

REPORT ON THE ACTIVITIES OF SCIENCE & TECHNOLOGY DEPARTMENT FOR THE YEAR 2009-10

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1. INTRODUCTION

The Science & Technology Department is the nodal Department for the promotion of the Science & Technology in the State. The manifold scientific and technological activities are carried out by different agencies like Orissa Renewable Energy Development Agency (OREDA), Orissa Space Application Centre (ORSAC), Orissa Bigyan Academy (OBA), Pathani Samanta Planetarium (PSP), Institute of Mathematics & Applications (IMA) and Institute of Materials Science (IMS) working under the aegis of this Department with the following objectives:-

- i) To keep abreast of the latest developments in the field of Science & Technology and to take steps for dissemination of these among institutions like industries, research laboratories, Universities and among scientists and technologists.
- ii) To co-ordinate the R&D Programmes of different departments, industrial and research institutions and to ensure scientific and technical co-operation among these institutions and agencies.
- iii) To formulate and fund, research and application programmes in the field of science and technology,
- iv) To encourage, develop and extend the use of renewable sources of energy including energy plantations.
- v) To popularize Remote Sensing Technology and make effective use of it.
- vi) To popularize science and technology among students and the people so as to inculcate in them a scientific temper and attitude.
- vii) Promote and popularize appropriate rural technologies.
- viii) Development of Library cum Documentation Centre for Science & Technology.
- ix) Science & Technology communication through awareness promotion, support to Institutions for Seminars/Workshops etc., development of Science Centres and administration of Pathani Samanta Planetarium.

- x) To conduct Science & Technology Entrepreneurship Development Programmes.
- xi) To undertake fundamental research in mathematics and its application.
- xii) To conduct basic and applied research in the frontier areas of Material Science & Engineering.

2. STATE COUNCIL ON SCIENCE & TECHNOLOGY

The State Council on Science & Technology functions as the highest policy making body for development of Science & Technology and oversees the implementation of the programmes undertaken in the field of Science and Technology in the State.

The activities pertaining to various programmes / schemes undertaken during the year 2009-10 are briefly stated below:

2.1 Scholarship at Post Graduate Level on Basic Sciences

To promote and encourage the meritorious students to pursue their Post Graduate studies in Basic Science subjects such as Physics, Chemistry, Mathematics, Botany, Zoology and Geology, Government of Orissa in Science and Technology Department introduced a Scholarship programme @ Rs 2000/- per month for 25 students under the aegis of "The State Council on Science and Technology" from the academic year 2008-2009. The Institute of Mathematics and Applications, Bhubaneswar is the Nodal agency to implement this scheme as per rules. 23 students, out of 25 selected and enrolled during the year 2008-09, are continuing in the 2nd year. Besides 25 students have been enrolled during the year 2009-10 having 4 each from Physics, Chemistry, Botany, Zoology and Geology and 5 from Mathematics and are continuing in the 1st year under different Universities of Orissa.

2.2 Travel Grant

The State Council on Science & Technology, Orissa has been providing partial financial support to the Scientists of the State to promote scientific temper & encourage Scientists of Orissa, to enable them to attend National / International Conferences,

Seminars, Workshops, Symposiums etc. and to interact with leading International Scientists in their respective field. During 2009-10, three Oriya Scientists have been provided partial assistance under this programme.

a. Dr. Motahar Reza, NIST, Berhampur for attending International Conference on Fluid Mechanics, Heat transfer and Thermo -dynamics , France, 04-06, July,2008.

b. Prof. Rabinarayan Parida. ABIT, Cuttack for attending Asia Pacific Power and Engineering Conference (APPEEC), China, 28-31 March, 2009.

c. Dr.H.K.Tripathy,GIST,Raygada for attending IEEE International conference , Singapore , 17-20 April, 2009.

A resolution on Travel Grant increasing the maximum limit of grant money from Rs.20000/- to Rs. 30000/- has been issued for attending International Conferences, Seminars etc.

2.3 Assistance for Scientific Symposium, Seminar, Workshop etc.

a) State Council on Science & Technology has provided partial financial assistance of Rs.50000/- for the 12th Orissa science congress held at Bhubaneswar from 5-6, December,2009.

b) To mark the occasion of International year of Astronomy-2009 a State level science fair was organized at Regional Science Centre, Bhubaneswar on 17.12.2009 in collaboration with the Project Coordinator, Regional Science Centre, Bhubaneswar with conferring award of cash prize to the winners.State Council on Science &Technology has sanctioned and released a sum of Rs.55000/- for the purpose.

c) One time grant of Rs.10 lakh for scientific exposure visit programme was sanctioned as per proposal received from the Director, IMS, Bhubaneswar to create scientific temper and attitude in the young minds of ST & SC school students located in the Tribal Area Sub- Plan (TSP) zones of Orissa.

2.4 UNESCO- Kalinga Prize

The Kalinga Prize initiated by Late Biju Pattnaik through UNESCO in 1951 for the Popularization of Science has been renamed as UNESCO- Kalinga Prize from the year 2008. The prize will be awarded on Biennial basis instead of annually. Orissa State Council on Science &Technology donates and coordinates for UNESCO- Kalinga Prize.

The prize money has been increased to 10,000 pounds. The award was presented on 5th November, 2009 at the 4th world science forum in Budapest held from 5-7, November-2009. Renowned educationists Prof. Yash Pal from India and prof. Trinh Xuan Thuan from Vietnam have been declared joint winners of UNESCO-Kalinga Prize for 2009 for popularization of science.

