



GOVERNMENT OF ODISHA

**ANNUAL ACTIVITIES REPORT
FOR THE YEAR 2016-17
OF
SCIENCE & TECHNOLOGY
DEPARTMENT**

REPORT ON THE ACTIVITIES OF SCIENCE & TECHNOLOGY DEPARTMENT

FOR THE YEAR 2016-17

1. INTRODUCTION

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

- 1.1. To keep abreast of the latest developments in the field of Science & Technology and to take steps for dissemination of these among institutions, industries, research laboratories, Universities, scientists and technologists.
- 1.2. To co-ordinate the R&D Programs of different departments, industrial and research institutions and to ensure scientific and technical co-operation among these institutions and agencies.
- 1.3. To formulate and fund, research and application programs in the field of science and technology,
- 1.4. To encourage, develop and extend the use of renewable sources of energy including energy plantations.
- 1.5. To popularize Remote Sensing Technology and make effective use of it.
- 1.6. To popularize science and technology among students and the people so as to inculcate a scientific temper and attitude in them.
- 1.7. Promote and popularize appropriate rural technologies.
- 1.8. Development of Library cum Documentation Centre for Science & Technology.

1.9. Science & Technology communication through awareness promotion, support to Institutions for Seminars/Workshops etc., development of Science Centres and administration of Pathani Samanta Planetarium.

1.10. To conduct Science & Technology Entrepreneurship Development Programmes.

1.11. To undertake fundamental research in mathematics and its application.

1.12. 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 programs undertaken in the field of Science and Technology in the State. Various programmes implemented by State Council on S&T for 2016-17 are given below:

2.1 Scholarship at Post-Graduate Level on Basic Science

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 Odisha in Science and Technology Department is implementing a Scholarship programme @ Rs.2000/- per month for 200 students under the aegis of the State Council on Science and Technology.

2.2 Establishment of Sub-Regional Science Centres in the State

A Sub-Regional Science Centre is being set up at Mouza-Tukurla under Bhatli Tahasil in Bargarh District in the State, which is under progress. Further, steps are being taken up for setting up of 03 more Sub-Regional Science Centres at Bodapalasa in Keonjhar, Umuri near Jeypore, and Gopalpur and one Science Centre at Khandapada in the State under State Plan.

2.3 UNESCO- Kalinga Prize

The proposal for enhancement of UNESCO Kalinga Prize money from USD 20,000 to USD 40,000 has been approved by Government.

2.4 Award of Biju Patnaik Research Fellowship in Science

Government provides Biju Patnaik Research Fellowship in Basic and Applied Sciences to 10 students.

2.5 Financial support provided for holding State Level Science Exhibition

Financial support has been provided to Regional Science Centre, Bhubaneswar for holding a State Level Science Exhibition.

2.6 Establishment of Patent Information Centre in the State.

The State Council on Science & Technology has established a Patent Information Centre (PIC) in Odisha. 07 Nos. of workshops have been organised by Patent Information Centre of Science & Technology Department at different Universities and Research Institutes during 2016-17.

2.7 Financial support for holding seminars, workshops, conferences etc.

Financial support has been provided for holding seminars, workshops, conferences etc.

2.8 Research and Development projects in Basic and Applied Sciences

Finance assistance have been provided to 5 (five) Nos. of R & D Projects in Basic and Applied Sciences.

3. DEVELOPMENT OF BIOTECHNOLOGY

Biotechnology is a frontier area of technology with immense benefits to society in diverse areas such as food Security, Nutritional supplementation, Health-Care products 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.

- Biotechnology Policy Resolution -2016 has been announced to bring investment in Biotechnology Sector and promote education and research in Biotechnology.
- Different operational guidelines relating to Biotechnology Policy Resolution-2016 have been released.

- Government provides 10 Biju Patnaik Research Fellowship in Biotechnology.
- Government provides 02 Emeritus Fellowship in Biotechnology.
- Government provides financial assistance to Government Universities, Colleges, State funded Research Institute of Odisha and Research Institute of Government of India functioning in Odisha to support Research & Development Projects in Biotechnology.
- 32 scholarships are being provided to students pursuing Post-Graduation studies in Biotechnology in different Universities and Colleges of the State.
- Financial support is being provided for holding Workshops/ Seminars etc. on Biotechnology.
- Government provides travel grant to academicians/scientists to give oral presentation in National/ International Conference/ Seminars/ Workshops/ Symposia.

