



## Department of Environmental Sciences, Sambalpur University Evaluative Report for the period 2010-11 to 2014-15

1. **Name of the Department :** P.G. Department of Environmental Sciences
2. **Year of establishment :** 1989
3. **Is the Department part of a School/Faculty of the university?** Yes, part of Science Faculty of the University
4. **Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.) :**

Programme	Name	Intake per Annum
M.Sc.	Environmental Science	18
M.Phil.	Environmental Science	8
M.Tech.	Environmental Science and Engineering	16

*\*20% seats in any year can be increased with approval from Syndicate*

5. **Interdisciplinary programmes and departments involved :**  
In the last five years the Departments have been involved in teaching Environmental Science and some relevant topics in the following Departments and institutes
  - a. School of Life Science, Sambalpur University
  - b. Sambalpur University Institute of Information Technology (SUIIT), Sambalpur University
  - c. Department of Home Science, Sambalpur University
  - d. School of Chemistry, Sambalpur University
  - e. Department of Earth Sciences, Sambalpur University
6. **Courses in collaboration with other universities, industries, foreign institutions, etc. :**  
Nil
7. **Details of programmes discontinued, if any, with reasons :** Nil
8. **Examination System: Annual/Semester/Trimester/Choice Based Credit System :**  
Semester System
9. **Participation of the department in the courses offered by other departments :**  
In the last five years the faculty of the Departments have been involved in teaching various courses in the following Departments and institutes
  - a. School of Life Science, Sambalpur University: Topics: Vermitechnology; Remote Sensing and GIS.
  - b. Sambalpur University Institute of Information Technology (SUIIT) , Sambalpur University: Paper: Environment and Management
  - c. Department of Home Science, Sambalpur University: Paper: Environment and Management
  - d. School of Chemistry, Sambalpur University: Paper: Environment and Management in Industrial Chemistry
  - e. Department of Earth Sciences, Sambalpur University: Paper: Geochemistry in M.Sc. Applied Geology; Paper: Environment in the M.Tech in Geospatial Technology.

**10. Number of teaching posts sanctioned, filled and actual (Professors/Associate Professors/Asst. Professors/others)**

	Sanctioned	Filled	Actual (including CAS & MPS)
<b>Professor</b>	1	1	1
<b>Reader</b>	1	1	1
<b>Lecturer</b>	2	1	1 position is advertised
<b>Lecturer (Contractual Basis)</b>	Nil	2	2

**11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance:**

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D/M.Phil students guided in the last 5 years
Dr. P.C. Mishra (Retired on January, 2013)	M.Sc., M.Phil, Ph.D., D.Sc.	Professor	Waste water Management, Environmental Monitoring and Eco-Toxicology, Environmental Management	Teaching: 30 yrs Research: 25 years	D.Sc.-1 Ph.D.-3 M.Tech.-2 M.Phil.-3
Dr.S. K. Sahu	M.Sc., M.Phil, Ph.D.	Professor	Soil Chemistry and Soil Biology, Vermitechnology	Teaching: 30 yrs Research: 25 years	Ph.D.-6 M.Tech.-25 M.Phil.-9
Dr. S. K. Pattanayak	M.Sc., Ph.D.	Reader	Geochemistry, Environmental Geology, Remote Sensing and GIS, EIA	Teaching: 6 yrs Research: 15 years	M.Tech.-18 M.Phil.-10
Dr. M. R. Mahananda	M.Sc., M.Phil, M.Tech, Ph.D.	Lecturer	Environmental Toxicology	Teaching: 10 yrs Research: 15 years	M.Tech.-8 M.Phil.-10
Dr. R. Panda	M.Sc., M.Tech, Ph.D.	Lecturer (Contractual)	Environmental Biotechnology	Teaching 5 yrs Research: 4 years	Nil
A. K. Bhadra	M.Sc., M.Phil	Lecturer (Contractual under M.Tech. in ESE)	Plant Biodiversity	Teaching 5 yrs	Nil

**12. List of senior Visiting Fellows, adjunct faculty, emeritus professors :**

Prof. Niranjana Behera, Retired Professor of School of Life Science – Emeritus Fellow (UGC)

**13. Percentage of classes taken by temporary faculty – programme-wise information:**

Programme	Student to permanent teachers ratio				
	2010-11	1011-12	2012-13	2013-14	2014-15
M.Sc. Environmental Science	10%	10%	15%	15%	15%
M.Phil. Environmental Science & Ph.D. Course work	Nil	Nil	Nil	Nil	Nil
M.Tech in Environmental Science and Engineering	15%	15%	20%	20%	20%

**14. Programme-wise Student Teacher Ratio :**

Programme	Student to permanent teachers ratio				
	2010-11	1011-12	2012-13	2013-14	2014-15
M.Sc. Environmental Science	4.5	4.5	4.75	7.33	6.66
M.Phil. Environmental Science & Ph.D. Course work	2.25	2	1.5	2.66	1.66
M.Tech in Environmental Science and Engineering	4.75	4.5	4.5	5.66	6.33

**15. Number of academic support staff (technical) and administrative staff: sanctioned, filled and actual:**

Support Staff Category	2010-11			1011-12			2012-13			2013-14			2014-15		
	S	F	A	S	F	A	S	F	A	S	F	A	S	F	A
Group-C (Technical)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Group-C Administrative	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Group-D Technical	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Group-D Administrative	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Group-D Self-Financing	1	Nil	Nil	1	Nil	Nil	1	1	1	1	1	1	1	1	1

S-Sanctioned, F-Filled, A-Actual

**16. Research thrust areas as recognized by major funding agencies:**

- Soil Ecology
- Environmental Pollution
- Environmental Toxicology
- Environmental Impact Assessment

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise:

Name of the Faculty members as Investigators	Title of the Project	Funding Agency	Amount (Rs. In Lakhs)	Duration (Present Satus)
Prof. P.C. Mishra (PI) Dr. M.R. Mahananda (Co-PI)	Bioremediation of poultry waste induced arsenic contamination in soil by tropical earthworm	UGC, New Delhi	8.60 Lakhs	2009-2012 (Completed)
Dr. M.R. Mahananda (PI) Prof. P.C. Mishra (Co-PI) Dr. P.K. Chaturvedy (Co-PI)	Occupational exposure of coal dust and its effect on male fertility status	ICMR, New Delhi	9.75 Lakhs	2009-2012 (Completed)
Prof. P.C. Mishra (PI) Prof. S.K. Sahu (Co-PI) Dr. M.R. Mahananda (Co-PI) Dr. S.K. Pattanayak (Co-PI)	Impact of Fluoride on native crops in five kilometre radius of Vedanta Alumina, Jharsuguda	Vedanta Alumina Ltd. Jharsuguda	3.9 Lakhs	2009-2012 (Completed)
Prof. S.K. Sahu (PI)	Biodiversity study of three patches of plantation Undertaken by Sesa Sterlite Limited in Jharsuguda, Odisha	Sesa Sterlite, Jharsuguda	3.70 Lakhs	1.6.2014-30.9.2014 (Completed)
Prof. S. K. Sahu (PI) Prof. N. Behera Retd. & Dr. S. P. Mishra	Biodiversity study of three patches of plantation (Lahandagud, Beherapat, & Banjari) Undertaken by Vedanta Aluminium Limited in Jharsuguda, Odisha	Vedanta Aluminium Industries Ltd., Jharsuguda	3.70 Lakhs	2013-2014 (Completed)
Dr. S. P. Mishra (PI) Prof. S. K. Sahu (Co-PI) Prof. N. Behera Retd. & Prof. M.C. Dash Retd.	Biodiversity Study of Malingtoli Iron Ore Deposits Leased to Mesco Steel Limited	Mesco Steel Limited, Bhubaneswar	15.75 Lakhs	2015-16 (Continued)

**18. Inter-institutional collaborative projects and associated grants received:**

**a) National collaboration:**

Name of the Faculty members as Investigators	Title of the Project	Funding Agency	Amount (Rs. In Lakhs)	Duration (Present Satus)
Dr. M.R. Mahananda (PI) Prof. P.C. Mishra (Co-PI) Dr.P.K. Chaturvedy (Co-PI), ICMR, New Delhi	Occupational exposure of coal dust and its effect on male fertility status	ICMR, New Delhi	9.75 Lakhs	2009-12 (Completed)

**b) International collaboration: Nil**

**19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received :**

The Department received DST-FIST grant during 2002 (Amount Rs. in Lakhs- 20.0 )