2.5 Establishment of Sub-Regional Science Centers.

The State Council on Science & Technology is taking active steps for establishment of Sub-Regional Science Centers at different Regions in Orissa to develop scientific temper, to promote creative activities, to highlight important and relevant issues in science and technology and to popularize these for the benefit of the community specially students and young mass. Action has been taken for setting up of **three** Sub Regional Science Centres in Orissa

a. Nrusinghnath, Bargarh District

- Commitment letter has been issued to NCSM Kolkata for establishment of Sub Regional Science Centre at Nrusinghnath in Bargarh District, Orissa.
- State share of Rs.130 lakh has been earmarked to deposit with the NCSM, Kolkata.
- Tahasildar, Paikmal has been moved for alienation of land to Science & Technology Department for the purpose.

b. Jeypore, Koraput District

- Tahasildar, Jeypore has been moved for alienation of land to Science & Technology Department for setting up of Sub Regional Science Centre at Jeypore in Koraput district.

c. Keonjhar, Keonjhar District

- Collector Keonjhar has been moved for alienation of land to Science & Technology Department for setting up of Sub Regional Science Centre at Keonjhar.

2.6 Participation in the 97th Indian Science Congress, Thiruvananthapuram.

State Council on Science & Technology took initiatives for participation in the 97th Indian Science Congress held at Thiruvananthapuram from 3-7, January, 2010 and successfully coordinated with the DST- Gol, Organizers and the participating Institutions. The Team Orissa headed by the Junior Scientist participated in the 97th Indian Science Congress. The participation was well organized which culminated in bagging the “Best State” prize in the “Pride of India” Science Exhibition at Thiruvanthapuram.

2.7 Installation of Stand alone Water Purification System

Department of Science & Technology, Government of India have been pleased to install suitable water filters in 20 schools in Orissa for scientific evaluation of Water Purification System basing on the water testing report as per Indian Standard Drinking Water-Specification, IS:10500 from a NABL accredited laboratory under “Installation of stand alone water purification system” scheme. Funds have been provided by the DST, Gol. The first phase work i.e. sampling and analysis of drinking water of 20 different schools in Orissa has been completed and testing reports have been submitted to DST, Gol. The second phase work is under progress.

2.8 Encouragement to Inventors with Reward.

State council on Science & Technology has taken an initiative during 2009-10 to reward the local inventors and assistance for further necessary follow up action. The following two Inventors have been rewarded with cash money of Rs.25000/- each by Shri Ramesh Chandra Majhi, the Hon'ble Minister, I.T. and Science & Technology, Orissa on 09.02.2010.

- a. Shri Jayaram Mallick, At-Balarampur, P.O./Via- Kujanga, Dist-Jagatsingpur, Orissa for innovation of concrete hand pump.
- b. Shri Kishore Chandra Sahu, At- Dadapatna, PO-Baranga, Dist-Cuttack, Orissa for innovation of machine for generating electricity using sea wave .

2.9 Research Grant under “Development of biotechnology”

State Council on Science & Technology has sanctioned Research Grant amounting to Rs.30.79 lakhs under the scheme “Development of biotechnology”. The grant has been released to 12 Nos Investigators during the year 2009-10.

2.10 Participation in the Brainstorming meeting of SAC-PM with State S&T Councils.

A Brainstorming meeting of Scientific Advisory Council to PM (SAC-PM) was held at New Delhi with the representatives of State S&T councils on 27.03.2010 in the Auditorium of Indian National Science Academy (INSA) under the Chairmanship of Prof.C.N.R.Rao.F.R.S. Delegate Members of SAC-PM, Planning Commission and Eminent Scientists from Department of Science & Technology, Government of India participated in the meeting. Prof. K. Kasturirangan, Chairman Planning Commission, Prof, T. Ramasami, Secretary, DST and Dr.G.J.Samathanam, Scientist ‘G’ and Head TDT were in the Dias along with Prof.C.N.R.Rao. Individual presentation by the representatives of State Councils and open discussion was made in respect to Policy Development, Resource Mobilizations, Re-Structuring, Plan Allocation, Improvement in the existing mechanism and Role of S&T Councils in the emerging national context etc.. The Senior Scientist of Science & Technology Department, Orissa represented the State Council on S&T, Orissa and participated in the meeting.

2.11 Others

- i.** Registration of State Council on Science & Technology, Orissa has been done to avail grants from DST, Government of India.
- ii.** TIFAC, New Delhi has been moved for establishment of patent information centre under the State Council on Science & Technology, Orissa.
- iii.** Six participants from Orissa took part in the Master Resource Persons’ training programme on total solar eclipse - 2009 in Gangtok, Sikkim during June 8-10, 2009. State Council on S&T has coordinated this programme.
- iv.** Solar Lantern and Solar Cooker shall be provided to 50 numbers of un-electrified/ marginally electrified Tribal Residential Schools in Orissa.

- v. Integrated Renewable Energy System shall be demonstrated in an Ashram School under ST & SC Development.