4. INSTITUTE OF MATHEMATICS AND APPLICATIONS (IM&A), BHUBANESWAR

The main aims and objectives of the Institute of Mathematics & applications are to pursue research in Mathematics & Applications , to search and nurture talents in Mathematics, to build a reference library and documentation centre, to set up advanced computing centre and to offer specialized courses.

4.1 Teaching Programme:

Teaching programme consists of B.Sc. (Hons) in Mathematics and Computing and M. Sc. (Computational Finance) with intake of 30 students in each course. The B.Sc. (Hons) course offered at the IMA has an edge over traditional B. Sc. (H) courses run at other place because a significant portion of the syllabus is devoted to higher studies on applications mathematics to modern developments of computers. Similarly, the M. Sc. Course is designed keeping in mind the mathematical requirements of stock market, risk managers and other financial institutions like insurance companies. Both the courses are rare in the country and students get better future prospects.

4.2 Nurture and Training Programme:

(A) The institute conducts nurture programs for talented school going students selected through Olympiad tests. Three such camps are conducted per year. Students trained in these camps compete at Indian National Mathematics Olympiad for earning fellowships offered for entire study career.

(B) Special nurture programmes are conducted for students of rural areas and those belonging to socially and economically backward sections of the society (SC/ST students included). At least two students from each block of Odisha selected through Pathani Samanta Medha Bruti tests are invited for participation in the camps.

(C) Interactive camps are organized for selected graduate students of Odisha. Students are given insight and taught problem solving methods leading to scope for research. Non- traditional teaching through interactive methods remains the focus on these camps.

(D) On Sundays the Institute conducts Problem Solving classes for school children. Students of both urban and rural areas are attending these classes.

4.3 Research

In the IMA research work is carried out in advanced areas like Stochastic Process, Mathematical Finance, Operator Theory, Computational Fluid Dynamics, Complex Analysis, Cellular Automata Theory, and so on. Faculties of the Institute have published 05 no. s of research papers in reputed International journals during the year under report. In addition to publication of research papers, one lecture note entitled "Non linear Functional Analysis" authored by P. C. Das is published by the Institute of Mathematics.

4.4 Conduct of Seminars/Workshop/Conference:

A National Workshop entitled "**Mat lab for Mathematical Applications**" was organized during 22nd to 23rd January 2017. Forty numbers of participants attended the lab oriented workshop. The Institute organizes Friday Seminars regularly with internal and external faculty. Faculty members were invited as keynote speaker/Resource Person/Session chair to the National seminars and Conferences. Faculty members have participated in different National seminars and Conferences to present their research papers.

4.5 Programme for SC/ST students:

The Institute of Mathematics & Applications was involved in mathematics workshop for both Junior and senior group in a state level student's festival "Sargiful" being organized by ST & SC Development Department, Govt. of Odisha held at Adivasi Ground, Bhubaneswar.

Various groups of tribal students (boys and girls) including their guide teachers (gents and ladies) visited Institute of Mathematics & Applications for scientific exposure.

4.6 Library:

Library of the Institute has more than 7000 references on mathematical, financial, computational and related subjects as well as professional journals, both national and international. This facility is being used by students, faculty and Research Scholars of the Institute and also teachers/ Research Scholars from other institutions of Odisha.

Students, faculties and Research Scholars use the computing facility along with high speed internet connectivity.

4.7 Summer Project:

Post graduate, B. Tech and under graduate students of different Institutes like NIT, Rourkela, Sambalpur University, Utkal University, Central University etc. come to the Institute of Mathematics & Applications for their summer project/internship.

4.8 Nodal Agency of State Level P.G Scholarship in Basic Sciences

Institute of Mathematics & Applications, Bhubaneswar coordinates for award of the scholarship offered by State Council on Science, Science & Technology Department, Govt. of Odisha to students perusing **P.G. in Basic Sciences** in the State.

5. INSTITUTE OF MATERIALS SCIENCE (IMS), BHUBANESWAR

The activities pertaining to various programs / schemes undertaken during the year 2016-17 are stated below:

(i) Proposal for starting two academic courses (leading to Master Course in Materials Science & Post Graduate Diploma in Advanced Materials Science : 1st time to be introduced in the State), has been prepared and submitted to S & T Department to appropriately staff the IMS which will also helpful for ongoing R & D activities of IMS.

(ii) A high precision magnetic measure VSM Instrument costing approximately **Rs.4.00 crores** has been procured from M/s. Quantum Design, USA and going to be installed by the Principal shortly in the new VSM laboratory located in the new PSP building.

