**Grant No. 23**

**126 - Ministry of Science and Technology**

**Medium Term Expenditure**

(Taka in Thousands)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Budget**  **2021-22** | **Projection** | |
| **2022-23** | **2023-24** |
| Operating Expenditure |  |  |  |
| Development Expenditure |  |  |  |
| **Total** |  |  |  |
|  | | | |
| Recurrent |  |  |  |
| Capital |  |  |  |
| Financial Asset |  |  |  |
| Liability |  |  |  |
| **Total** |  |  |  |

**1.0 Mission Statement and Major Functions**

**1.1 Mission Statement**

Help in achieving the overall socio-economic prosperity of the country and the nation through peaceful use, propagation, expansion and successful application of nuclear energy including Science and technology research, technology innovation, development and nuclear power production.

**1.2 Major Functions**

* + 1. Review the existing policies on science and technology and formulation of new policy keeping consistence with national goals and plans;
    2. Coordination between the activities of various ministries to implement the National Policy on Science and Technology;
    3. Implementation of the recommendations of the National Council for Science and Technology (NCST);
    4. Provide financial support to research and development activities (for R&D) by individuals / organizations / educational institutions / science clubs related to science and technology and offer fellowship for MS, PhD and PhD and Post-Doctoral Studies in the Country under the Bangabandhu Science and Technology Fellowship Trust;
    5. Establish relationships with international organizations related to science and technology and engage in activities related to contract and cooperation in the respective fields; and take appropriate steps to involve Bangladesh in ongoing development activities;
    6. Ensure Nuclear Safety and Radiation Control as well as peaceful use of atomic energy and provide atomic medical services along with the installation of nuclear power plants;
    7. Development, promotion, expansion of Science and technology and to celebrate National Science and Technology Week for developing awareness amongst the students and popularizing science;
    8. Enhance economic development of the country through the management and control of all the related activities concerning sea research and application of research results.

**2.0 Medium Term Strategic Objectives and Activities**

| **Medium-Term Strategic Objectives** | **Activities** | **Implementing Departments/Agencies** |
| --- | --- | --- |
| **1** | **2** | **3** |
| 1. Providing assistance for research work related to science & Technology | * Provide fellowships and opportunity for higher study and research to researchers | * Secretariat * BCSIR * Bangabandhu Science snd Technology Fellowship Trust |
| * Provide grants to the researchers, concerned organizations and non-government scientific organizations and societies for scientific research | * Secretariat |
| * Conduct training on science and technology | * Bangladesh Atomic Energy Commission * BCSIR * National Institute of Bio-technology * National Science and Technology Museum * Bangabandhu Sheikh MujiburRahman Novo Theatre * Bangladesh Atomic Energy Regulatory Authority |
| * Participation on the training program organized by IAEA/RCA/FNCA/ANSN to implement agreement on regional cooperation | * Bangladesh Atomic Energy Regulatory Authority |
| 1. Popularizing of Science & Technology | * To arrange Seminar and workshop for Science affairs | * Bangladesh Atomic Energy Commission * National Institute of Bio-technology * BANSDOC * Bangladesh Atomic Energy Regulatory Authority * BCSIR |
| * Arrange science fairs/exhibitions/Olympiad at district and national level with permanent science exhibitions | * National Science and Technology Museum |
| * Collect, process preserve, edit and distribute information in all fields of natural science, agricultural science, medical, engineering, industrial technology, scientific research and research. | * BANSDOC |
| * Developing Navotheatre as a center of excellence through recreational science education and aerospace research. | * Bangabandhu Sheikh Mujibur Rahman Novotheatre |
| * To set up network with people including educational institutions for providing accurate information and information about aerospace science |
| 1. Ensure safe and peaceful use of nuclear energy | * Radio isotope related Health services | * Bangladesh Atomic Energy Commission * Nuclear Power Company Bangladesh   Limited (NPCBL) |
| * Production and supply of ammonia tissue and bone graft |
| * Production and supply of ammonia tissue bone grafts |
| Determine amount of radiation exposure to imported and exported food. |
| * Applying radiation to food items |
| * Applying radiation to Medical items |
| * Approval of the management of nuclear and radiation installations | * Bangladesh Atomic Energy Regulatory Authority |
| * Approval of import and export of nuclear and radioactive materials / equipment |
| * Certification of Radiation Control Officers |
| * Regulatory inspection of nuclear and radiation facilities |
| * Regulatory document preparation and technical document evaluation |
| 1. Environment friendly and sustainable technology innovation for socio-economic development | * Conduct research on non-conventional and renewable energy and transfer of innovated technology. | * BCSIR |
| Conduct research and transfer technology invented to ensure public health and quality of food. |
| * Innovation and expansion of technology for industrialization through the use of domestic raw materials. |
| * Provide technological service in trade, industrialization and economic development by examining and creating research facilities to calibrate and ensure the quality of local product and export-import goods. |
| * Publish basic and applied research work and papers to provide main technological service in trade, industrialization and economic development by creating research facilities. |
| * Inform the research result to stakeholders | * Bangladesh Atomic Energy Commission * National Institute of Bio-technology |
| * DNA sequencing service | * National Institute of Bio-technology |
| * Production of Taq DNA polymerase enzyme |
| * Production of aloe vera sapling following tissue culture method and development of farming system applying biotechnology. |
| * Innovation of environment-friendly germs for rice |
| * Diagnosis of pregnancy diabetes in Bangladeshi women with type-2 diabetes mellitus associated genetic variation |
| * Production of eco-friendly microbial enzymes for textile and leather processing |
| * Initiation of sea related research and development projects | * Bangladesh Oceanographic Research Institute |
| * Providing sea related sample analysis services and enriching information on it. |
| 1. Development of infrastructure for expansion of science and technology | * The main construction work of Rooppur Nuclear Power Plant | * Bangladesh Atomic Energy Commission * Nuclear Power Company Bangladesh Limited (NPCBL) |
| * Human resource development of radioactive testing and monitoring laboratory established at Mongla Port including setting up residential facilities. |
| * Establishment of Institute of Nuclear Medicine and Allied Sciences (INMAS) at 8 Medical College Hospital's campus of the country |
| * Establishment of the institute of bioequivalence studies and pharmaceutical sciences | * BCSIR |

