute / University? (Please put “**x**” in the relevant box, choose only one option)

Yes [ ]

No [ ]

**b.** Number of collaborative activities of your organization / institute / department with the industry during 2010-11 to 2017-18 years. (Please put “**number**” either in one box or more)

 a. Joint research projects with industry [ ]

 b. Research projects contracted to university staff [ ]

 c. Consultancy to industry by academics [ ]

 d. Industry staff as visiting lecturers to university [ ]

e. Funding student’s research by the industry [ ]

f. Student placements in industry [ ]

g. Training of industry staff at university / organizations [ ]

h. Other (please specify) [ ]

**c.** Number of collaborative activities of your organization with other institutions during 2010-11 to 2017-18 years

|  |  |  |
| --- | --- | --- |
|  | Local | Foreign |
| Public  | Private |
|  | Joint research projects |  |  |  |
|  | Exchange visit of researchers |  |  |  |
|  | Sharing of laboratory facilities  |  |  |  |
|  | Any other (please specify) |  |  |  |

# Section 5: Major Constraints & Suggestions

15. What are the major constraints hindering work of your organization / Institute / University? (Please list down the hindering constraints)

a.

b.

c.

d.

e.

f.

16. What are your suggestions for improvement of Nanotechnology research in Pakistan?

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_