3 DEVELOPMENT OF BIOTECHNOLOGY

- 1) Biotechnology is a frontier area of technology with immense benefits to society in diverse areas such as Food Security, Nutritional Supplementation, Health Care Productions and Industrial applications. Considering the diversified resources of the State, this cutting edge technology has a potential to make a significant contribution to the economy of the State.
 - 2) Research grant has been sanctioned for 12 short term Research & Development Project in Biotechnology.
 - 3) Ac.64.613 Government land at Mouza Andharua has been leased out by Collector, Khordha in favour of Managing Director, Orissa Industrial Infrastructure Development Corporation (IDCO), Bhubaneswar for development of a Biotechnology Pharma IT Park (Konark Knowledge Park) in PPP Mode. Payment has been made towards Land premium, ground rent and cess to the Collector, Khordha for the purpose through IDCO, Bhubaneswar.
 - 4) Hon'ble Chief Minister, Orissa has laid Foundation Stone of Biotech Pharma IT Park (Konark Knowledge Park) on 25.10.2009 at 10.30 A.M. at Andharua, Bhubaneswar.
 - 5) An interaction programme for Biotechnology students with eminent Biotech Professionals and experts was organized after the Foundation Stone laying ceremony of the Park (Konark Knowledge Park) is over. During the interaction, the 'Khorana Programme' of University of Wisconsin-Madison, USA was discussed among other topics. "The programme along with 2009 India Khorana Programme Fellows" has been furnished to concerned State Universities and other Biotechnology institutions to facilitate availing opportunities by the Biotechnology Students, extended under this programme.
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- 6) The Science & Technology Department through its agencies and Biotechnology Cell had participated in the 97th Indian Science Congress held at Thiruvananthapuram, Kerala from 3d to 7th January, 2010.
- 7) Provision of piped water supply to the park as well as to the Institute of Mathematics and Applications at Mouza -Andharua is in final stage of completion.
- 8) Active steps have been initiated for development of two more Biotech Parks in the State i.e. one at Deras, Khordha & other Marine Biotech Park in Ganjam district.

4. ORISSA RENEWABLE ENERGY DEVELOPMENT AGENCY (OREDA)

Orissa Renewable Energy Development Agency (OREDA), under the Department of Science & Technology, Government of Orissa is a Society constituted under Societies Registration Act-1860. The main objectives of this Agency in the development of New and Renewable Sources of Energy are:

- (i) to encourage the development and accelerated utilisation of renewable energy sources wherever they are technically and economically viable.
- (ii) to improve the access to and availability of renewable, decentralized sources of energy particularly for the rural population,
- (iii) to contribute towards balanced rural and urban development as well as development of backward, hilly and tribal areas by enabling the use of locally available decentralized renewable energy sources and to create gainful employment opportunity with due importance for ensuring greater access to woman and other disadvantage groups to employment opportunities,
- (iv) to reduce environmental degradation resulting from deforestation.

Activities:

The important activities, which have been so far taken up and are being implemented by this Agency during 2009-10 are outlined hereunder.

4.1 State Level Renewable Energy Awareness Park.

The State Level Renewable Energy Awareness Park christened as “Biju Patnaik Energy Park” has been established in Bhubaneswar near Khandagiri. The Park would enter-alia have the following objectives.

- (a) Create awareness about renewable energy and its application in daily life among all categories of people.
- (b) Educate common people about energy conservation practices.
- (c) Attract entrepreneurs towards renewable energy based business.
- (d) Provide students and researchers pertinent data about history and development of renewable energy resources and devices.

4.2 Village Energy Security Programme (VESP)

The Village Energy Security Programme envisages meeting the total energy requirement for cooking, electricity and motive power of villages and communities situated on the fringes or inside forests. This programme has been launched in the MNRE, Govt. of India during the year from 2005-06. No new projects have been sanctioned during 2009-10. 3 projects started during 2008-09 in Debabhuin in Cuttack, Kalikahamar in Nabarangpur and Bhaliaguda in Mayurbhanj districts are under progress.

4.3 Remote Village Electrification Programme (RVEP)

The objective of the programme is electrification of those unelectrified remote census villages and remote unelectrified hamlets of electrified census villages where grid connectivity is either not feasible or not cost effective through non-conventional sources of energy with the financial assistance of Government of India and State Government.

During 2009-10 a total of 371 remote villages in 8 districts have been sanctioned by MNRE, Govt. of India for coverage under RVEP with a total financial outlay of Rs.31.97 crores. Out of these work orders have been placed against 245 villages on Central Electronics Ltd. and Bharat Electronics Ltd, the major Central PSUs and the work is now under progress. Further survey is in progress in 23 identified villages.

4.4 National Biogas and Manure Management Programme (NBMMP)

The National Biogas and Manure Management Programme (NBMMP) is a high priority Central Sector Scheme, and a part of the 20-Point Programme. It can be used for cooking and lighting purposes. It also provides rich organic manure. During the year 2009-20, a target of 5000 biogas plants were allotted for Orissa by MNRE, Govt. of India. The total achievement against target is 4507.

4.5 SPV Programme

During 2009-10 under the Solar Photo Voltaic (SPV) programme a 2KWP stand alone solar power plant has been installed in Satapada village of Puri District.

4.6 Renewable Energy Policy

Policy Guidelines on Power Generation from Non-Conventional Energy Sources have been issued vide Science & Technology Dept. Letter No. 6971/ST dated 3.12.2005. The main objectives of the Policy are to reduce dependency on conventional sources of power generation. Other objectives are,

- (i) Protecting the environment,
- (ii) Generation of employment on a large scale,
- (iii) Generation of grid quality power from NRSE, so as to reduce dependence on conventional sources of power,
- (iv) Encourage entrepreneurial investment in NRSE,
- (v) Provide such rational fiscal and promotional incentives so as to provide conducive atmosphere to attract private investment.

OREDA is the State Nodal Agency for Power Generation from Non-Conventional Energy Sources and functions as the single window for promotion and facilitation of all projects.

4.8 Renewable Energy Power Projects

- **Solar Power Projects**

- OREDA has been proactively promoting Solar Power Projects under the Jawaharlal Nehru National Solar Mission with a view to fulfil the Solar Power Purchase and Renewable Power Purchase obligation of the State to start with.