**3.0 Poverty, Gender and Climate Change Reporting**

**3.1 Impact of Medium Term Strategic Objectives on Poverty Reduction, Women's Advancement and Climate Change**

**3.1.1 Providing assistance for research work related to science and technology**

**Impact on Poverty Reduction:** No direct impact. However, the standard of living is improved by utilizing the biogas and fuel efficient cook stove technologies. Moreover, self-employment generation is being created by making use of the innovative techniques of BCSIR, making mushroom cultivation, fish food, candles, lacquers and agar products etc. and poverty is being reduced.

**Impact on Women’s Advancement:** No direct impact. However, more energy is saved by using improved stove. Again, since smoke is not spread out, this technology is useful for the protection of rural women. Generally, women have to spend plenty of time and labor to collect fuel. However, by using improved stoves and biogas technology, both time and labor of women are being saved.

**Impact on Climate Adaptation and Mitigation**: Introduction of new climate-resilient technologies is contributing to reducing the loss of disaster which, in turn helps to increase people's adaptability.

**3.1.2 Popularizing of science and technology**

**Impact on Poverty Reduction:** Poor people will be trained and motivated to get involved in science education and modern technology by organising Science Olympiads, Documentaries on science, exhibitions, etc.

**Impact on Women’s Advancement:** Women are encouraged to become science sabby by organizing science fairs and exhibiting digital films and exhibitions.

**Impact on climate adaptation and mitigation:** There is no direct impact.

**3.1.3 Ensure safe and peaceful use of nuclear energy**

**Impact on Poverty Reduction:** By generating electricity from nuclear sources, continuing the activities of fertilizer production, irrigation etc., it is possible to play a role in poverty reduction by increasing agricultural production and other electricity dependent non-agricultural production. It will be possible to protect the people from the harmful effects of imported food by radioactivity tests and various initiatives to control nuclear radiation. Support is being provided to poor people in providing better quality of Nuclear Medicine and health care and determining the quality of food. Receiving services at the nearest and relatively close locations will reduce the relative costs of medical care. Also, medical treatment for poor people will be available through the discovery of the drug processing system.

**Impact on Women’s Advancement:** There is an indirect impact on women. Use of radio-active isotope is making it possible to provide medical services specially diagnosis of some critical diseases of women. This will increase the women's access to public services.

**Impact on climate adaptation and mitigation**: There will be no carbon emissions due to the production of electricity from the atomic source; this will help to achieve the goal of nationally-determined carbon emissions level.

**3.1.4 Environment friendly and sustainable technology innovation for socio-economic development**

**Impact on Poverty Reduction:** Efforts will be made to ensure the best use of unused, less-used resources by inventing advanced technologies in solar power, biogas etc. As a result, it will be possible to increase their income and improve the living standards by ensuring the possible maximum utilization of available resources for the poor.

**Impact on Women’s Advancement:** It will be possible to play a role in the development of women by conducting research on safe, drinkable and pollution-free (arsenic-free) water supply in the household level, which is usually working area for women. Due to the use of sustainable technology in home work, the work hours will be reduced. By spreading knowledge of science to grassroots level, women's participation and social status will be increased and women will be empowered.