**20. Research facility / centre with recognition:**

**State recognition :** Environmental pollution study

**National recognition:** Nil

**International recognition :** Vermitechnology

**21. Special research laboratories sponsored by / created by industry or corporate bodies: Nil**

**22. Publications:**

Type	No. of Publications (Refer Annexure –I)				
	2010-11	2011-12	2012-13	2013-14	2014-15
Research papers published in peer reviewed journals (International)	10	7	14	16	14
Research papers published in peer reviewed journals (National)	4	6	7	9	5
Monographs published	1	0	1	0	0
Chapters in Books	0	0	2	0	5
Books Edited	0	6	0	1	0
Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.)	14	14	21	25	19

- 23. Details of patents and income generated : Nil**
- 24. Areas of consultancy and income generated:**
- Evaluation work of National Afforestation Programme of FDA, Sambalpur run through V.S.S. from 2009-10 to 2012-13 under 11<sup>th</sup> Plan Period” funded by Divisional Forest Officer, , Sambalpur Forest Division (Undertaken: in October 2013, Rs.75,000/-, Investigators: Dr. S. K. Sahu & Dr. S. K. Pattanayak.
  - Evaluation work of National Afforestation Programme of FDA, Rairakhol run through V.S.S. from 2012-13 to 2014-15 under 11<sup>th</sup> Plan Period” funded by Divisional Forest Officer, , Rairakhol Forest Division (Undertaken: in October 2014, Rs.15,000/-, Investigators: Dr. S. K. Sahu ,Dr. S. K. Pattanayak& Dr. M. R. Mahananda.
- 25. Faculty selected nationally / internationally to visit other laboratories/ institutions /industries in India and abroad :**
- Prof. S.K. Sahu was invited as a **Plenary Speaker** for the International Conference on World Biodiversity Congress organized by Global Scientific Research Foundation at Colombo , Sri Lanka from 24-27<sup>th</sup> November 2014.
  - Dr. S.K. Pattanayak was invited as a **Resource Person** to deliver lectures to the Mahanadi Coalfield Limited Executives at Bandhabahal Training Institute on the subjects i) Development and Sustainability, ii) Corporate Sustainability and iii) Sustainability assurance
  - Dr. M.R. Mahananda was invited as a **Resource Person** to deliver lectures to the Mahanadi Coalfield Limited Executives at Jagruti Vihar, Burla on Overview of the Environmental Impact Assessment process.
- 26. Faculty serving in :**
- National committees**
    - Prof. S.K. Sahu and Dr. S.K. Pattanayak were acted as **Expert members** in the UGC –NET Question Setting Work shops during 2010-2015.
  - International committees:** Nil
  - Editorial Boards**
    - Prof. S.K. Sahu, Dr. S.K. Pattanayak and Dr. M.R. Mahananda acted as **Reviewers** of International Journals during 2010-2015.
  - any other (please specify)**
    - Prof. S.K. Sahu was an Expert member in the National Committee to Examine the Fluoride Contamination of Paddy fields around Hirakud
    - Prof. S.K. Sahu has been elected as a Syndicate (Apex body) member of the University
- 27. Faculty recharging strategies (UGC, ASC, Refresher / orientation programs, workshops, training programs and similar programs):**

**A. Participation by the Faculties (Number):**

**As participant**

Programme	2010-11	2011-12	2012-13	2013-14	2014-15
Training	-	2	-	-	-
Orientation Programme	-	-	-	-	-
Workshop	6	6	5	5	5
Refresher Course	-	-	1	-	-

**As Resource Person**

Programme	2010-11	2011-12	2012-13	2013-14	2014-15
Training	1	2	2	2	2
Orientation Programme	3	3	2	2	2
Workshop	3	3	2	2	2
Refresher Course	3	3	3	2	2

**B. Organised by the Department (Number):**

Programme	2010-11	2011-12	2012-13	2013-14	2014-15
Conferences	1	-	-	-	-
Seminar	1	-	1	-	-
Workshop	-	2	1	-	1
Orientation Course	-	-	-	1	-
Refresher Course	1	1	2	2	1

**28. Student projects:**

	Programme	2010-11	2011-12	2012-13	2013-14	2014-15
<b>Percentage of students who have done in-house projects including inter-departmental projects</b>	M.Phil. in Environmental Science	100%	100%	100%	100%	100%
	M.Tech. in Environmental Science and Engineering	47%	60%	53%	18%	52%
<b>Percentage of students doing projects in collaboration with other universities industry / institute</b>	M.Phil. in Environmental Science	100%	100%	100%	100%	100%
	M.Tech. in Environmental Science and Engineering	53%	40%	47%	82%	48%

**29. Awards / recognitions received at the national and international level by Faculty:****Doctoral / post doctoral fellows : Students :****Prof. S.K. Sahu**

1. Fellow of Environmental Research Academy, International (2010)
2. Fellow of National Environmentalists Association (2010)
3. Life Member of Odisha Bigyan Academy (2013)
4. Best Senior Scientist Award in "World Biodiversity Congress 2014" held at Colombo, Sri Lanka from 24-27<sup>th</sup> November 2014

**Dr. Ranjita Panda**

1. Prakruti Bandhu Award on World Environment Day (5<sup>th</sup> June 2010) by Ministry of Environment and Forest, Govt. of Odisha.
2. Environmentalist of the Year Award (2012) by National Environmental Science Academy (NESA) New Delhi
3. Prof.P.C.Mishra Young Scientist Award (2013) by Sambalpur University, in National seminar on conservation of Environment, Energy and Development, Organised by PG Deptt of Env. Sciences during 26-28<sup>th</sup> January 2013.
4. Scientist of the Year Award (2013) by National Environmental Science Academy (NESA) New Delhi presented at the International Conference on "Environment and Human Health" on 9-10 December, 2013 held at Jamia Hamdard University, New Delhi.

### 30. Seminars/ Conferences/Workshops organized and the source of funding (national /international) with details of outstanding participants, if any:

1. National Seminar on “Sustainability of Earth resources- Strategies and Management Plans” organized jointly by Dept. of Earth Science and Dept. of Environmental Sciences during 13<sup>th</sup> - 14<sup>th</sup> February 2010  
Amount : Rs. 10,000/- Sources of Funding : UGC unassigned grant  
Outstanding Participant: Prof. K.C. sahu, Retd. Professor, Department of Earth Science, IIT, Mumbai
2. International Conference on “Energy, Environment and Development” (ICEED) organized by P.G. Department of Environmental Sciences, Sambalpur University from 10<sup>th</sup> -12<sup>th</sup> Dec 2010  
Amount : Rs. 2,00,000/- Sources of Funding : DST, MOES,CSIR New Delhi  
Outstanding Participant:
  - i. Dr. Debashis Raha, Environment Engineer, Wallongong Division, Sydney, Australia
  - ii. Dr. Ravi Gunaratne, Lincoln University, Cantenbury, New Zealand
  - iii. Prof. M.C. Dash, Ex-Vice Chancellor Sambalpur University
3. Workshop on “ Urban Solid waste Management including Plastic Waste” organized by P. G. Department of Environmental Sciences, Sambalpur University in collaboration with State Pollution Control Board on 30<sup>th</sup> September 2011  
Financial support from SPCB, Bhubaneswar  
Outstanding Participant: Dr. B.C. Sabat, Scientist-E, MoEF, New Delhi
4. Workshop on “ Forest for People” organized by P. G. Department of Environmental Sciences, Sambalpur University in collaboration with Dept of Environment & Forest, Govt of India on 2<sup>nd</sup> December 2011  
Financial Support from State Forest Department  
Outstanding Participant: D.P.Kampa, ACF, Sambalpur
5. National Seminar on Ecology, Environment and Development (NASEED) organized by P.G.Department of Environmental Sciences, Sambalpur University from 25<sup>th</sup> -27<sup>th</sup> January 2013  
Amount : Rs. 3,50,000/- Sources of Funding : ICSSR, DST, MOES,CSIR New Delhi  
Outstanding Participant:
  - i. Prof. P.C. Mishra, Expert Member, National Green Tribunal, New Delhi
  - ii. Prof. B.C. Tripathy, Vice-Chancellor, Ravenshaw University
  - iii. Prof. M.C. Dash, Ex. Vice-Chancellor, Sambalpur University, Ex-Chairman SPCB
6. Training Programme on Environmental Awareness Under the State Youth Policy 2013 organized by P.G.Department of Environmental Sciences, Sambalpur University in collaboration with State Pollution Control Board, from 21<sup>st</sup> -22<sup>nd</sup> December 2013  
Financial support from SPCB, Bhubaneswar  
Outstanding Participant:
  - Students, Teachers, Lecturers from Different Schools and Colleges of Western part of Odisha
7. National Workshop on Mathematical Modeling of Water Pollution organized jointly by Dept. of Mathematics and Dept. of Environmental Sciences during 14<sup>th</sup> -16<sup>th</sup> February 2015  
Financial support from: UGC unassigned grant, Sambalpur University and funding from aquascence project funded to Mathematics Department by DST, New Delhi  
Outstanding Participant:
  - i. Prof. S.K. Udgata, Central University Hyderabad
  - ii. Prof S.Ray, Calcutta University