(iii) Existing high temperature furnace laboratory of IMS located in the PSP shed has been renovated and equipped with sophisticated high temperature programmable vacuum furnace with adequate safety measures (fire extinguisher/electrical lines).

(iv) Experimental research collaboration between UNISA, South Africa (Prof. V.V. Srinivasu) and Naval Research Laboratory, USA (Dr. B.B. Rath) are continuing.

(v) Proposal for faculty (3 nos.) and supporting staff (5 nos.) for IMS is under active consideration of Finance Department, Govt. of Odisha.

(vi) Construction of IMS own Building over 2 acres of land located in the Chandrasekharapur area by IDCO is under the consideration of S & T Department for finalization of plan and estimate with administrative approval.

(vii) Four numbers of research papers of IMS are published in International Journal/ Conference.

(viii) Colloquium / invited talk organized by IMS:-

➤ Invited talk organized by IMS titled "Physics of Synchrotron Radiation and Application in Material Physics and Biomedicines" delivered by **Prof. G.K. Sahoo**, Deutsches Electron Synchrotron (DESY), **Hamburg, Germany** on 22.07.2016.

➤ Invited talk organized by IMS titled "Advanced Multilayer Functional Material for Smart Applications" delivered by **Prof. A.K. Pradhan**, Director, CREST Centre for Nano And Bio-Inspired Materials and Devices (CNBMD), **Norfolk State University, USA** on 11.11.2016.

➤ Invited talk organized by IMS titled "Superconductivity: 105 years of its Discovery" delivered by **Prof. M.P. Das**, Research school of physics and Engineering, **Australian National University, Australia** on 19.12.2016.

➤ Invited talk organized by IMS titled "Electro chromic Materials for Smart Window Applications" delivered by **Dr. Diptiranjana Sahu**, Department of Natural and Applied Sciences, **Namibia University of Science & Technology, Windhoek, Namibia** on 04.01.2017.

(ix) One International Conference has been attended by IMS researcher.

(x) Ph.D research scholars.

➤ **Mr. Biswaranjan Mohanta** registered (05-Physics-2012-13) in Utkal University, Bhubaneswar is doing his research work on "Development of Yttria Stabilized Zirconia (YSZ) based anode materials for Solid Oxide Fuel Cell (SOFC) application".

➤ **Mrs. Basanti Behera** registered (07-Physics-2012-13) in Utkal University, Bhubaneswar is doing her research work on "Study of Ion Beam Induced Epitaxial Crystallization of Germanium".

➤ **Ms. Madhusmita Sahu** doing her research works on "Development of CCTO Ceramics for Achieving Enhanced IBLC Effect in Supercapacitor and Magnetic Supercapacitor Device" yet to be registered.

➤ **Mrs. Sasmita Otta** doing her research works on "Studies on Multiferroic behavior of doped BCZT ceramics" yet to be registered.

(xi) Outsider researchers of IOP, OUAT, IMMT, Utkal University, ITER, CET and Silicon College of Engineering, Bhubaneswar are using the research facilities of IMS.

(xii) A state need based collaborative applied research programme on rice husk of Malud area has been done with the eminent scientists (Dr. B.B. Rath and Dr. S.B. Quadri) from NRL, Washington, DC, USA. Report approved in The New Indian Express.

(xiii) Apart to above, value addition of waste cashew shell of Odisha has also been taken up recently by IMS with above group.

(xiv) Two M. Sc. (Tech.) students from CIPET, Bhubaneswar are carrying out their semester projects in IMS.

6. PATHANI SAMANTA PLANETARIUM (PSP), BHUBANESWAR

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 Odisha.

(i) Pathani Samanta Planetarium, Bhubaneswar was inaugurated on 8th of January, 1990. Since its inauguration, PSP has increased its activities manifold and it has established a link throughout the state. Various programmes are being conducted throughout the year. The number of visitors and revenue collected for last five years are given below.