**Impact on Climate Adaptation and Mitigation:** Introduction of advanced technologies in solar power, biogas etc., is contributing to achieve climate resilient livelihood.

**3.1.5 Development of infrastructure for expansion of science and technology**

**Impact on Poverty Reduction:** Jobs and enhanced income opportunities will be created for poor people in the infrastructure development work.

**Impact on Women’s Advancement:** The involvement of women in infrastructure development activities will generate direct employment for them.

**Impact on climate adaptation and mitigation:** There is no direct impact.

**3.2 Poverty Reduction, Women’s Advancement and Climate Change Related Spending**

(Taka in Thousand)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Budget**  **2021-21** | **Projection** | |
| **2022-23** | **2023-24** |
| Poverty Reduction |  |  |  |
| Gender |  |  |  |
| Climate Change |  |  |  |

**4.1 Priority Spending Areas/Scheme**

| **Priority Spending Areas/Scheme** | **Related Medium Term Strategic Objectives** |
| --- | --- |
| 1. **Construction of Rooppur nuclear power plant infrastructure:**   To add approximately 2400 MW of electricity to the national grid by 2023-24, Rooppur nuclear power plant has been given priority in the development of appropriate infrastructure. | * Development of infrastructure for expansion of science and technology |
| 1. **Expand peaceful use of nuclear energy**   The provision of nuclear technology-based medical treatment facilities at different parts of the country contributes significantly towards the protection of health of the people in Bangladesh. Further, nuclear power is considered a cost effective option than any hydrocarbon-based power and this sector is given top priority. | * Ensure safe and peaceful use of nuclear energy |
| 1. **Research and development on sustainable environment friendly technology suitable for the poor**   It is necessary to create mass awareness for the environment-friendly new high yielding varieties through application of genetic engineering for increased production in agriculture and non-agriculture sector, as well as for use of non-conventional energy for energy savings and of biotechnology. In addition, this sector has been given priority considering the need for research and development for a food processing system that produces food items free of poisonous/harmful materials, pure drinking water, water purification filters and development of balanced and nutritious food varieties. | * Invention of environment-friendly and sustainable technology for socio-economic development |
| 1. **Expansion of research in the area of scientific technology**   Grants have been provided to the different universities and science, technology related institutions from the research allocation for ministry, and its attached departments as well as their different projects/Scheme for work on science and for encourage and inspire people. | * Providing assistance for research work related to science & technology |

**4.2 Medium Term Expenditure Estimates and Projection (2021-22 to 2023-24)**

**4.2.1 Expenditure by Department/Agencies/Institutional Units**

(Taka in Thousands)

| **Description** | **Budget** | **Revised** | **Budget**  **2021-22** | **Projection** | |
| --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2022-23** | **2023-24** |
|  |  |  |  |  |  |

**4.2.2 Expenditure by Economic Group Wise**

(Taka in Thousands)

| **Economic**  **Group** | **Description** | **Budget** | **Revised** | **Budget**  **2021-22** | **Projection** | |
| --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2022-23** | **2023-24** |
|  |  |  |  |  |  |  |

**5.0 Key Performance Indicator (KPIs)**

| **Indicator** | **Related Strategic Objectives** | **Unit** | **Revised**  **Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| 1. Provided Fellowship | 1 | No. | 2650 |  | 2850 |  | 3050 | 3200 |  |
| 1. Beneficiaries of Received Research Grant | 1 | No. | 525 |  | 550 |  | 550 | 560 |  |
| 1. Trained Manpower | 1 | No. | 1300 |  | 1360 |  | 1370 | 1380 |  |
| 1. Arranged Seminar and Workshop | 2 | No. | 95 |  | 316 |  | 330 | 340 |  |
| 1. Radioactivity measurement of Radiation worker and importead & exported food items | 3 | No. | 15900 |  | 18450 |  | 18550 | 18600 |  |
| 1. Radio isotop related Health services | 3 | No. | 380000 |  | 381000 |  | 382000 | 383000 |  |

**6.0 Recent Achievements, Activities, Output Indicators and Targets and Expenditure Estimates of the Departments/Agencies**

**6.1 Secretariat**

**6.1.1 RecentAchievements:** The Bangabandhu Science and Technology Fellowship Trust Act, 2016 has been formulated. In the last 03 (three) years, Under the science and technology program, the research grant for 1,239 projects amounts to 39.49 crore taka; 33.24 crore taka against 5,499 people under National Science and Technology Fellowship Program; Tk 2.74 billion against 387 people under research grant; 2.40 crore taka against 371 people under other associations / institutions; and Tk 1.94 crore to the private secondary and higher secondary education institutions were allocated. In the last year under the Bangabandhu Fellowship, Fellowship has been awarded to 241 people at the cost of 12.00 crores.