### 31. Code of ethics for research followed by the departments

1. All research papers are submitted for publication with adequate correction after running through the Plagiarism software
2. Some samples are retested to know the reproducibility of results
3. Due precautions are taken in the field and Laboratory for contamination of samples



**32. Student profile programme-wise:**

Year	Name of the Programme (refer to question no. 4)	Applications received	Selected (Appeared)		Pass percentage (From appeared)	
			Male	Female	Male	Female
2010-11	M.Sc. Environmental Sc.	101	6(6)	12(8)	100%	100%
	M.Phil. Environmental Sc.	16	2(1)	7(7)	100%	100%
	M.Tech. Evt. Sci. & Engineering (Self Financing)	40	7(5)	12(12)	100%	100%
2011-12	M.Sc. Environmental Sc.	65	5(5)	13(13)	100%	100%
	M.Phil. Environmental Sc.	10	2(2)	6(5)	100%	100%
	M.Tech. Evt. Sci. & Engineering (Self Financing)	35	12(9)	6(6)	100%	100%
2012-13	M.Sc. Environmental Sc.	88	6(6)	13(9)	100%	100%
	M.Phil. Environmental Sc.	12	1(1)	5(5)	100%	100%
	M.Tech. Evt. Sci. & Engineering (Self Financing)	41	16(13)	2(2)	100%	100%
2013-14	M.Sc. Environmental Sc.	89	8(8)	13(9)	100%	100%
	M.Phil. Environmental Sc.	20	1(1)	7(6)	100%	100%
	M.Tech. Evt. Sci. & Engineering (Self Financing)	25	16(13)	2(2)	100%	100%
2014-15	M.Sc. Environmental Sc.	65	04	14	Continuing	Continuing
	M.Phil. Environmental Sc.	10	2(2)	3(3)	100%	100%
	M.Tech. Evt. Sci. & Engineering (Self Financing)	49	11	7	Continuing	Continuing

**33. Diversity of Students:**

Year	Name of the Course (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from univ. outside the State	% of students from other countries
2010-11	M.Sc. Env. Sc.	72	22	6	Nil
	M.Phil. Env. Sc.	56	33	11	Nil
	M.Tech. Env. Sci and Engg	63	37	Nil	Nil
	Ph.D Env. Sci. And Engg	80	20	Nil	Nil
2011-12	M.Sc. Env. Sc.	83	17	Nil	Nil
	M.Phil. Env. Sc.	25	75	Nil	Nil
	M.Tech. Env. Sci and Engg	39	17	44	Nil
	Ph.D Env. Sci. And Engg	100	Nil	Nil	Nil

<b>2012-13</b>	M.Sc. Env. Sc.	<b>84</b>	<b>16</b>	<b>Nil</b>	<b>Nil</b>
	M.Phil. Env. Sc.	<b>33</b>	<b>50</b>	<b>17</b>	<b>Nil</b>
	M.Tech. Env. Sci and Engg	<b>33</b>	<b>50</b>	<b>17</b>	<b>Nil</b>
	Ph.D Env. Sci. And Engg	<b>40</b>	<b>60</b>	<b>Nil</b>	<b>Nil</b>
<b>2013-14</b>	M.Sc. Env. Sc.	<b>73</b>	<b>27</b>	<b>Nil</b>	<b>Nil</b>
	M.Phil. Env. Sc.	<b>88</b>	<b>12</b>	<b>Nil</b>	<b>Nil</b>
	M.Tech. Env. Sci and Engg	<b>23</b>	<b>65</b>	<b>12</b>	<b>Nil</b>
	Ph.D Env. Sci. And Engg	<b>67</b>	<b>33</b>	<b>Nil</b>	<b>Nil</b>
<b>2014-15</b>	M.Sc. Env. Sc.	<b>55</b>	<b>40</b>	<b>5</b>	<b>Nil</b>
	M.Phil. Env. Sc.	<b>80</b>	<b>20</b>	<b>Nil</b>	<b>Nil</b>
	M.Tech. Env. Sci and Engg	<b>63</b>	<b>21</b>	<b>16</b>	<b>Nil</b>
	Ph.D Env. Sci. And Engg	<b>67</b>	<b>33</b>	<b>Nil</b>	<b>Nil</b>

34. How many students have cleared Civil Services and Defense Services examinations, NET, SET, GATE and other competitive examinations? Give details category-wise.

Fellowship	Year				
	2010-11	2011-12	2012-13	2013-14	2014-15
UGC JRF- NET Fellowship Cum Eligibility for Lecturership	-	<b>1</b>	-	-	-
UGC JRF- NET Eligibility for Lecturership	-	-	<b>4</b>	<b>1</b>	-
DST INSPIRE	-	<b>1</b>	-	<b>1</b>	-
UGC RGNF	<b>2</b>	-	-	<b>1</b>	<b>2</b>
NET (ICAR)	-	-	-	<b>1</b>	

35. Student progression

Progression From-to	Percentage of the passed out students				
	2010-11	2011-12	2012-13	2013-14	2014-15
<b>P.G. to M.Phil</b>	<b>36%</b>	<b>13%</b>	<b>7%</b>	<b>39%</b>	<b>29%</b>
<b>P.G. to M.Tech.</b>	<b>57%</b>	<b>31%</b>	<b>21%</b>	<b>17%</b>	<b>14%</b>
<b>P.G.to Ph.D.</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>
<b>M.Phil to Ph.D.</b>	<b>13%</b>	<b>33%</b>	<b>13%</b>	<b>17%</b>	<b>25%</b>
<b>M.Tech. to Ph.D.</b>	<b>8%</b>	<b>6%</b>	<b>Nil</b>	<b>7%</b>	<b>7%</b>
<b>Ph.D. to Post Doctoral</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>
<b>Employed</b>					
Campus Selection	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>
Other than Campus Recruitment	<b>20%</b>	<b>21%</b>	<b>18%</b>	<b>22%</b>	<b>16%</b>
<b>Entrepreneurs</b>	<b>Nil</b>	<b>1 (no)</b>	<b>Nil</b>	<b>1(no)</b>	<b>Nil</b>

**36. Diversity of staff****Percentage of faculty who are graduates of**

The same University	1nos. (20%)
From other University within the state	3 nos. (60%; 2 nos. Ph.D. from other institutes, 1 no. M.Sc. from other institute)
From other Universities from other states	1 no (20%; Ph.D. from other institute)
From University outside the country	Nil

**37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period**

1. Dr. M.R. Mahananda- Awarded M.Tech. in the year 2013
2. Dr.R.Panda- Awarded Ph.D. in the year 2011
3. A.K. Bhadra- Awarded M.Phil. in the year 2010

**38. Present details of departmental infrastructural facilities with regard to**

- a) **Library** : 1 no.
- b) **Internet facilities for staff and students** : All teaching staffs have their terminals connected with e-governance; one terminal for students connected with e-governance; Centralised internet facility provided through e-governance.
- c) **Total number of class rooms** : 2 nos.
- d) **Class rooms with ICT facility** : 1 no.
- e) **Students' laboratories** : 2 nos
- f) **Research laboratories** : Instrument Rooms 2 nos.

**39. List of doctoral, post-doctoral students and Research Associates****i) Doctoral Student****a) from the host institution/university****Under Dr. P.C. Mishra*****Awarded***

1. Kumarmani Meher. Socio-ecological studies of some tribal villages of western Odisha 2012
2. Suraj Tandon. Reclamation of Ash mounds through plantation: vegetation enumeration and changes in soil quality 2013

***In Progress***

1. Beena Thakkar: Impact of Industrial emission on morphological, anatomical and Biochemical characteristics of tree vegetation around Vedanta Aluminium Ltd., Jharsuguda
2. Dullav Bhosagar: Soil metabolism and growth performance of plant *Vigna radiata* (Roxb.) in Chicken dung amended soil.