Visitor & Revenue Collection

SI No	Year	Visitors Visited	Revenue received from sale of tickets in Rupees (Rs.)
1	2012-13	1,51,508	26,88,914/-
2	2013-14	1,55,516	27,96,520/-
3	2014-15	1,57,299	29,57,285/-
4	2015-16	1,68,618	32,27,163/-
5	2016-17(Up to 24 th Feb-	1,36,599	32,08,515/-

(ii) The main objectives and function of the Planetarium are to bring to the public the awe and wonders of the universe through the planetarium shows. At present, Pathani Samanta Planetarium is showing planetarium shows in three distinct languages with different programmes of duration range from 25 to 40 minutes such as (i) ଆକାଶର ଅସରଟି କଥା (in odia) (ii) ବିଶ୍ୱର ରହସ୍ୟ (in Hindi) and (iii) IBEX : Search for the edge of the Solar System (in English). In the open air, the Astronomy Park established in the premises of PSP with many astronomical models are being appreciated by student community, teacher community & general public. Like every year, this year on 13th December, 2016, on the birth Anniversary of Pathani Samanta, 20 selected Young Astronomers of the state were awarded by the Hon'ble Chief Minister of Odisha. Students covering all most all districts of Odisha participated in the YATS programme. They are encouraged to pursue their career in Science in general, Astronomy, Astrophysics & Space Science in particular and take up future research activities to build the nation and create mile stone in space exploration. In the open air, the Astronomy Park established in the premises of PSP with many astronomical models are being appreciated by student community, teacher community and general public. The theme of the Astronomy Park is " Play and learn, Astronomy is fun".

(iii) Besides presenting Planetarium shows, PSP has taken up a no. of activities for popularization of science specifically Astronomy and development of scientific spirit

among the people in the state. Further, it is also engrossed in research and development works which include Night Sky Watch (NSW) programme, Astronomy Olympiad, demonstration of astronomical models, workshops etc.

(iv) The work of Planetarium at Burla is in progress and three more Planetarium are to be set up at Raygada, Mayurbhanj and Ganjam.

7. ODISHA BIGYAN ACADEMY (OBA), BHUBANESWAR

The aims and objectives of Odisha Bigyan Academy (OBA) are to promote and popularize science, amongst people of Odisha, based on informed knowledge emanating from various frontier fields of Science & Technology.

Physical achievement report during the year 2016-17 of Odisha Bigyan Academy is as follows:

- I. Monthly popular science magazine 'Bigyan Diganta' (Odia) published regularly and distributed to Government recognised High Schools of Odisha, free of cost every month.
- II. Monthly popular science magazine 'Science Horizon' in English published regularly and distributed to Government English medium High Schools, Government +2 Science Colleges and +3 Degree Colleges of Odisha free of cost every month.
- III. Abridged version of Quarterly Science magazine 'Bigyan Diganta' in Odia braille script published regularly and distributed to institutions and visually handicapped students of Odisha.
- IV. Odisha Bigyan Academy (OBA) celebrated its foundation day on 01.04.2016 (Utkal Divas). On this occasion, Quiz competition based on articles published in 'Bigyan Diganta' during 2015 and Sit & Draw Competitions were conducted among the High School Students of Odisha and participants interacted with the eminent Scientists of Odisha.
- V. Odisha Bigyan Academy organised a Writers Workshop for writing in 'Bigyan Diganta' and 'Science Horizon' at its Conference Hall on 17.09.2016. The purpose of the workshop was to improve the quality of science writing for 'Bigyan Diganta' & 'Science Horizon' published by Odisha Bigyan Academy. Many renowned writers in science of Odisha were the resource persons for the said Workshop and suggested their views.

- VI.** The meeting of the Expert Panel in different disciplines was held at Bhubaneswar on 09.11.2016 for selection of Pranakrushna Parija Popular Science Book Award 2014. The members of the Expert Panel handed over the final recommendation of above Award to the Secretary, Orissa Bigyan Academy.
- VII.** Odisha Bigyan Academy organised a Popular Science Talk on **World Science Day for Peace and Development** on 10.11.2016 in the Conference Hall of Odisha Bigyan Academy, Bhubaneswar.
- VIII.** For selection of Biju Patnaik Award for Scientific Excellence, Samanta Chandra Sekhar Award and Orissa Young Scientist Award 2014, the meeting of the Expert Panel in different disciplines was held at Bhubaneswar on 19.11.2016 to 21.11.2016. The members of the Expert Panel handed over the final recommendation of above Awards to the Secretary, Orissa Bigyan Academy.
- IX.** Odisha Bigyan Academy celebrated '**World Disability Day**' on 03.12.2016 in the Conference Hall of Odisha Bigyan Academy, Bhubaneswar.

District Level Interactive Sessions of Science Teachers and Students was organised by Odisha Bigyan Academy at Bhubaneswar on 21.01.2017 and 22.01.2017. Students and Science Teachers of all the 30 districts have participated and interacted with eminent scientists of Odisha in those sessions.