**6.1.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1. Provide fellowships and opportunity for higher study and research to researchers | Fellowship | 1 | Person | 2600 |  | 2800 |  | 3000 | 3150 |  |
| TK.  (core) | 18.00 |  | 20.00 |  | 21.00 | 22.00 |  |
| 1. Provide grants to researchers, concerned organizations and non-government scientific organizations and societies for science related research | Grant for research project | 1 | No. | 575 |  | 600 |  | 640 | 650 |  |
| Grant for other societies and institutions | No. | 190 |  | 200 |  | 210 | 220 |  |
| Grant for Educational Institute and Science Club | Tk.  (Lac) | 280 |  | 315 |  | 325 | 330 |  |

**6.1.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.2 Bangladesh Atomic Energy Commission**

**6.2.1 Recent Achievements:** For Modernization of Nuclear Medical Services and for cancer detection advanced equipment, 3(three) PET-CTs have been installed at National Institute of Nuclear Medicine and Allied Sciences (NINMAS) and Institute of Nuclear Medicine and Allied Sciences (INMAS), Dhaka. In addition to the infrastructural Development, laboratories have been modernized of the Institute of Food and Radiation Biology at Atomic Energy Research Establishment (AERE), Savar. The Nuclear Medical Physics Institute has been established at Atomic Energy Research Establishment (AERE), Savar to provide cancer treatment as well as 1 LINAC machine has been set up in the FY 2017-2018 to develop skilled medical Physicists and technologists in cancer treatment. In order to increase the field for research on Nano-technology, modern equipment has been collected along with the Modernization of the Laboratory at Atomic Energy Center, Dhaka.

**6.2.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1. Conduct training on Science and technology | Trained Manpower | 1 | No | 360 |  | 305 |  | 310 | 320 |  |
| 1. Organizing seminars and workshops on science | Organized seminars and workshops | 2 | No | 52 |  | 53 |  | 54 | 60 |  |
| 1. Provide general and radio-based medical services | Service takers | 3 | No | 380000 |  | 381000 |  | 382000 | 383000 |  |
| 1. Produced amnion tissues and bone graph supplies | Ammonium Graphite supplied | 3 | No | 5900 |  | 5950 |  | 6000 | 6250 |  |
| Provided bone graphite | 15200 |  | 15250 |  | 15300 | 15500 |  |
| 1. Determine radiation levels and radiation levels of imported and exported food | Service delivery | 3 | No | 12700 |  | 11200 |  | 11250 | 11300 |  |
| 1. Application of food radiation | Radiation applied food products | 3 | Quantity  (ton) | 70 |  | 75 |  | 80 | 85 |  |
| 1. Applying radiation to medical materials | Irridation medical Items | 3 | Quantity  (cft) | 2500 |  | 2600 |  | 2700 | 2800 |  |
| 1. Notification of stakeholders for research results | Articles and books published in scientific journals | 4 | No | 150 |  | 152 |  | 155 | 160 |  |
| Organized seminars and workshops | 4 | No | 6 |  | 7 |  | 8 | 10 |  |
| 1. The main construction work of Rooppur Nuclear Power Plant | Physical progress | 5 | % |  |  | 15 |  | 21 |  |  |
| 1. Establishment of residential facilities including development of laboratory testing and monitoring laboratories established at Mongla port | Expenditure against the budget allocated for implementation of the project | 5 | % | 60.00 |  | 26.68\* |  | 13.72 | - |  |
| 1. Establishment of Institute of Nuclear Medicine and Allied Sciences (Imran) at 8 Medical College Hospitals Campus of the country | Expenditure against the budget allocated for implementation of the project | 5 | % | 10.00 |  | 20.00 |  | 25.00 | 45.00 |  |
| 1. Enhanced capacity of the Institute of Nuclear Medicine and Allied Sciences (Immanan) Dhaka, Chittagong, Rajshahi, Khulna, Sylhet, Dinajpur and Rangpur | Expenditure against the budget allocated for implementation of the project | 5 | % | 35.00 |  | 65.00 |  | 0 | 0 |  |

**6.2.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.3 Bangladesh Council for Scientific Industrial Research (BCSIR)**

**6.3.1 Recent Achievements:** In the last 03 (three) years, 325 R & D projects and implementation of 07 (seven) annual development projects (ADP), innovation of 39 new technologies, achieving 30 patents and transfering of 49 technology to entrepreneurs, awarding 150 fellowships, supervising 508 Students' research work and publishing 304 research articles have been taken place in the BCSIR . During this time, 15,727 product samples analysis was done at various industries / industries, import-export companies, government-private organizations and individual level and establishment of 1 new laboratory, modernization of 04 laboratories was happened.