**Under Dr. S.K. Sahu*****Awarded***

1. Hema Kumar Nayak. Ecology of soil nematodes in a natural and afforested teak forest of Sambalpur, Orissa: A comparative study. 2010
2. Kumar Ranjan Pani. Environmental Impact Studies on Surface and Ground Water Quality in and around Hirakud, Orissa, 2011
3. Anindita Bhattacharya. Effects of some agrochemicals on earthworm and biochemical activities in soil, 2012

***In Progress***

1. Mamata Rath: Identification, Characterisation, Evaluation, Utilisation and disposal of Solid and Hazardous wastes in an integrated iron and steel plant of Odisha, India

**Under Dr. S.K. Pattanayak*****In Progress***

1. Lopamudra Patnaik. Effects of Urbanisation on Water bodies in and around Dhenkanal Town, Odisha Since 2013
2. Abanikanta Bhadra . Biogeochemical basis of plant diversity on Gandhamardan hill of eastern ghat in Orissa, India. Since 2011
3. Rabindranath Barik. Soil and water quality along the Urban-Rurban-Rural continuum in Rourkela and its surrounding area Since 2011
4. Puspita Mohapatra. Geochemical Change along the stratigraphic gradient and its control on the occurrence of Microorganisms in Different Rock Formations in Ib-valley Coal Field, Orissa Since 2011
5. Karuna Ekka. Evaluation of the Impacts of Urbanisation on the Mahanadi river water quality near Sambalpur town, Odisha and development of appropriate mitigation measures Since 2014

**Under Dr. M.R. Mahananda*****Continuing***

1. Swayamsidha Mishra: The effects of Lead on nutrition and child health in and around industrial belts of Jharsuguda district of western Odisha, India

**b) from other institutions/universities****Under Dr. P.C. Mishra*****Awarded***

1. Er. Sambhu Jha. Dust Dispersion modeling in open cast coal mines and control of dispersion in Mahanadi coalfields of Orissa 2011 (ISM, Dhanbad)

**Under Dr. S.K. Sahu*****Awarded***

1. Akhyaya Kumar Panda. Environmental education for high schools, 2010 (Utkal University)
2. Shekhar Upadhyay. Environmental impact of converted ecosystems within Similipal biosphere reserves in Orissa, 2011
3. Arun Kumar K. Impact of Changing Land Uses on Soil Microbial Diversity and Biological and Biochemical Indicators of Soil Health in the Central Himalayan Region of India 2013 (ICAR, New Delhi)

***In Progress***

2. Mamata Rath: Identification, Characterisation, Evaluation, Utilisation and disposal of Solid and Hazardous wastes in an integrated iron and steel plant of Odisha, India

**Under Dr. S.K. Pattanayak*****In Progress***

1. Annapurna Behera. Natural and Anthropogenic Geochemical signatures in water and soils around Danmanjodi town: A medical geology perspective (19.02.2011- 18.02.2018) (Institute of Chemicals, Calcutta)

## ii) Post-Doctoral Student

a. from the host institution/university : Nil

b. from other institutions/universities :

Under Dr. P.C. Mishra*Completed*

1. Dr.D.Raha Climate Change Management Systems for an integrated water and waster water utility. D.Sc. Awarded in 2014

## 40. Number of post graduate students getting financial assistance from the university.

**P.G. Indira Gandhi Scholarship for University Rank Holder (UGC Sponsored)**

Programme	2010-11	1011-12	2012-13	2013-14	2014-15
M.Sc. Environmental Science	-	-	-	-	Gen-1 no.

**P.G. Indira Gandhi Scholarship for Single Girl Child (UGC Sponsored)**

Programme	2010-11	1011-12	2012-13	2013-14	2014-15
M.Sc. Environmental Science	-	-	-	-	Gen-1 no.

**P.G. Post Matric Scholarship for SC, ST, OBC**

Programme	2010-11	1011-12	2012-13	2013-14	2014-15
M.Sc. Environmental Science	SC- 3 nos. ST- 2 nos.	OBC- 1 no	SC- 1 no OBC-4 nos	ST- 1 no SC- 1 no OBC-3 nos	ST-3 nos SC- 1 no OBC-2 nos
M.Phil.Environmental Science	-	-	ST- 2 nos.	-	OBC-1 no.
M.Tech.Environmental Science and Engineering	SC- 1 no.	-	-	-	-

**Medhabruti**

Programme	2010-11	1011-12	2012-13	2013-14	2014-15
M.Sc. Environmental Science	-	-	-	-	Gen-1 no.

## 41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology.

Before the M.Tech. in Environmental Science and Engineering programme was introduced its need was discussed with different alumni members who had completed the course from different leading institutes and with those working in different industries.

- 42. Does the department obtain feedback from**
- a. Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?**  
In every academic year in the last teacher's Council this aspect is discussed and suggested modifications (if any) are incorporated in the curricula.
- c. Students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?**  
Student feedback is obtained in every academic year and the following actions are taken; i) modification in the curriculum (if any), ii) suggestion to teacher for improvement in teaching, iii) suggestion to other staffs for providing laboratory facilities in time.
- d. Alumni and employers on the programmes offered and how does the department utilize the feedback?**  
In the alumni meet different alumni members are asked about the requirement of the organisations (Industries, National institutes, Consultancy wings etc.) and accordingly possible modifications are made in the programmes in consultation with the syllabi of the other institutes.

**43. List the distinguished alumni of the department (maximum 10)**

Sl. No.	Name	Designation	Institute
1.	Ashis Mohapatra	Scientist	Environment and Toxicology, Institute, Canada
2.	Prof.P.C. Mishra	Expert member, NGT, Kolkata, India	NGT, Kolkata, India
3.	Dr. Debashis Raha	Environment Engineer	Wallongong Division, Sydney, Australia
4.	Dr. Ranjita Panda	Regional Director	Research Wing, IGNOU, New Delhi
4.	Dr. P.K. Behera	Scientist E	CPCB, New Delhi
5.	Dr. Sharada Srinivas Pati	Environmental Scientist	SPCB, Bhubaneswar
6.	Gagan Pattanaik	Environmental Manager	Leighton Group, LEED, AP
7.	Jitendra Kumar Sahu	Environmental Manager	OMC, Orissa
8.	Ashish Kumar Das	Environment Officer	NHPC, New Delhi
9.	Dr. Anjan Kumar Prusty	Senior Scientist and UNESCO Member	GUIDE Gujarat
10.	Susmita Ekka	Scientist	RPCB, Kolcatta

44. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts.

**Resource Persons Invited for Lectures in the Department**

Name	Address	Topic
Prof. M. Saratchandra Babu,	GITAM University, Visakhapatnam	Storage of Hydrogen in inorganic framework for clean energy and application
Prof. Sudhakar Marathe	Department of English, Central University, Hyderabad	Environment and Earth
Prof. Meera Marathe	IIT, Hyderabad	Language and Earth
Prof. D.P. Kuity	, Pt. Ravishankar Shukla University, Raipur	Environmental Studies: Fashion and need of the time
Prof. S.C. Santra	Kalyani University, West Bengal	Many facets of soil pollution and Management measures for Sustainability of soil system
Prof. S.S. Mishra	OUAT, Bhubaneswar	Agriculture weed in western Odisha
Dr. Udyan Naik	V.S.S., Medical College Burla	Biomedical Waste Management
Prof. Madhab Chandra Dash	Ex Vice-Chancellor, S.U, Ex-Chairman, SPCB, Bhubaneswar	Environment. Development and Energy Security in Rural India
Dr. Ravi Goonaratne	Lincoln University, Cantenbury, New Zealand	Role of Biomarkers in Environmental Pollution Monitoring
Prof. P.V.V. Prasad Rao	College of Science and Technology, Andhra University, Visakhapatnam	Environmental Pollution
Prof. T.C. Banerjee	Department of Zoology, Burdwan University, Burdwan	Ecotoxicology of Fish
Prof. S. Ramakrishna Rao	College of Science and Technology, Andhra University, Visakhapatnam	Advanced Technology to Combat Global Warming
Prof. William Mohanty	IIT, Kharagpur	Basics of Earthquake and seismic microzonation
Prof K. Veerabhadram	GITAM University, Visakhapatnam	Technology in Environment Management
Prof. T. Bhattacharya	Department of Zoology, Vidyasagra University, Midnapur	Soil microfauna in different agroecosystem
Dr. Debashis Raha	Wallongong Division, Sydney, Australia	Climate Change
Prof. R.D. Singh,	IARI, New Delhi	Soil Quality of Himalayan Ecosystem
Prof. J.Singh	BHU, Baranashi	Biodiversity of Soil Macrofauna