8. ODISHA SPACE APPLICATIONS CENTRE (ORSAC), BHUBANESWAR

The activities of the ORSAC for the year 2016-2017 are the following:

I. Block level resource atlas & GIS database generation:

The mobile application under 'Odisha Sampad' has been developed. The thematic content of the same is being updated with information on mines, tourism and industries.

II. Urban land information system:

Landuse/land cover map updation of Pattamundai, Jagatsinghpur, Jajpur, Joda, Nayagarh, Deogarh, Paralakhemundi, Boudh, Sonapur, Koraput, Malkangiri, Nawarangpur and Sundargarh has been completed.

III. EDUSAT Programme:

Classroom teaching transmission on English, Mathematics, Science & Geography has been made for Class IX and X students for 64 days covering 175 classes from April 2016 to February, 2017.

IV. DGPS Survey of Mining Lease Areas:

DGPS survey for 40 (forty) Iron & Manganese lease area of the state has been completed under joint survey exercise.

V. Forest Area Proposed For Diversion / Compensatory Afforestation Projects:

Authentication of maps showing forest areas proposed for diversion for 102 proposals have been completed. DGPS survey has also been completed for 23 proposals.

VI. FASAL Project:

The kharif rice acreage and production forecast for Odisha state has been released in collaboration with Mahanalobis National Crop Forecast Centre (MNCFC), Ministry of Agriculture and Farmers Welfare, Govt. of India, New Delhi. The kharif rice area of the state is estimated at 3.63 million ha. with a production of 6.38 million tone.

VII. Odisha Land Bank Project:

Land bank clusters of 95000 acres have been web hosted along with pollution potential indicator index. This programme received the Special Achievement in GIS (SAG) award from ESRI for the year 2016.

VIII. Research & Development Projects:

The Digital Image Processing and GIS soft wares procured under R&D project such as ENVI, TNT MIPS, Intergraph Geospatial Server (IGS), Arc GIS Advanced Server and Terrago Geo PDF have been studied in detail relating to their interoperability in data handling.

IX. Odisha Industrial Infrastructure Webgis Database (GOiPLUS):

GoiPLUS version 2.0 has been webhosted in public domain and updated with the inputs from Industries Department, Government of Odisha. This project received Geospatial World Excellence Award-2016 conferred by Geospatial World Forum.

- X. Development Of Odisha Irrigation Infrastructure Web Portal:**
Scanning and digitization of ayacut maps collected from various government departments is in progress.
- XI. Groundwater Quality Mapping:**
Groundwater quality mapping for Angul, Kendrapada, Bargarh, Khurda, Rayagada, Jagatsingpur and Malkangiri districts have been completed and submitted to RWSS, Government of Odisha.
- XII. CHAMAN Project:**
Groundtruth has been collected for Chilli crop from Ganjam, Sambalpur, Cuttack and Kalahandi district and same for tomato crop from Keonjhar, Khurda, Kalahandi, Mayurbhanj and Ganjam district. The database for both the crops has been prepared.
- XIII. Working Plan Input Map Preparation Of Odisha Using Rs&Gis:**
Forest Administrative, Management and Forest density mapping for 20 divisions has been completed. Sample point maps have been submitted to Forest Department for forest inventory.
- XIV. Natural Resources Survey – 63rd cycle:**
Mapping of land use, wasteland and land degradation of the state using satellite image of 2015-16 is in progress.
- XV. Land Information System For GA Department, Govt. Of Odisha:**
GIS database development for 62 Municipal wards of Bhubaneswar has been completed. Web-portal has been developed. Training has been conducted for Officers & staff of General Administration Department.
- XVI. Planning Of Routing Of OFC Under Bharat Net (Phase-II):**
The mobile application for routing of aerial OFC has been developed and web hosted.
- XVII. Monitoring of Afforestation/ Plantation In Odisha:**
Mapping of status of plantations for 15 Forest Divisions of Odisha has been completed.

XVIII. Odisha Spatial Data Infrastructure (OSDI):

ORSAC has identified a System Integrator (SI) to execute the project. A workshop on requirements of spatial layers with other attributes linked with the respective layers for the Govt. Departments was held to understand the requirement of GIS layers for smoothening day to day activities of the Departments. Spatial data layer compilation and preparation of metadata of the respective layers is in progress.