- During 2009-10 a total 19 Solar Power Projects proposed by different private developers for a cumulative capacity of 294 MW with an approximate, investment of 5292 crores were cleared by the State Technical Committee and recommended to MTPC / MNRE for inclusion under the National programme.

- **Biomass Power Projects**

The Biomass Power Potential of the State has been estimated to be about 300 MW.

So far the State Technical Committee has cleared a total of projects for a cumulative capacity of 173 MW with an approximate investment of about Rs.900 crores.

- The first 20 MW projects in Dhenkanal is to be commissioned by July 2010.

- **Wind Power Projects**

- The estimated wind power potential in Orissa is about 800 MW.

- Wind resource assessments are being taken up in 22 sites by C-Wet, Chennai in organization under the Ministry of New and Renewable Energy, GOI and Suzlon and Epuron wind power majors in private sector.

- During 2009-10 in principle approval for 99 MW in Koraput and Nabarangpur district.

4.9 Energy Plantation and Bio-Diesel Production

During the year a decision was taken to discontinue back ended subsidy to support Jatropha plantations being raised by individual farmers by availing bank loans and link NREGA to the programme so as to provide the necessary labour as well as material component for raising plantations of Jatropha through NRGES job card holders.

Accordingly guidelines for operation of the programme under NREGA was prepared in consultation with Panchayati Raj Department and the same was circulated to all districts.

4.10 Clean Development Mechanism (CDM) Projects

A programme of Activity under Clean Development Mechanism has been taken up in association with KfW, the German Government Bank so as to sell the carbon emission reduction resulting from biogas plants. This is supposed to bring in more financial benefits to owners of Biogas Plants and ensure proper maintenance of the plants.

4.11 Workshop and Training

Funds has been placed with 21 districts for organisation of 30 nos. of orientation and awareness camps under the Information and Public Awareness Programme.

4.12 Renewable Energy Club

In order to create awareness about New & Renewable Sources of Energy, its various systems and devices amongst the students, Renewable Energy Clubs in 10 Engineering Colleges have been set up in the State. These clubs are regularly organizing seminars, symposium, workshops, exhibitions etc to promote renewable energy.

4.13 Celebration of Rajiv Gandhi Akshaya Urja Diwas (RGAUD)

The Rajiv Gandhi Akshaya Urja Diwas was celebrated as Renewable Energy Day on 20.08.2009 in the State Capital of Orissa followed with a Mass Rally / Run, Exhibition women football match, different competitions among the students, panel discussions on renewable energy programme in Regional Kendra of Doordarshan, Bhubaneswar and seminar. Besides, district level celebrations were also organized by the district administration.

4.14 Awareness Generation, Publicity and Exhibition during 2009-10.

Funds have been placed with six districts namely Ganjam, Kalahandi, Koraput, Nabarangpur, Sambalpur and Puri for erection of six numbers hoardings on renewable energy programme.

Funds have been placed with 10 districts namely Baragarh, Balangir, Gajapati, Jharsuguda, Kalahandi, Koraput, Sambalpur, Sonapur, Sundergarh and Nuapara for putting up Advertisement boards on Bus-back panels.

Similarly ad-panels have been given on bus stop shelters in two districts namely Nabarangpur and Khurda.

Funds have been placed with all thirty districts for 100 nos of wall paintings on different renewable energy projects and programme.

Radio Jingles on renewable energy has also been broadcasted in All India Radio, Cuttack on NBMMP and other RE programme. Besides 10 seconds spots on different renewable energy programme have been telecasted on O-TV, ETV, Kanak TV, Kamyab TV and Doordarshan (Oriya).

Advertisement have been published in different Oriya news papers for awareness generation on different renewable energy programme.

Stalls have been opened during different meals and festivals such as Gajalaxmi Puja at Dhenkanal, Baliayatra, Cuttack, Boita Bandan Utsav, Paradeep, Dhanu Yatra at Bargarh, National Kharavel Exhibition at Bhubaneswar, Annual Adivasi Exhibition at Bhubaneswar and district level exhibition at Sundergarh.

5. ORISSA SPACE APPLICATION CENTRE (ORSAC)

Important Activities of ORSAC for the year 2009-10 are as follows:

5.1. FASAL

Four forecasts on acreage and production of Kharif paddy ragi, groundnut and jute have been made during July, September, October and November 2009. The paddy acreage has been estimated through the analysis of multi-date RADARSAT SAR data and yield forecast is based on agro-meteorological models. The results have been made available to the user departments of State and Central Govt. for decision making on procurement, storage, transport and price fixation of food grains.

5.2 GRAMSAT PROJECT

78 interactive training programmes have been conducted by the user departments from April 2009 to March 2010. 130 episodes each of news programmes "Sunara Odisha and Swapnara Odisha" have been produced and transmitted through OTV and ETV respectively.

5.3 BLOCK LEVEL RESOURCE ATLAS AND GIS DATABASE GENERATION

The Block level Resource Atlas and GIS database "Odisha Sampada" have been developed and submitted to National Informatics Centre (NIC), Bhubaneswar for making the package web enabled.

5.4 RESURVEY OF CADASTRAL MAPS IN ORISSA

Pilot Projects on Cadastral survey in two villages namely Pitambarpur sasan and Bijayapadmanavpur coming under Digapahandi Tahasil, using high resolution satellite data supplemented with ETC and DGPS survey has been completed and reports thereof submitted to Revenue & Disaster Management Department. After the Pilot phase cadastral survey in four districts namely Ganjam, Khurda, Cuttack and Keonjhar

has been taken up using aforesaid technology. Monumentation over 1190 sites of ground control points has been completed. Requisite satellite data has also been indented with NRSC Hyderabad.