**45. List the teaching methods adopted by the faculty for different programmes.**

- Interactive mode of teaching
- Black board mode of teaching
- Power point
- VLC Media player
- Field based Exercises
- Computer based Exercises
- Internal Assessment and Home assessment are part of the teaching programme

**46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?**

- i) Through Internal Assessment and Home Assignment
- ii) Through Review of progress in regular intervals  
The IQAC is certainly an useful tool for this

**47. Highlight the participation of students and faculty in extension activities.**

- i) Some students are working in NGOs dealing with Environmental Issues
- ii) Faculties have taken part as resource persons to develop awareness to college and school students concerning issues on Environment degradation and their management
- iii) Faculties have acted as resource persons to train the Executives of NTPC and MCL on environmental management

**48. Give details of “beyond syllabus scholarly activities” of the department.**

The department has adopted the following beyond syllabus Scholarly activities

- The department invites speakers to deliver talks on frontiers of Environmental Science
- The students of each semester deliver seminar on different aspects of Environment eventhough the seminar is not included in all the semesters
- The department has carried out green audit of the Sambalpur University campus in terms of Environmental pollution : pollution of soil, water and air
- Tree population structure and plant diversity of the Dehri Reserve forest in the Campus
- The students participates in Debates and Cultural activities in the campus

**49. State whether the programme/ department is accredited/ graded by other agencies? If yes, give details.**

The M.Sc., M.Phil/Ph.D. and M.Tech programmes running in the department are accredited to UGC

**50. Briefly highlight the contributions of the department in generating new knowledge, basic or applied.**

The Department has contributed new knowledge in the field of

- i) Vermitechnology
- ii) Addressing the Water, Air, Soil pollution issues of Western Odisha through scientific contributions
- iii) Addressing the Biodiversity issues of Western Odisha through Scientific Contributions



**51. Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.**

**Strengths**

- Interdisciplinary Subject with highly qualified and experienced faculties from different disciplines
- Oldest Department of the State (Alumni are appointed in different areas in the countries and overseas)
- Only Department Working in the Industry-Institute Interface
- Faculty members are also undertaking teaching and research and other activities in collaborative mode
- Industrial training is a part of the Curriculum
- The curricula at M.Sc., M.Phil. and M.Tech. levels have been developed
- based on the curricula of other premier institutes of the country and abroad as well as that of UGC-NET/Lecturership Examination
- The evaluation pattern involves multiple, short and long answer type
- questions and numerical questions wherever required

**Weaknesses**

- Less number of Regular Staffs (Required 6, Sanctioned 4, Present 3)
- Less space

**Opportunities**

- Students are getting Jobs in Private Industries (Vedanta, HINDALCO, ADITYA, BIRLA, JINDAL)
- Public Sectors (SAIL, MCL, NTPC, NHPC, NALCO, )
- Government Sectors (CPCB, SPCB, Urban Planning)
- Consultancy Projects are funded by different Industries and Government Agencies
- Students are going to premier institutes and Abroad for higher studies

**Challenges**

- Even though Supreme Court and UGC have given directions to Universities and state governments to appoint teachers /lecturers in the field of Environmental Science the subject has not been included in the list of many State Public Service Commissions including that of Odisha in regard to appointment of Lecturers and giving opportunity to students of Environmental Science in Civil Services.
- There is no government policy to expand the Department in terms of staff structure & enable the Department to apply for SAP

**52. Future plans of the department.**

1. Opening of a 5 years integrated Course in Environmental Science
2. Installation of Solar Power Unit
3. Publication of a Journal biannually
4. MOU with premier Institutes for Research

### Publications of Environmental Sciences (2010-15)

#### 2010

- Bhadra, A.K., Dhal, N.K., Rout, N.C. and Raja Reddy., V (2010). Phytosociology of the tree community of Gandhamardan Hill ranges. *Indian Forester* FRI Dehradun Vol.136(5): 610-620.
- Bhadra, A.K., Sahu, S.C., Dhal, N.K. (2010). Indigenous herbal treatment for Chronic Suppurative Otitis Media (CSOM) among kondh tribe of Bolangir district, Orissa, India – A case study. *Biohelica* Botany Department, GM College. Vol.1(1) : 38-40
- Bhadra, A.K. Dhal, N.K. (2010). Tree seedling diversity in the protected natural forest of Gandhamardan hill ranges *The Bioscan* National Environmentalist Association (NEA), Special Vol.2:451- 459
- Das, B. and Sahu, S. K. (2010). Generation, composition and disposal practice of solid waste in Burla N. A. C. of Orissa. *The Bioscan*, Special Volume 3:753-759
- Jha Sambhu and Mishra P.C. (2010). Dust dispersion modeling in opencast coal mines and control of dispersion in Mahanandi Coalfields of Orissa. *Bioscan* Special issue (Vol 2), Proceedings of the International conference ICEED 2010.479-500.
- Kar, P. K., Pani, K. R., Pattanayak, S. K. and Sahu, S. K. (2010). Seasonal variation in physicochemical and microbiological parameters of Mahanadi river water in and around Hirakud, Orissa (India). *The Ecoscan*, 4(4):7
- Kar, P. K., Pani, K. R., Pattanayak, S. K. and Sahu, S. K. (2010). Applicability of regression analysis in estimation of water quality parameters of Mahanadi river in and around Hirakud, Orissa (India). *The Ecoscan*, 4(4):23-28.
- Mahananda, M.R., Behera, N.R. and Mohanty, B.P. (2010). Protective efficacy of L- ascorbic acid against the Toxicity of mercury in *Labeo rohita* (Hamilton). *The Bioscan: Special Issue*, Vol.3; 681-690.
- Mahananda MR, Mohanty BP and Behera NR (2010). Physico-chemical analysis of surface and ground water of Bargarh district, Orissa, India. *International Journal of Research and Review in Applied Sciences*. 2(3): 272
- Mishra P.C., Behera, N., Mishra, S.P. and Meher Kumarmani (2010). Ecological enumeration of tree vegetation and their contribution in removal of atmospheric pollution load: a case study in an industrial complex of western Orissa, India. *Asian Journal of Water, Environment and Pollution*. vol 8, No.3, 19-28
- Padhan, A. and Sahu, S. K. (2010). Effect of rice mill waste water on growth, reproduction and metabolism of *Drawida willsi* (Oligochaeta) under laboratory conditions. *International Journal of Research & Reviews in Applied Sciences*, 5(1):76-85
- Raha D and Mishra, P.C. (2010). Comparative carbon footprint study for alternative wastewater treatment technology. *Bioscan* Special issue Vol 1), Proceedings of the International conference ICEED 2010.13-23.
- Raha Debashis and Mishra, P.C. (2010). Carbon cost of safe water supply through advanced treatment of river water to a country town. *Bioscan* Special issue Vol 2), Proceedings of the International conference ICEED 2010.283-293.

Sahu, S.C., Dhal, N.K. and Bhadra, A.K. (2010). Arboreal Taxa Diversity of Tropical Forests of Gandhamardan Hill Range, Eastern Ghats, India: An Approach to Sustainable Biodiversity Conservation *Bio. & Cons. (Taiwania)* The College of Life Science, National Taiwan University Vol.55(3): 208-215

## 2011

Behera, P.K., Sahu, S.K. and Shivarama, M.S. (2011). Encyclopedia of Hazardous Waste Management— Six Volumes :Vol. I-VI( ISBN81-7888-608-1)Authors:Publisher: Dominant Publishers and Distributors, New Delhi-110002, Year of Publication : 1<sup>st</sup> Edition).

Raha D and Mishra, P.C. (2011)..Life Cycle Carbon footprint for desalinated water service ,The Ecoscan ,Special Issue Vol 1 , 7-12

Mahananda M.R., Deo, P.S., Mohanty B.P., and Behera N.R. (2011). Effects of Organochlorine pesticide (Endosulphan) on Germination, Growth and some Biochemical Parameters in Rice Crops. *Research Journal of Chemistry and Environment*.15(2): 291-296. (Imp. Factor: 0.296).