**6.3.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1. Conduct research on non-conventional and renewable energy and transfer of innovated technology. | Published research articles in the local and international journal | 4 | No. | 22 |  | 23 |  | 23 | 24 |  |
| New technologies invention | No. | 3 |  | 4 |  | 4 | 4 |  |
| Accept patent | No. | 3 |  | 3 |  | 3 | 4 |  |
| Commercialized | No. | 3 |  | 3 |  | 3 | 4 |  |
| 1. Conduct research and apply technologies innovated through this research to ensure, preserve quality of food and public health. | Published articles in the local and international journal | 4 | No. | 35 |  | 33 |  | 34 | 35 |  |
| New technologies discovered | No. | 3 |  | 4 |  | 4 | 5 |  |
| Accept patent | No. | 3 |  | 3 |  | 3 | 4 |  |
| Commercialized | No. | 4 |  | 4 |  | 4 | 5 |  |
| 1. Facilitate innovation of technology for using domestic raw materials for industrialization. | Published articles in the local and international journal | 4 | No. | 53 |  | 59 |  | 60 | 61 |  |
| New technologies invented | No. | 9 |  | 8 |  | 9 | 9 |  |
| Accept patent | No. | 5 |  | 6 |  | 7 | 7 |  |
| Commercialized | No. | 9 |  | 9 |  | 10 | 10 |  |
| Arrange meetings / seminars to  disseminate appropriate technology in District or thana level. | No. | 22 |  | 22 |  | 24 | 25 |  |
| Number of science fair held in various centers. | No. | 4 |  | 4 |  | 4 | 4 |  |
| Number of participating school/colleges in the fair. | No. | 145 |  | 150 |  | 155 | 160 |  |
| Number of participate in the fair with Invented technology. | No. | 480 |  | 480 |  | 500 | 520 |  |
| 1. Provide technological service in trade, industrialization and economic development by examining and creating research facilities to calibrate and ensure the quality of local product and export-import goods. | Analysis of industrial/ commercial  products/ Material analysis/service provided. | 4 | No.  (Thousand) | 5300 |  | 5500 |  | 5800 | 6000 |  |
| 1. Publish basic and applied research work and papers to provide main technological service in trade, industrialization and economic development by creating research facilities. | Number and rate of implementation  of project on new research lab | 4 | No. | 3 |  | 4 |  | 4 | 5 |  |
| Number and rate of implementation  of project on modernization research lab | No. | 3 |  | 3 |  | 3 | 3 |  |
| Memorandum of understanding  (MoU) signed in local and abroad. | No. | 16 |  | 17 |  | 18 | 20 |  |
| Number of project under foreign  fund assistance. | No. | 1 |  | 1 |  | 1 | 1 |  |
| Students completed thesis MS/M.phil/Ph.D under supervised by scientists | No.  (Person) | 180 |  | 185 |  | 190 | 195 |  |
| Number of national/ International  seminar/ workshop. | No. | 20 |  | 25 |  | 28 | 30 |  |
| 1. Conduct training on Science and technology | Basic training for officers | 1 | No.  (Person) | 38 |  | 40 |  | 40 | 40 |  |
| Number of students/ trainees from  in-house | No.  (Person) | 1104 |  | 1140 |  | 1160 | 1195 |  |
| Number of trainees in a variety of training institutions within the country. | No.  (Person) | 90 |  | 95 |  | 100 | 110 |  |
| Participation in meeting/seminar in abroad. | No.  (Person) | 35 |  | 38 |  | 40 | 42 |  |
| Participation in meeting/seminar  within the country. | No.  (Person) | 25 |  | 30 |  | 35 | 40 |  |
| Number of supervisors for achieving  research degree students. | No.  (Person) | 180 |  | 185 |  | 190 | 195 |  |
| Number of Officer/scientists  completed higher education (Ph.D, M. Phil, MS) | No.  (Person) | 12 |  | 13 |  | 14 | 15 |  |
| 1. Provide fellowships and opportunity for higher study and research | Provided fellowship for researcher | 1 | No.  (Person) | 50 |  | 50 |  | 50 | 50 |  |

**6.3.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.4 Bangladesh National Scientific and Technical Documentation Centre (BANSDOC)**

**6.4.1 Recent Achievements:** In the last 03 (three) years, information collected 23,963, information distribution 29,660 pages, 50,916 beneficiaries, seminars / workshops / informing meetings 34 was held and internships for 136 students in 13 batch have been provided.