5.5 ASSESSMENT OF VEGETATION CARBON POOL IN ORISSA

Foreign Inventory data has been collected for 16 sample points in Sundargarh, Jharsuguda, Samabalpur, Angul and Deogarh districts.

5.6 LANDUSE / LAND COVER MAPPING OF MINING AREAS OF BAITARANI R.F.

The land use / land cover mapping of Baitarani R..F. has been completed.

5.7 LANDUSE / LAND COVER MAPPING IN BAPHALIMALI MINING AREA

The land use / land cover mapping in Baphalimali Mining Area has been completed.

5.8 EDUSAT PROGRAMME

Edusat Technology Programme was dedicated to the students of the State by the Honourable Chief Minister on 31st August, 2009. After that class room teaching transmission on Mathematics and Science has been made for 77 days for 9th and 10th class students.

5.9 TRAINING PROGRAMMES CONDUCTED

- i) Two days training programme on GIS based Aqua Farm Information System for the Regional Officers of MPEDA, Bhubaneswar - 4th and 5th March 2010.
- ii) Three days workshop on National Urban Information System (NUIS) for the Planners / Engineers of Urban Local Bodies of Orissa – 4th to 6th August 2009.

6. PATHANI SAMANTA PLANETARIUM (PSP)

Pathani Samanta Planetarium is a premier institute of the state for popularization of science in general, Astronomy, Astro-Physics and Space science in particular under the administrative control of Science and Technology Department, Government of Orissa.

Pathani Samanta Planetarium, Bhubaneswar was inaugurated on 8th January 1990. Since its inauguration PSP has increased its activities many fold and it has

established a link throughout the state. Various programmes are being conducted throughout the state. About 1, 00,000 (One Lac) visitors visit planetarium every year.

The main objective and function of the Planetarium are to bring to the public the awe and wonders of the universe through the planetarium shows. It aims at creating awareness on astronomy, astrophysics and space science among the common mass in general and among the young students in particular. It serves as the key institution of the state in instilling scientific temper among the people.

Besides presenting Planetarium shows PSP has taken up a no. of activities for popularization of science, specifically astronomy and for creating consciousness and its culture in the state. Further, it is also deeply engrossed in research and development works. Some of the activities include night sky watch programme, publication of wall magazine 'Chhayapath', teachers training programme on astronomy, astro-physics and space science, contact programme for talented secondary school students, Astronomy Olympiad, demonstration of astronomical models, Amateur astronomers' meet, workshops, seminars, symposia, monthly meeting of SCAAA, Bigyan Lekhaka Sammukhya (science writers forum) etc.

Keeping its objectives in view various programmes are organised round the year to popularize science in general and astronomy in particular. Pathani Samanta Planetarium, has a state of art planetarium equipment with a auditorium capacity of 140. Various planetarium programmes were presented to public through these equipments.

	PSP Show	Light & Sound Show
Total Show	1139	60
No. of Adult Visited	44575	2432
No. of Child Visited	34250	3591
Total No. of Person Visited	78825	6023
Total amount collected (In Rs.)	9,68,380.50	1,00,025.00

Pathani Samanta Planetarium has taken up following activities in the year 2009-10.

6.1. Planetarium Programmes:

Two planetarium programmes (a) **Bibhinna Jagatara Jalabayu (Three shows in Oriya)** (b) **World and Weathers (One in English)** are running every day (except **Monday**) Planetarium presented shows of about 40 minutes on various astronomical topics for general public through out the year. During special shows for school students, normally a discussion and question- answer session is conducted on the contents of the programme. This year 84,848 visitors visited the planetarium shows.

6.2 Light, Sound & Water Programme:

On 14th May, 2006 the Hon'ble Chief Minister of Orissa, S.J. Naveen Pattnaik inaugurated Light, Sound & Water Programme. The Light, Sound and Water Programme established in the premises of the Pathani Samanta Planetarium is gaining popularity day by day. The basic features of this programme are based on use of (i) Laser Projector, (ii) Water Screen (iii) Intelligent Moving Head Projector and (iv) Eight Channel Audio Track. Musical fountain are the most attractive features of this programme. This programme is based on the Kalinga War and the **Emperor Kharavela**.

6.3. Astronomy Park:

In the premises of the Pathani Samanta Planetarium an Astronomy Park is established with some Indoor and out door models to include the scientific spirit, curiosity and quest in young minds. The park is designed to entertain through the process of "**Learning while playing**". The park enriched with some beautiful scientific models like PSLV Rocket, Horizontal Sundial, Equatorial Sundial, Vertical Sundial, Solar System, Jupiter, Mars, and their satellite, Swing as pendulum, See through the wall etc.

6.4 Night Sky Watch Programme :

Night sky watch programme were organized in the premises of PSP during every month after the new moon for three days. Visitors from different nooks and corners were

thrilled to observe the celestial bodies with the naked eyes and through the telescopes. These telescopes are used frequently to conduct night sky watch programs at planetarium and out side planetarium. This programme is normally conducted from September to June every year when the sky is clear for observation. This programme is organized at different places of Orissa in collaboration with local bodies like schools, colleges.

6.5 Life and Art work on Samanta Chandrasekhar

Life and Art work on Samanta Chandrasekhar placed in premises of Pathani Samanta Planetarium is an attractive for children. This has been designed with a view to informing the people of Orissa regarding extra ordinary talent of Samanta Chandra Sekhar on Astronomy.