Mishra, P.C. (2011). .Heavy metal accumulation in crops grown in fly ash amended soil . The Ecoscan ,Special Issue Vol 1, 13-22

Muduli R., Swamy, Y.V. and Panda, S.P. (2011). Emission of methane and nitrous oxide from pulse cultivation in rain fed uplands of Odisha. Proceeding of Climate Change-Impact of Environment and Human Health. Held on 11<sup>th</sup> and 12<sup>th</sup> February 2011 at Gayatri Vidya Parishad Degree College (Autonomous) Vishakhapatnum

Padhan, A. and Sahu, S. K. (2011). Effect of rice mill waste water on population, biomass, rate of reproduction and secondary production of *Drawida willsi*(Oligochaeta)in rice field agroecosystem. *International Journal of Research & Reviews in Applied Sciences*, 6(2):149-157.

Padhan A. and Sahu, S. K. (2011). Effect on pigment content, biomass, growth and yield of rice plant (*Oryza sativa* L.)by applying rice mill waste water under field conditions.*J.T.R.Chem*.18(1)37-50.

Panda Ranjita, Kar, R.N. and Panda, C.R. (2011).Bioleaching of phosphorous from rock phosphate by fungi isolated from agriculture soil. *The Bioscan*, Vol. 3; pp.799-807

Panda Ranjita, Kar, Rabi N., Panda, Chitta R. and Panda, Siba P. (2011) Rock phosphate dissolution by phosphate solubilising fungi isolated from marine sediment. *Int. J. Env. Sci.* Vol. 2 (3rd Issue), pp. 387-394

Panda Ranjita and Panda Siba Prasada (2011). Impact of Pesticides and other Agricultural Wastes on Environment. Proceeding, National seminar on Management of Industrial Pollution, Organised by Department of Chemistry Purussottam Institute of Engineering and Technology, Rourkela, held on 23<sup>rd</sup> -24<sup>th</sup> September, 2011, pp 70-76

Panda Ranjita, Kar Rabi N., Panda Chitta R. and Panda Siba P. (2011).. Solubilisation of Low Grade Rock Phosphate By *Aspergillus niger*. Proceeding, International Conference on Technological Challenges and Management Issues for Sustainability of Mining Industries, Organised by Department of Mining Engineering, National Institute of Technology, NIT Rourkela, from 4-6<sup>th</sup> August, 2011, pp 193-199

Panda Ranjita, Kar Rabi N., Panda, Chitta R. (2011). Microbial leaching of Phosphorous from LD Slag by Heterotrophic Bacteria. Proceeding, International Conference on

Technological Challenges and Management Issues for Sustainability of Mining Industries, Organised by Department of Mining Engineering, National Institute of Technology, NIT Rourkela from 4-6<sup>th</sup> August, 2011, pp 125-129

Panda Ranjita (2011). Environmental Effects due to Ozone Layer Depletion. National Seminar on Global Warming and Climate Change, Organised by TYAGA at MCL, Burla held on 5-6 August, 2011.

Tandon ,S, Sahu,S.K. and Mishra ,P.C. (2012).. Litter disappearance in ash mound plantation site. The Ecoscan : Proceedings of the International Conference on Anthropogenic Impact on Environment & Conservation Strategy. Special issue, Vol. 1:1-4

## 2012

Behera ,S. Mallick ,B. Tiwari , T.N. and Mishra, P.C. (2012). X-Ray Characterisation of Various Aluminium Phases in the Medicinal Herb *Bacopa Monnieri* Affected by Simulated Acid Rain. Journal of Biomedical and Pharmaceutical Research 1 (1) 2012, 08-15

Behera, D. and Pattanayak, S.K. (2012). Assessment of decadal change in Landuse/Landcover using geospatial technology for the region of proposed Alumina refinery and bauxite mines in Karlapat, Kalahandi district, Odisha, Vistas in Geological Research, Utkal University Special Publicatio in Geology, ISSN: No. , v.11, pp. 149-157.

Bhattacharya, Anindita, Sahu, Sanjat Kumar and Sarkar, Prabal (2012). Ecotoxicity of Pesticides: A Comparative study between imidacloprid and dimethoate (ISBN;978-3-659-43898-1) Publisher: LAP Lambert Academic Publishing, Saarbrucken, Germany, 2012 Edition

Bhoi Lakshmikanti and Mishra, P.C.(2012). Changes in bacterial density, CO<sub>2</sub> evolution and enzyme activities in poultry dung amended soil. Open Journal of Soil Science 2 ([http://www. Sci RP. org/ Journal/OJSS](http://www.SciRP.org/Journal/OJSS))

Bhoi Lakshmikanti, Bhosagar Dullav and Mishra, P.C. (2012). Growth-metabolism of mustard and earthworms and arsenic mobility in poultry dung amended soil Agricultural Science Research Journals Vol. 2(8), pp. 441-448, August 2012

Bhoi Lakshmikanti, Bhosagar Dullav and Mishra, P.C. (2012). Growth-metabolism of Mustard and Earthworms and Arsenic mobility in poultry dung amended soil. Agricultural Science Research Journal .Vol 2 (8) ,441-448

Dullav Bhosagar, ,Lakshmikanti Bhoi and Mishra, P.C. (2012). Germination potential and seedling performance of Green Gram in Arsenic contaminated hydroponic culture. Agricultural Science Research Journal. Vol 2(8)441-448

Mahananda, Malaya Ranjan and Mohanty, Bidut Prava (2012) Toxicity on Biochemical and Hematological Parameters in *Bufo melanostictus* (Schneider) (Common Indian Toad) Exposed to Malathion. (Ed.) R. P. Soundarajan. *Pesticides-Advances in Chemical and Botanical Pesticides*. ISBN-978-953-51-0680-7. InTech Open Access/Open Mind Publication. Croatia.

Mahananda, Malaya Ranjan and Mohanty, Bidut Prava (2012). Dependency of patikar on Bamboo at Mundher Village of Sambalpur District Orissa. (Ed.) B.M. Sharma. *Current topics in Environmental Sciences*. Oxford Publication, New Delhi. ISBN-978-93-5030-104-3

- Mishra P.C., Dash A.K. and Pradhan Khageswar (2012). Metals in Environmental segments at Hirakud of Odisha, India. *ISCA Journal of Biological Sciences* Vol. 1(1), May 7-23
- Mohanty Bidut Prava, Mahananda Malaya Ranjan, Tripathy Niraj Kanti (2012). Antimutagenic Effects of Ascorbic Acid against the Genotoxicity of Dimethyl Sulphate in *Drosophila*. *Universal Journal of Environmental Research and Technology*. Volume 2, Issue 1: 77-84.
- Mohanty Sarbani and Pattanayak, S.K. (2012). Soci-economic development and challenges for women managers: Indian Scenario, *International Journal of Research in Economics and Social Sciences*, ISSN: 2249-7382, v.2, issue 10, pp. 19-28.
- Padhan, A. and Sahu, S. K. (2012). Effect of rice mill waste water on soil respiration and enzyme activities under field and pot condition. *Asian journal of water, Environment and Pollution* (IOS Press, The Netherlands), 9(2):61-71
- Padhi S. K. , Sahu, S. K., Kumari, A. , Bharati, S and Ansari S. (2012). Phytoremediation as an alternative for treatment of paper mill industry effluents by using water hyacinth (*Eichhornia crassipes*). *International Journal of Research in Chemistry and Environment*, 2(3):1-5.
- Panda Ranjita and Panda, S.P. (2012). Seasonal Variations of Phytoplankton Population in Mahanadi Estuary East Coast of India. *International Journal of Environmental Sc and Technology*, Vol.1, pp 44-44
- Panda, Ranjita, Panda, Siba.P., Kar, Rabi.N. and Panda, Chitta.R. (2012). Influence of environmental factors and salinity on phosphate solubilization by *Aspergillus niger*, PSF4 from marine sediment. *E-Planet*, 9(2) pp 1-7.
- Panda, S.P. and Panda, Ranjita (2012). Evaluation of SO<sub>2</sub> levels at four different air quality monitoring stations around Banarpal, Near the Industrial Township of Angul, Odisha, India *International Journal of Environmental Sc and Technology*, Vol.1, pp 1-5
- Panda, Siba P., Nayak, J.P. and Mukherjee, P., Rath, Jay, Swar, A.K. and Panda, Ranjita (2012). Real Time Data Transmission Of Aaq And Stack Through Y- Cable Mode Over Gprs Link –A feasible option of Hindalco Industries Limited, Hirakud, India. *International Conference on Chemical, Bio-Chemical and Environmental Sciences (ICBEE'2012)*, Singapore.
- Tandon, S, Sahu, S. K., Mishra, A. S. P. and Mishra, P. C. (2012) Litter disappearance in ash mound plantation site. *The Ecoscan*, Special Volume1:83-86.
- Tandon, Suraj, Sahu, S.K. and Mishra, P.C. (2012). Litter disappearance in Ash mound plantation sites. *Proceedings of the International Conference ICAIECS 2012 held at Ranchi University during 2-4 November 2012*. Vol.1 ,1-4.
- Upadhyay, S., Sahu, S. K., Panda, G. K. and Upadhyay, V. P. (2012) Human ecology of a village in Similipal Biosphere Reserve, Odisha, India. *Plant Science Research*, 34(1&2):54-59.
- Upadhyay, S., Sahu, S. K., Panda, G. K. and Upadhyay, V. P. (2012) Linkages between agriculture and forest: Case study from three tribal villages located in a biosphere reserve of India. *Geo-Eco-Trop.* (Belgium), 36:39-48.