**6.4.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1. Collection, processing, preservation, editing and distribution of information in all fields of natural science, agricultural science, medical, engineering, industrial technology, scientific research and diagnostic development. | Information Collection | 2 | No. | 3305 |  | 6500 |  | 7000 | 7500 |  |
| Information Dissemination | Page | 4691 |  | 7600 |  | 7600 | 8000 |  |
| Beneficiaries | No. | 10192 |  | 15500 |  | 16000 | 16500 |  |
| 1. Organizing seminar and workshop on science. | Awareness Meeting, Seminar & Workshop | 2 | No. | 9 |  | 12 |  | 13 | 14 |  |
| 1. Arranging training on science and technology. | Internship Courses | 1 | No. | 64 |  | 110 |  | 120 | 130 |  |

**6.4.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.5 National Museum of Science and Technology (NMST)**

**6.5.1 Recent Achievements:** In the past three financial years, 2,27,200 visitors visited the Science exhibition at the permanent gallery of the National Science and Technology Museum. 60% of the ongoing package for the project of establishing National Science and Technology Complex has been completed. 15 sophisticated exhibitions have been collected and placed in the museum. 105 seminars on science related topic were organized. 67 science-related quiz competitions have been organized. Students from all the districts of the country participated in this competition. The winners of the quiz competition at the central level were sent to the ex-Bangladesh tour. In the last FY 2014-15 and FY 2015-16, 130 science fairs were held in 64 districts of the country and at National level at Dhaka including observation of National Science and Technology Week. In 2016-17, every Upazila, district and divisional level as well as central level, science and technology week observation, 565 science fairs and 567 science Olympiad was organized. 200 mobile science exhibitions were demonstrated with the help of muzubus and a full-length movie bus. The number of visitors to these exhibitions was approximately 50,000. Upazila Science and Technology Club has been formed in 478 upazilas of the country. Besides, 48 ​​science clubs have been formed at the local level. Under the patronage of this organization, two young scientist has won the Salve-e-Than competition organized by A2i and has been listed for the Innovation Fund. Besides, this organization has organized 18 science-related Olympiad jointly with some renowned science based organizations and 18 international science conferences have been organized.

**6.5.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1. Conduct training on Science and technology | Internal Training | 1 | Man hour | 60 |  | 60 |  | 60 | 60 |  |
| Foreign training | No. | 10 |  | 12 |  | 14 | 15 |  |
| 1. Arrange science fairs / exhibitions / Olympiad at district and national level with permanent science exhibition | Science fair/Seminar/  Workshop/Olympiad | 2 | No. | 1401 |  | 1401 |  | 1401 | 1401 |  |
| Visitors of the Science Museum | No. | 115000 |  | 115000 |  | 115000 | 115000 |  |
| Mobile Science fair | No. | 105 |  | 110 |  | 120 | 130 |  |
| Arrange popular science lectures | No. | 6 |  | 6 |  | 6 | 6 |  |
| Projects of displayed in Science Fairs in 64 districts | No. | 2600 |  | 10500 |  | 10500 | 10500 |  |

**6.5.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.6 Bangabandhu Sheikh Mujibur Rahman Novotheatre**

**6.6.1 Recent Achievement:** With aim to encourage all citizens and students of the country to learn space science through entertainment and to inculcate a positive and accurate idea about cosmic space in their mind, the upgradation of existing Opto-mechanical system at Planetarium of Novotheatre and ultra-modern digital and Hybrid system with synchronization has been established. A 30-minute-long digital film has been developed on the historic life struggle of Father of the Nation Bangabandhu Sheikh Mujibur Rahman. Watching this film, the people of Bangladesh have been receiving the knowledge about the contribution of Father of the Nation in the history and heritage of Bangladesh and other movements including the liberation war. Apart from this, 14 Scientific and 16 Digital Exhibitions, 40 Seated one 5-D Movie Theatre, Smart Games and Smart Step Floor, and one 12 Seated 5-D Edutainment Simulator have been set up. As an informal science educational institution, in the last three years, about 7,672,745 students and visitors have been provided with the right ideas and information about aerospace sciences in order to inspire science education. Online ticketing has been introduced for the convenience of Novo-Theatre visitors. Apart from the continuation of the establishment of the Rooppur nuclear power plant, the Nuclear Industry Information Center (NIIC), equipped with the latest 3D technology, has been established to give a correct idea to the public about nuclear power.