6.6 SCAAA Progmmme:

With the active cooperation of the Staff members of Pathani Samanta Planetarium and members of SCAA the Monthly meetings of SCAAA were held on Sunday following the second Saturday. Different popular science lectures were delivered by the eminent Scientist in the premises of PSP. Members ranging from students to scientists attend this meeting.

6.7 Young Astronomers Talent Search -2009 (YATS-2009)

With a view to popularizing astronomy and astrophysics among the students and spotting & nurturing young talents interested in astronomy Pathani Samanta Planetarium, Bhubaneswar in collaboration of **TATA Steel** has organized **A State Level Yong Astronomer Talent Search-2009** in all over the state. The students from Class-VIII to X (both English and Oriya medium) have participated in the programme. They had sent a brief write up on subject **“India in Space”** and selected candidates were called for to attend the zonal camps (on their respective zone) from 20th October 09 to 28th October 2009 in various places of Orissa like Keonjhar, Belpahar, Jajpur, Bhubaneswar, Joda, Jeypore, and Berhampur. The students were reimbursed actual travel and other expenses to attend the camp. More than 600 students through out the state participated in the zonal camps in seven different places of Orissa. Among those students about 118 students are selected to participate in State level YATS-2009 at Bhubaneswar from 12th Dec to 13th Dec, 2009. In this camp, the models of students

were evaluated by eminent scientists and the best 20 models were suitably awarded by the Hon'ble Chief Minister Sj. Naveen Pattnaik of Orissa on the eve of the 174th anniversary of Mahamahapadhyaya Chandrasekhar Singhsamant Harichandan Mohapatra on 13th Dec, 2009.

6.8 Various science popularization Programme

- a. A programme called "Learning Mathematics through Problem Solving" was organized on every Sunday in collaboration with The Book Point inside PSP premises for Class IV & V students.
- b. Group of SC and ST students from South Zone Berhampur, Central Zone Bhubaneswar, Northern Zone Sambalpur and Koraput Zone, Koraput of Orissa visited PSP on 07.04.09, 14.04.09, 21.04.09, 28.04.09, 05.05.09 respectively under scientific exposure visit conducted by SC & ST Development Department and Science & Technology Department.
- c. Every Sunday around 150 trainees from INS, Chilika visited P.S. Planetarium during the month of April, May & June, 2009 and witnessed Planetarium show.
- d. One day seminar on "Solar Eclipse" was held on 20th July, 2009 in the PSP auditorium. About 130 students and teachers from Bhubaneswar, Puri and nearby districts participated in the Seminar. In this meeting, the winners of the Painting & Quiz competition were awarded with cash prizes by the Chairman of PSP, who was the Chief Guest of the valedictory function.
- e. Arrangements were made for safe viewing of Solar Eclipse on 22nd July in PSP premises. About 3000 people gathered from the early morning.
- f. Two radio talks were broad cast through A.I.R., Cuttack in view of the Total Solar Eclipse, 2009 i.e. one day before and one day after the happening.
- g. One Chhayapath and one leaflet were published on behalf of P.S. Planetarium in view of the solar eclipse where members of staff of PSP and others contributed valuable articles.
- h. Live Programmes in TV Channels, Radio Channels in view of the Eclipse were arranged where members of staff of PSP participated actively.

- i. A Painting & one Written Quiz competition were held on 12th July, 2009 in the premises of Pathani Samanta Planetarium pertaining to Solar Eclipse. More than **four hundred students** participated in the competition.
- j. On 20.12.09 Centre for Environmental Studies & Environment Department, Govt. of Orissa organized a state level Sit & Draw competition for school and college students for the World Environment Day at PSP premises. About 1000 students from different area participated in this competition.
- k. Arrangements were made for safe viewing of partial Solar Eclipse on 15.01.2010. About 25000 people observe this rare celestial event through projection from telescope and binocular. Other equipments like Mylar sheet, Solar Specks were also provided to the visitors. The event was widely circulated to the general public through Newspaper and Electronic Media.
- l. Planetarium participated actively in the Annual Adivasi Mela – 2010 by opening a stall from 26th January -2010 with astronomical instruments, posters, telescopes. Leaflets, magazines were distributed free of cost to the public.
- m. Members of staff participated in the Block Level exhibition of Delang Block, Puri at Maharaj Maheswar High School, Badankula, Delang on 31.01.2010. Slide shows and Night Sky Watch programme was conducted for the students and general public.
- n. The 21st Annual Day Celebration was conducted in the premises of Pathani Samanta Planetarium on 8th of January, 2010. Sri S.P. Thakur, Commissioner-cum-Secretary to Government, Science and Technology Department & Chairman, PSP attended the function as the Chief Guest and gave away the prizes to the winning students of different competitions. A leaflet on Samanta Chandrasekhar & Pathani Samanta Planetarium was inaugurated by the Chief Guest.