## 2013

- Arun Kumar, K., Singh, R.D., Patra, A.K. and Sahu, S.K. (2013). Probing of microbial community structure, dehydrogenase and soil carbon in relation to different land uses in

- soils of Ranichauri(Garhwal Himalayas).International Journal of current Microbiology and Applied Sciences, 2(11):325-338.
- Bhadra, A.K.& Mahananda, M.R. (2013). Bioaccumulation of hexavalent Chromium in rice(*Oryza sativa*L.) grown in paddy field soil of Basundhara coal mine area, Sundargarh, Odisha, India*The Ecoscan*National Environmentalist Association (NEA)Special Issue: Volume III21-28
- Bhadra, A.K. and Mahananda, M.R. (2013). Bioaccumulation of hexavalent chromium in rice (*Oryza sativa* l.) Grown in paddy field soil of Basundhara coal mine area, Sundargarh, Odisha, India. *The Ecoscan*. Special Issue Vol.III. 21-28
- Bhattacharya, A. and Sahu, S. K. (2013). Acute toxicity of dimethioate on soil health: A study of its impact on earthworm. *International Journal of Biosciences*, 3(7):98-106
- Bhattacharya, A., Sahu, S. K., Hundet, A. and Sarkar, P. (2013). Effect of urea, superphosphate, potash and NPK on soil respiration(carbon dioxide evolution from soil).*Indian Streams Research Journal*, 3(10):1-5.
- Bhattacharya, A and Sahu, S. K. (2013). A comparison of effect of dimethioate and imidacloprid on soil respiration (carbon dioxide evolution from soil).*Journal of Biodiversity and Environmental Sciences*,3(6):56-63.
- Bhattacharya, A. and Sahu, S. K.(2013) – Environmental impact of imidacloprid on soil fertility: a case study on *Drawida willsi* earthworm. *The Clarion*, 2(1):21-29.
- Jha, Sambhu and Mishra, P.C. (2013). Identification of strategies for control of dust pollution due to coal transportation activities of open cast coal mines at Talcher Coalfields ,Odisha. *Ecoscan* Vol.III (Special Prof.P.C.Mishra Felicitation Volume of the Proceedings of the National Seminar on Ecology ,Environment and Development held at Sambalpur University during 25-27 January 2013), 273-280.
- Mahananda Malaya Ranjan, Mohanty Bidut Prava and Pradhan Suchismita (2013). Antioxidant activities in Fish, *Labeo rohita* (Hamilton) exposed to the heavy metal toxicant Cadmium chloride. *Journal of Ecology, Environment & Biology*. Vol. 1(1).pp-1-7.
- Mishra, S.S., Mishra, K.N. and Mahananda, M.R. (2013). Chlorophyll content studies from inception of leaf buds to Leaf-fall stages of Teak (*Tectona grandis*) of Kapilash Forest Division, Dhenkanal, Odisha. *Journal of Global Biosciences*. Vol. 2(1):pp.26-30.
- Mishra, P.C.(2013). Potential of Fly Ash utilization in Agriculture. Proceedings of the National Seminar Utilisation of Fly Ash in Geotechnical Structures”held on 8 & 9 November 2013 organised by *Indian Geotechnical Society* Bhubaneswar Chapter, Odisha 33-41.
- Mohanty, Bidut Prava and Mahananda, Malaya Ranjan and Pradhan, Suchismita (2013). Cadmium Induced Toxicity and Antioxidant Activities in *Labeo rohita* (Hamilton). *Environment and Ecology Research* 1(2):41-47.
- Nayak, S. and Sahu, S. K. (2013). Vermicomposting of poultry litter using *Eudrilus eugeniae*. *The Ecoscan*, Special Volume 3:267-271.
- Panda, Ranjita, Kar, Rabi N. and Panda, Chitta R. (2013). Dephosphorization Of Ld Slag By *Penicillium citrinum*. *The Ecoscan*, Special Volume 3. 247-250
- Panda, Ranjita and Panda, Siba Prasada (2013). Microbial Solubilisation of Rock Phosphate by phosphate solubilising Bacteria isolated from cultivated soil. *International Journal of Env. Sc. And Technology*, Vol 1(2) PP,145-150

- Panda, Ranjita and Panda, Siba Prasada and Mishra, C.S.K. (2013). The Effect of Hospital Solid Wastes on the Environment, *The Ecoscan*, Vol 6 (1&2) 37-40
- Panda, Ranjita and Panda, Siba Prasada (2013). Removal of Toxic metal ions from effluents using Neem leaves, *International Journal of Applied Environmental Science and Technology*, Vol 1 (1), 47-53
- Panda, Ranjita, Panda, Siba P., Kar, Rabi N. and Panda, Chitta R. (2013). Bioleaching of Uganda low grade rock phosphate by *Pseudomonas fluorescence*. *Research Journal of Recent Sciences*, Vol. 2(ISC-2012), 250-254 (2013)
- Panda, Siba P., Rath, Jay, Swar, A.K., Das Sidhanta and Panda, Ranjita (2013). Five YCable and a single GPRS Device Transmitted the Real Time Environmental Data from AAQMS. *International Journal of Environmental Science and Development*, Vol 5, No. 4, 398-402
- Panda, Siba Prasada and Panda, Ranjita (2013). Fluoride Load In Ground And Surface Water Of Selected Villages Of Nalco-Nagar, Anugul, Odisha *International Journal of Env. Sc. And Technology*, - Vol 1(2) PP, 133-138
- Pradhan, A., Sahu S. K. and Dash, A. K. (2013). Changes in pigment content (chlorophyll and carotenoid), enzyme activities(catalase and peroxidase), biomass and yield of rice plant(*Oryza sativa* L.)following irrigation of rice mill wastewater under pot culture conditions. *International Journal of Scientific & Engineering Research*,4(6):2706-2717.
- Raha, Debashis and Mishra, P.C. (2013). Green House Intensity of pollutants removal for wastewater plants applying different treatment technologies. *Ecoscan Vol.III (Special Prof.P.C.Mishra Felicitation Volume of the Proceedings of the National Seminar on Ecology ,Environment and Development held at Sambalpur University during 25-27 January 2013)*, 367-375.
- Sahoo, S., Pattanayak, S.K. Sethi, J.R., Haripal, K. and Panda, A.R. (2013). Heavy metal content and physic-chemical characteristics of soils in open forest and crop fields near Bhusan sponge iron plant in Sambalpur district of Odisha, India. *International Journal of Scientific Research*, ISSN No. 2277-8179, v.2 issue 8, pp.206-210.
- Tandon, Suraj, Ekka, N.L., Mishra, S.P., Behera, N. and Mishra, P.C. (2013). Ecological enumeration of vegetation in ash mound and their contribution to wasteland reclamation and carbon sequestration. *The Ecoscan Vol.III (Special Prof.P.C.Mishra Felicitation Volume of the Proceedings of the National Seminar on Ecology ,Environment and Development held at Sambalpur University during 25-27 January 2013)*, 75-81.