**6.6.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1. Conduct training on Science and technology | Internal training | 1 | Person  No. | - |  | 55 |  | 55 | 55 |  |
| number of saminer/ workshop | No. | - |  | 3 |  | 4 | 4 |  |
| 1. Developing Navogaytor as a center of excellence through science education and space research through aerospace science education. | Visitor in Planetarium | 2 | Person  Thousand | - |  | 150 |  | 155 | 160 |  |
| Visitor in exhibits and Rides | - |  | 105 |  | 105 | 110 |  |
| 1. To provide accurate ideas and information about aerospace sciences, establish a network with public institutions including educational institutions | Letter for communication with the educational institution | 2 | No. | - |  | 60 |  | 70 | 70 |  |
| Number of educational institutions coming to show the novoaster | No. | - |  | 65 |  | 70 | 70 |  |
| Letter / leaflet distribution | No.  Thousand | - |  | 75 |  | 80 | 80 |  |

**6.6.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.7** **National Institute of Bio-technology**

**6.7.1 Recent Achievements:** Aloe Vera sapling prepared in the laboratory following Tissue culture methods was ready to transfer at the end of the field level assessment evaluation. Low-cost tac-polymerase enzyme production from genetically modified organisms in the laboratory activities has been successfully completed. In order to improve the drug and vaccine, the whole-genome sequence of Hepatitis B virus obtained in Bangladesh has been done. Analysis of the 554 DNA samples of the cow has been done to determine the presence of A1 and A2 beta-cage genes related to certain diseases of people with heart disease. 221 samples of SNP have been identified for the diagnosis of pregnancy diabetes in Bangladeshi women with type 2 diabetes mellitus associated genetic variants. Through the process of cryopreservation, the sperm of extinct fish species (bangon fish) was collected and preserved in fluid nitrogen and the rate of fertilization of eggs was observed. In order to develop environment-friendly enzymes in the field of leather DEhearing and textile dyeing, micro-organisms selection and efficacy of manufactured caratinees and mileage enzymes have been examined. For the development and production of environmentally friendly germs for rice cultivation, Nitrogen Components have been selected and preserved from the root and root adjoining soil of the rice plant. Selection of chromium-tolerant 5 microbial chores has been done with the goal of mitigating the soil and water pollution caused by Heavy Metal.

**6.7.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1. Conduct training on Science and technology | Trained Manpower | 1 | No. | 160 |  | 162 |  | 163 | 163 |  |
| 1. Arrangement seminar and workshop relating science | Arranged seminar and workshop | 2 | No. | 2 |  | 2 |  | 3 | 3 |  |
| 1. The result of the study is the integration of steak holders | Published scientific journals and books | 4 | No. | 8 |  | 9 |  | 10 | 11 |  |
| Organized seminars and workshops | No. | 2 |  | 3 |  | 3 | 3 |  |
| 1. DNASequoicing services are provided | Given DNA sequencing  Service | 4 | No. | 72 |  | 75 |  | 80 | 85 |  |
| 1. TAK DNA polymerase enzyme production | Generated TNA DNA Polymerase Enzyme | 4 | No.(iu) | 29000 |  | 30000 |  | 31000 | 32000 |  |
| 1. Development of the cultivation method for the production of Eco-seed plants and application of biotechnology in tissue culture method. | Elohera seed production and production of pest feeding through tissue culture and performance assessment of the field of organization | 4 | No. | - |  | - |  | - | - |  |
| 1. Innovative environment-friendly germs for rice | Separation, preservation and detection of nitrogen collagenator from the root and adjoining soil of the rice plant | 4 | No. | 36 |  | 40 |  | 45 | 50 |  |
| Detection of active bacterio technology and active weather selection | No. | 18 |  | 20 |  | 22 | 25 |  |
| 1. Environmental friendly microbial enzyme production for the textile and leather industry | Collection of microscopic samples, selecting the desired microscopic separation and enzymes to produce samples. | 4 | No. | 50 |  | 55 |  | - | - |  |
| Determined microscopic detection and measuring their enzyme production capacity | No. | 22 |  | 25 |  | - | - |  |
| Monitoring the results of enzymes produced by microbes and skin implants | No. | 12 |  | 15 |  | - | - |  |
| 1. Diagnosis of pregnancy diabetes in Bangladeshi women with type-2 diabetes mellitus associated genetic variation | DNA segregation by collecting blood samples | 4 | No. | 45 |  | 50 |  | 55 | 60 |  |
| Conducting polymerase chain reduction (PCR) | No. | 135 |  | 150 |  | 165 | 175 |  |
| SNP detection | No. | 135 |  | 140 |  | 165 | 175 |  |