XIX. Power Atlas Generation For Rest Of Odisha:

The survey of Electrical Infrastructures of OPTCL has been completed. The E-shakti data for the feeder lines has been compiled to study the data gap. Survey of additional feeder lines as required by OPTCL is in progress.

9. ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY (OREDA), BHUBANESWAR

- **National Biogas & Manure Management Programme:-** Under the Scheme, family type Biogas plants of capacity of 2 cum. each are being constructed in order to meet cooking & lighting need of the household. Besides, the plant supplied enriched manure. So far, 2.41 lakhs plants have been constructed with the financial support in terms of subsidy of the MNRE. In Financial Year 2016-17, 966 Nos of Plants were installed till date.
- **Special Area Demonstration Programme:-** The scheme has an objective of demonstrating application of various renewable energy systems in National/ International importance location including heritage sites. SPV power plants of capacity of 150 KWp are under installation in Raj Bhawan, Ravenshaw University and 5 Collectorates during 2016-17.
- **Dual Pump Drinking Water Supply Programme:** Objective of the programme is to supply drinking water to the villages through SPV pumping system which is fitted with the existing tube well. So far 6464 nos projects have been installed. During 2016-17, 1078 nos. of projects were installed till date and 1111 nos work orders have been issued during 2016-17. Further, MNRE. Govt. of India has awarded First prize to OREDA in the state category and 1st, 2nd, 3rd rank to three districts namely, Sundargarh, Mayurbhanj and Dhenkanal respectively in the district category for the achievement of installation of Solar Pump for Drinking Water under Off-grid programme during 2015-16.

- **Solar Water pumping programme for Irrigation:** To provide irrigation facilities for round the year cropping programme, two types of pumps i.e 3 HP & 5 HP have been provided to farmers. In 2016-17, 13 nos of 5 HP and 572 Nos of 3 HP pumps have been installed in the farmer's field. Besides, work orders for 163 Nos of 5 HP pumps as well as 1992 nos of 3 HP pumps have been issued. Work is under progress and will be completed very soon.
- **Off-grid Rooftop Solar Power Plant:** Under the programme, electricity is being provided to the house hold/ Ashram Schools/ Office Buildings/PHC/CHC/ Private Institutions/ Police Stations for illumination and operation of other electrical appliances. .During, 2016-17, 701 KW capacity SPV power plants have been installed. Besides, work orders for electrification of 147 nos Tribal Schools with a capacity of 10 kw each along with provision of 10 nos of Street Lighting Systems have been issued. Also, work orders for 39 locations with a capacity of 252.5 kw have been issued which are under progress.
- **Distribution of Solar lanterns:** To provide extended working hours to artisans of Handloom and Handicraft sector, 63220 nos solar lanterns have been distributed till date. In 2016-17, 6821 nos of lanterns have been distributed. Besides, OREDA has been awarded THIRD prize in the country in distribution of Solar Lantern category by MNRE, Govt. of India during 2015-16.
- **Solar lighting to Tribal Villages under TSP Area:** A total of 92 villages have been electrified in 2016-17 under TDCCOL.
- **Unnat Chullah Abhiyan:** To provide cleaner cooking energy and to mitigate climate change 247 nos of Unnat Chullahs have been supplied by OREDA among which 135 nos in 2016-17.
- **Parishad Chullah Abhiyan:** These were installed in School under Mid-Day Meal programme. Till date, 9800 nos have been installed among which 2500 nos in 2016-17.
- **Suryamitra Skill Development Programme:** To provide skilled manpower in Solar Energy Sector, 420 nos Suryamitras had completed training in the approved organization till date of 2016-17.
- **DDG Under DDUGJY:** A total of 406 villages have been indentified for electrification under Decentralised Distributed Generation under Deen Dayal Upadhaya Gram Jyoti Yojana during 2016-17 out of which work orders for 274 villages have been issued.

- **Solar City Programme:** Bhubaneswar has been considered under the programme for which draft master plan prepared by BMC is being modified for obtaining approval of the MNRE.
- **Green Campus Development under Solar City Programme:** KIIT University have been selected by MNRE for development of their campus under the programme. DPR is under preparation by KIIT.
- **Renewable Energy Policy 2016:** Government of Odisha has introduced Renewable Energy Policy 2016 with an objective to reduce dependence on conventional sources of power generation, protecting the environment, generation of employment in large scale, generation of grid-quality power, encourage entrepreneurial investment and to extend such rational fiscal and promotional incentives so as to provide conducive atmosphere to private investment.

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