7. ORISSA BIGYAN ACADEMY (OBA)

During the Year 2009-10 Orissa Bigyan Academy has organised different popular science programme as follows:

- 7.1. "Bigyan Diganta", the monthly Science Magazine, specially designed for school students and for their parents and other rural people is being continuously published by the Orissa Bigyan Academy since 1993. During 2009-10 twelve issues of "Bigyan Diganta" have been released. The "Bigyan Diganta" has been distributed mainly to the High Schools of the State free of cost. Orissa Bigyan Academy is also publishing an abridged version of "Bigyan Diganta" in braille script for visually handicapped students of the state. The magazine is brought out as a quarterly publication and distributed to the blind students and their institutions. During 2009-10 two issues (1st and 2nd quarters) have been printed and released. Rest two issues relating to 3rd & 4th quarters shall be released soon after receipt from the braille press, Berhampur.
- 7.2 Orissa Bigyan Academy organised a workshop on science writing with special reference to write for "Bigyan Diganta" on 17.05.2009 at Regional Science Centre, Bhubaneswar. The purpose of the workshop was to improve the quality of popular science writing for "Bigyan Diganta" published by Orissa Bigyan Academy. The eminent popular science writers of Orissa were attended the said Workshop and gave their views.
- 7.3 Orissa Bigyan Academy has launched its own **website** www.orissabigyanacademy.nic.in on 21.07.2009. The website was inaugurated by Shri P. K. Mohapatra, IAS, Commissioner-cum-Secretary to Government, IT and Science & Technology Department, Government of Orissa.
- 7.4. Orissa Bigyan Academy organised the investiture ceremony of different Awards of Orissa Bigyan Academy for the year 2007 at Jaydev Bhawan, Bhubaneswar on 18.01.2010 at 11.00 a.m.. Hon'ble Chief Minister of Orissa, S.J. Naveen Patnaik graced the occasion as Chief Guest and conferred the Awards. Hon'ble Minister of Information Technology, Science & Technology Department, Orissa, S.J. Ramesh Chandra Majhi was the Guest of Honour. The award winners are as follows :-

BIJU PATNAIK AWARD FOR SCIENTIFIC EXCELLENCE - 2007:

Prof. Lalit Mohan Patnaik,

Vice-Chancellor, Defence Inst. of Advanced Tech. (DIAT), Deemed University, Girinagar, Pune and

Prof. Jnanadeva Maharana,

Sr. Professor, Institute of Physics, Bhubaneswar.

SAMANTA CHANDRA SEKHAR AWARD - 2007

Scientists Working Within State

Life Science:

Dr. Anath Bandhu Das,

Senior Scientist, Regional Plant Resource Centre, Nayapalli, Bhubaneswar

Engineering & Technology:

Dr. Atmaram Mishra,

Principal Scientist, Water Technology Centre for Eastern Region, ICAR, Chandrasekharpur, Bhubaneswar

Oriya Scientist Working Outside State

Prof. Ramnath Misra,

Professor, Clinical Immunology, Department of Clinical Immunology, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Raebarli Road, Lucknow

ORISSA YOUNG SCIENTIST AWARD - 2007

Life Science:

Dr. Rabindra Kumar Mishra,

Fast Track Research Scientist, Department of Botany, Utkal University, Vani Vihar, Bhubaneswar

Engineering & Technology:

Dr. Subhransu Ranjan Samantaray,

Asst. Prof., Deptt. of Electrical Engineering, National Institute of Technology, Rourkela

POPOPULAR SCIENCE WRITERS AWARD - 2007

1. Dr. (Smt.) Kalyani Dash,

Plot No. -4933,

Tankapani Road, Bhubaneswar

2. **Er. Mayadhar Swain,**
Asst. General Manager (PP and EE Section MECON Ltd.), E-42, "SYAMALI", Doranda, Ranchi, Jharkhand
3. **Dr. Bhagabat Prasad Das,**
At: Madhipur, Po: Remuna, Dist: Balasore

SENIOR SCIENTISTS OF ORISSA FELICITATED FOR THE YEAR - 2007

Prof. Kulamoni Samal,
Samal Nivas, Majhi Sahi, Jobra, Cuttack

Prof. Sodananda Torasia,
C-102, HIG Duplex, Palaspali, Bhubaneswar

Prof. Anadi Charan Dash,
Plot No.-14(P)/369, Gajapati Nagar, Bhubaneswar

7.5 The National Science Day - 2010 was celebrated by Orissa Bigyan Academy at Raja Chaitanya Dev High School, Nabarangapur on 27.02.2010 and 28.02.2010. In this occasion science based project exhibition, essay & debate competitions were conducted. School children and teachers of different high schools participated in this function. This year Prof. Parsuram Mishra Award for best Science based project, Prof. Tribikram Pati Award for best Science based Essay and Prof. Bhubaneswar Behera Award for best Science based Debate were given to three different students for the excellent performance in the above competitions, alongwith Rs. 1,000/- (Rupees one thousand only) cash prize and a certificate of merit to each by the Chief Guest, S.J. Ramesh Chandra Majhi, Hon'ble Minister, Information Technology, Science & Technology, Orissa. Prof. (Dr) Nityananda Swain, Professor (Retd.), S.C. B. Medical College, Cuttack delivered the popular talk on the theme of the "National Science Day-2010" to the students, guide teachers participated and general public. The theme for the National Science Day-2010 was "Gender Equity for Prosperity with Peace".

8. INSTITUTE OF MATERIAL SCIENCES (IMS)

Followings are the brief activities report of the Institute of Materials Science for the year 2009-10.

8.1. Institute has created basic experimental research facilities for young researchers of the state to carry out research work in the frontier field of material sciences & engineering leading to their Ph.D programme. A few high precision equipment (High temperature programmable vacuum furnace & UV-VIS-NIR Spectrophotometer) are procured for this purpose.

8.2. A CSIR - NET qualified research scholar has joined in IMS availing the financial support from Govt. of India to pursue his research work in the broad area of ferroelectrics.

8.3. Basic research in the area of Multiferroics and Diluted magnetic Semiconductors are being taken up by the two research scholar of the Institute which have got tremendous impact in the field of future spintronics devices.

8.4. Microscopic analysis of rice and rice husk of Orissa (collected from different parts of Orissa) were analyzed availing the experimental support of NRL, Washington DC under the guidance of Dr. B. B. Rath (Associate Director, NRL) in order to evaluate the biogenic toxicity detrimental to human health .