**6.7.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.8 Bangladesh Atomic Energy Regulatory Authority**

**6.8.1 Recent Achievements:** Issuing Design and Construction Licence for Unit 1 of Rooppur Atomic Power Plant on 02 November, 2017, was the main achievement of Bangladesh Atomic Energy Regulatory Authority in the last 3 (three) years. At the time specified, to help the establishment of this power plant by ensuring nuclear security, the Authority has signed the General Framework Agreement (GFC) (sign on November 18, 2016) for the Preliminary Safety Analysis Report, Feasibility Evaluation Report, Quality Assurance (QA) and Conformity Assessment with ‘TSO JSC VO Safety’ of Russian Regulatory Authority ROSETECHNADZOR. Besides, an agreement on ‘Exchange of Technical Information and Cooperation in the Regulation of nuclear security and radiation protection' with Atomic Energy Regulatory Body (AERB), India has been signed (on 17 October 2016). Above all, Issuance of 1024 new licenses for nation-wide radiation installations (nuclear medicine, radiotherapy, diagnostic X-rays, education and research and industrial establishments) established in the last 3 years, renewal of 3525 radiation installations and radiation sources and inspection of 945 radiation installations including providing 1112 permits and NOCs have been carried out by the Authority following the provisions of Bangladesh Atomic Energy Control Authority Act, 2012 .For the radiation workers of these organizations, by organizing 36 training courses, a total of 1349 trainees have been provided training on radiation protection in the last three years.

**6.8.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | 9 | **10** | **11** |
| 1. Authorization for operation of nuclear and radiation facilities | Issued license for the facilities | 3 | No. | 410 |  | 420 |  | 420 | 425 |  |
| Renewed license for the facilities | 1220 |  | 1230 |  | 1240 | 1250 |  |
| 1. Authorization for import and export of nuclear and radioactive materials/radiation generators | Issued permit/NOC | 3 | No. | 380 |  | 390 |  | 395 | 400 |  |
| 1. Certification of Radiation Control Officers | RCO certificate issued | 3 | No. | 295 |  | 300 |  | 305 | 310 |  |
| RCO certificate renewed | 295 |  | 300 |  | 305 | 310 |  |
| 1. Regulatory inspection of nuclear and radiation facilities | Regulatory inspection | 3 | No. | 350\* |  | 361 |  | 366 | 371 |  |
| 1. Regulatory document preparation and technical document evaluation | Preparation and evaluation of regulatory documents | 3 | No. | 16 |  | 17 |  | 17 | 18 |  |
| 1. Organizing seminars and workshops on science | Training courses organized | 2 | No. | 12 |  | 13 |  | 15 | 15 |  |
| Trained manpower | 420\* |  | 420 |  | 420 | 430 |  |
| 1. Participation on the training program organized by IAEA/RCA/FNCA/ANSN to implement agreement on regional cooperation | Participants | 1 | No. | 62\* |  | 63 |  | 64 | 65 |  |
| 1. To arrange Seminar and workshop for Science affairs | Organized seminars and workshops | 1 | No. | 7 |  | 8 |  | 9 | 10 |  |

**6.8.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |

**6.9 Bangladesh Oceanographic Research Institute**

**6.9.1 Recent Achievements**: Creation of 223 posts in three stages (1st phase: 137, second phase: 31, 3rd phase: 55 posts) have been done in the light of the Bangladesh Ocean Research Institute Act-2011. Organogram was formulated on July 18, 2016. Efficient manpower making activities have been undertaken by providing technical training to scientists and officers. In the laboratory, 1096 different analytical sample collection tools have been collected for research activities.

**6.9.2 Activities, Output Indicators and Targets**

| **Activities** | **Output Indicator** | **Related Strategic Objectives** | **Unit** | **Revised Target** | **Actual** | **Target** | **Revised Target** | **Medium Term Targets** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2019-20** | | **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | 9 | **10** | **11** |
| 1. Research and development of sea related research and development projects | R & D Project | 4 | No. | 5 |  | 5 |  | 6 | 7 |  |
| Notification of steak holders of R & D project results | No. | 2 |  | 2 |  | 3 | 4 |  |
| 1. Providing sea-related sample analysis services and enriching information | Providing sample analysis services and data collection related to the sea | No. | 2 |  | 2 |  | 3 | 3 |  |

**6.9.3 Medium Term Expenditure Estimates by Institutional Unit, Scheme and Projects**

(Taka in Thousands)

| **Name of the Institutional Unit/Scheme/ Project** | **Related Activity** | **Actual**  **2019-20** | **Budget** | **Revised** | **Medium Term Expenditure Estimates** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2020-21** | | **2021-22** | **2022-23** | **2023-24** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|  |  |  |  |  |  |  |  |