## 2014

- Bhadra, A. K. and Mahananda, M.R. (2014). Growth manifestations of rice (*Oryza sativa* L.) seedlings in the paddy field soil of Basundhara coal mine region of Sundergarh district for agro-ecosystem monitoring.(Ed.) M.S. Sheikh. *Biodiversity: Threats and conservation vol. II*. Pp.160-174. Global publishing House India.(Vishakhapatnam) ISBN- 978-93-81563-48-9.
- Bhadra, A.K.and Rautray, O.P.A (2014) floristic and sociocultural study on Mandargiri hills of Angul district of Odisha, India *Biodiversity Threats & Conservation Global Publishing House (INDIA), Vishakhapattanam-2 (AP) ISBN 978-93-81563-48-9Vol-II: 47-55*

- Bhadra, A.K., Dhal, N.K. and Pattanayak, S.K. (2014). Altitude based tree species occurrence in the protected natural forest of Gandhamardan hill ranges, Balangir, Odisha, *International Journal of Biology and Life Science*, ISSN(Online): 2320-4257, v.2, issue 2, pp. 420-441.
- Behera S., Mallick B., Tiwari, T.N. and Mishra, P.C. (2014). Investigation of self-neutralisation of Acid rain-induced acidifying Materials in Bacopa monnieri. *J. Environ. Res. Develop.* Vol 8 (4) April-June 867-875
- Malaya Ranjan Mahananda (2014). Intramuscular Single Dose one Compartmental Toxicokinetics of Lead in *Duttaphrynus Melanostictus*. *Indian Journal of Applied Research*. Volume : 4 | Issue : 10 | October 2014 | ISSN - 2249-555X (Impact Factor. 2.162).
- Mishra, P.C., Sahu, S.K., Bhoi, A.K. and Mohapatra, S.C. (2014). Fluoride uptake and Net Primary Productivity of Selected Crops. *Open Journal of Soil Science*, 4:388-398.
- Mishra, P.C., Sahu, S.K., Bhoi, A.K. and Mohapatra, S.C. (2014) Germination performance and growth potential of selected crops grown in fluoride contaminated soil. *Research Journal of Agriculture and Environmental Sciences*, 1(2) 15-27.
- Mishra, P. C., Mishra, A.S.P. and Tandon, Suraj (2014). Metals and Fluoride Dynamics in Fly Ash Mound under Plantation. In : (Dash A.P. and Das Mira ed.) *Advances in Environmental Sciences and Engineering*, Astral International Pvt. Ltd, New Delhi. Publ. 2014 p
- Panda, Ranjita, Panda, Siba P., Panda C.R. and Kar, R.N.. (2014) In vitro Solubilization of Inorganic Phosphate by Phosphate Solubilizing Microorganisms (PSM) from Rice Rhizosphere, *Advances in Environmental Sciences and Engineering*, Daya Publishing House, New Delhi, pp 326-334
- Rabindranath Barik and S.K. Pattanayak (2014). Geochemistry of groundwater in rural, rurban and urban areas in and around steel city Rourkela, Odisha, India. *Journal of Chemical Biological and Physical Sciences*, E-ISSN:2249-1929, v.4, no.2, pp. 1773-1779.
- Sahoo, S., Pattanayak, S.K and Chand, S. (2014). The effect of heavy metals on Enzyme activities in sponge iron industry polluted soil. *International Journal of Plant, Animal and Environmental Sciences*, ISSN No. 2231-4490, v.4, issue 4, pp.185-190.
- Sahu, Priyadarshini N, Mahananda, Malaya Ranjan and Seth, Prabhati (2014). Germination Rate of Tomato (*Lycopersicon Esculentum* Mill.) Seedling and the Enzyme Activity in Soil Amended with Rice Mill Effluent. *Journal of Agroecology and Natural Resource Management* Print ISSN: 2394-0786, Online ISSN: 2394-0794, Volume 1, Number 3; November-January, 2014 pp. 199-203
- Seth, Prabhati and Mahananda, Malaya Ranjan and Rani, A. (2014). Morphological and Biochemical Changes in Mung Plant (*Vigna radiata* (L.) Wilczek): Respond to Synthetic. Pesticide & Biopesticide. *International Journal of Research in Agricultural Sciences* Volume 1, Issue 6, ISSN (Online): 2348 – 3997).
- Singh, R.D., Arun Kumar K., Patra, A.K., Sahu, S.K., Khan, M.A., Bhople, B.S. (2014). Impact of Different Land Use Management on Soil Enzyme Activities and Bacterial Genetic Finger Prints of North –Western Himalayas. *Current World Environment*, 9(3):728-740.
- Swain, Sanjaya Kumar and Mahananda, Malaya Ranjan (2014). Effect of Monocrotophos, an Organophosphorus Pesticide on the Growth of Tadpoles of *Limnonectis Limnocharis*, a Rice Field Frog. *Natural Resources and Conservation* 2(1): 1-5,



## 2015

- Arunkumar, Singh, R. D. Patra, A. K. ,Sahu, S. K. ,Bhpole, B. S. Khan, M. A. and Nimje, A. (2015) Impact of canopy and seasonal dynamics on oak and pine soil microbial community composition and other biological indicators in Garhwal Himalayas. *Ecology, Environment and Conservation* ,21(suppl) 213-223.
- Behera, P.K., Pati, S. S. and Sahu, S. K. (2015) Treatment of municipal wastewater in UASB-reactors: introspection. In: *Advances in Environmental Sciences and Engineering*, A.K.Dash and M. Das(Eds.), Daya Publishing House, A Division of Astral International Pvt. Ltd., New Delhi( ISBN: 978-93-5124-336-6), pp.290-302.
- Bhadra, A.K., Pattanayak,S.K. and Dhal, N.K (2015). Plant species enumeration and  $\alpha$ -diversity study along BALCO road from foot hill to plateau top of Gandhamardan Hill Ranges, Western Odisha Phytotaxa Communicated on 12.7.2015and present status is ARCHIVED by the Journal
- Ernest, H, Arunkumar, Bhpole, B. S.,Srivastava, P. K. , Singh R.D. and Sahu, S. K.(2015) Soil quality and health management through farming practices: To ensure agricultural sustainability. *Research Journal of Pharmaceutical, biological and chemical sciences*, 6(4):1983-1992
- Mahananda, M.R. (2015). Biomedical waste generation and management practices in V.S.S. Medical College Burla, Odisha, India. *Energy and Environmental Engineering* 3(2):15-22
- Pradhan,A., Sahu S. K. and Dash, A. K. (2015) Changes in Physico-chemical characteristics of soil following application of rice mill wastewater under field irrigation conditions In: *Advances in Environmental Sciences and Engineering*, A.K.Dash and M. Das(Eds.), Daya Publishing House, A Division of Astral International Pvt. Ltd., New Delhi( ISBN: 978-93-5124-336-6), pp.480-492.
- Sahu, S. K. , Mishra, A. and Dash, A. K. (2015) Ambient air quality around OCL India Limited at Rajgangpur, Odisha, India. In: *Advances in Environmental Sciences and Engineering*, A.K.Dash and M. Das(Eds.), Daya Publishing House, A Division of Astral International Pvt. Ltd., New Delhi( ISBN: 978-93-5124-336-6), pp.459-479
- Mishra, S.P, Sahu, S. K. and **Behera, N.**(2015) “Reclamatory and Carbon Sequestration potential of a six year old Plantation on a degraded tropical soil from Odisha” In *Carbon Sequestration in Ecosystems*. (ed.) Asha Gupta, Bishen Singh Mahendra Pal Singh Publication, Dehradun . (Accepted, in press )
- Pradhan, A., Mishra, S.P, and **Behera, N.**(2015) “Conservation of ethnomedicinal plants through sacred groves: a case study from Bargarh district of Odisha (india)” In *Indegenous Knowledge and Plant Utilization* ISBN No. 978-81-7910-513-9. (ed.) Asha Gupta, Aavishkar Publishers, Jaipur. (Accepted)
- Mishra, S.P., Paramanik, T. and **Behera, N.**(2015) Effect of different chemical stimulators on gum production in *Sterculia urens* Roxb. and *Boswellia serrata* Roxb. and *Anogeissus latifolia* (DC.) Bedd. *Sambalpur University Journal of Science and Technology* (Accepted for publication).
- Pradhan A, Mishra, S.P., and **Behera, N.**(2015) Avian diversity in a sacred natural forest site in Odisha. *The Bioscan* (Accepted for publication).

### Snapshots of the Departmental Activities



The Department



Research Laboratory



ICEED-2011



NASEED-2013



Training Programme - 2013



Alumni Meet - 2015