8.5. Three research papers on Diluted Magnetic Semiconductor & Colossal Magnetic Resistance were published in International journal.

8.6. One research scholar has developed a programme for X-Ray Diffraction analysis of different materials covering seven crystallographic system.

8.7. IMS completed the scientific exposure visit programme of 253 SC & ST school students situated in TSP zones of Orissa and awarded 5 best pride of the school award to them.

9. INSTITUTE OF MATHEMATICS AND APPLICATION (IM&A)

The Institute is making all effort to keep the standard of Mathematics of Orissa high in all India, level. Different activities for the year 2009-10 are as follows:-

9.1. Research Activity

New areas of research under taken by the Institute of Mathematics and Applications are:

- i) Cryptography
- ii) Stochastic Filtering and its Applications to Signal Process
- iii) Application of Stochastic Process to Mathematical Finance
- iv) Operator Theory
- v) Graph Theory and its applications
- vi) Combinational Optimization

9.2 Exchange programme

- i) The Institute of Mathematics and Applications has signed a memorandum of understanding with the Western Ontario University, Canada for exchange of research fellows. Under this Programme **Sri Kedarnath Senapati**, Research fellow of this Institute has visited the University of Western Ontario, Canada.
- ii) An understanding has already been reached with the **National Institute for Science Education and Research (NISER)** to have joint lecture programmes to be supported by the NISER.
- iii) An memorandum of Understanding has been reached with Abhilash Mishra, Metron College, Oxford on Science Education Initiative for training and nurture of rural meritorious school students of Orissa.

9.3 Seminar/Conference/Symposium

National workshop/conference were organized

- (i) On Operator Theory from 5.12.09 to 12.12.09
- (ii) On Graph Theory & its applications 1st phase from 17.12.09 to 23.12.09
- (iii) On Computational Finance from 26.2.10 to 28.2.10.

It has been planned to hold National level Conference/Seminar/Symposium on

- i) Harmonic Analysis
- ii) Stochastic Analysis
- iii) Astronomy
- iv) Graph Theory & its applications, 2nd phase

9.4 Teaching Programmes:

The Institute offers a Master Level Course in Computational Finance. This is the first of its kind in India. This has already started attracting financial institute. Students have already got lucrative job offers even before their result are published.

The Institute offers a B.Sc (Hons) in Mathematics & Computing. The aim of the course is to orient a student to take up a research course in mathematics. There are only four such courses in India. These children shall be able to go directly for their Ph.D after the B.Sc (Hons) in Mathematics & Computing. The National Board for Higher Mathematics, Department of Atomic Energy, Govt. of India has already given a grant to give five of such students a monthly scholarship of rupees 2500 per month till they complete their B.Sc(Hons). The number will be enhanced depending on what these children do after their B.Sc.

Students of Institute of Mathematics & Applications are competing with other students from all over India

Two students of 2nd year B.Sc. have been selected under Kishore Vaigyanik Proshahan Yojana (KVPY) of CSIR. This entitled each of them to a scholarship of Rs. 5000/-per month till they finish their Masters programme.

9.5. Search & Nurture Programme:-

The Institute has been running the **Rural Mathematics Talent Search Programme** since 2003. So far more than 1200 students have passed through this programme. Some of them have made it to International Olympiads winning medals and some of them have done extremely well in the high school certificate exams and pursuing their higher education in colleges like BJB college & Ravenshaw College.

9.6. Interactive Mathematics training Programme for Under Graduate and Post Graduate Students:

All over India it has been increasingly realized that there is a great exodus of young talents from pure science. It is needless to mention that this would also affect the research in applied Sciences and Technology.

Therefore, the Institute proposed to conduct a Mathematics Training Camp for about a month of about 60 undergraduate and first year Master's level students in an area of rural setting but selected from all over Orissa.

9.7. Sunday Morning Problem Solving Classes for School Children:

Every Sunday the Institute conducts Problem Solving classes for school children. In these classes the children were taught the techniques and methods of problem solving of non traditional and non routine types of mathematics problems which are not generally taught in their schools. Students of both urban and rural areas are attending these classes. A bus has been arranged for this purpose.

9.8 Teachers Training Programme:

The Institute took number of remedial steps for improving mathematics teaching and education in Orissa, of which Teachers Training Programme is an important aspect. The teachers are trained the techniques of problem solving of non traditional and non routine mathematics problem.

9.9. Programme for SC/ST students:

Special training programme will be taken for few non performing schools of KBK districts to enhance their performance.

9.10. Capacity Building Programme in Tribal area:

The Institute of Mathematics & Applications has been conducting various programme for capacity building for tribal schools in Koraput District only. The Government is fully aware of the fruits of the programme. There have been requests from other districts to extend this programme to their ST/SC schools. This will have a far reaching effect on the mathematical competence of ST/SC children.

9.11. Library:

A good set of standard books and journals were procured in the Institute of Mathematics & Applications, Bhubaneswar library to make it a reputed library of advanced study in Mathematics & Applications.

9.12. Special Training Programme for Tribal Students of KBK Districts:

A special training programme for +2 ST/SC students of KBK Districts have been undertaken by the Institute since academic session 2008-09 under which the students are given special coaching for Examinations of IIT/NISER/NIT & other reputed Institutions. Under this programme 22 ST/SC students of KBK Districts admitted in 2008-09 and 10 students are admitted in 2009-10.

9.13. Institute of Mathematics & Applications, Bhubaneswar coordinates for the scholarship programme for students perusing **P.G. in Basic Sciences** in State levels.