

University with Potential for Excellence (UPE)

REPORT: 2009-2015



University of Mumbai



University of Mumbai

NAAC Accredited 'A' Grade University (2012-17) • University with potential for excellence

SANJAY DESHMUKH PhD
VICE-CHANCELLOR

No.VC/ECD/2015-16/

14th July, 2015

Sub.: Projects under UPE program of UGC : submission of Progress Report and statement of expenditure.

Sir,

With reference to your electronic communication dated April 21, 2015 thereby seeking from the University of Mumbai, progress report of UPE program alongwith the statement of expenditure upto March 31, 2015.

Please find enclosed herewith, a copy of the progress report as per the format prescribed by UGC alongwith the statement of expenditure incurred by various centers under UPE scheme.

I wish to bring to your kind attention the statement of expenses part of the Report, wherein an amount of Rs.5,13,50,248.58 has been shown as unspent amount. I hereby state that the said amount is already being committed towards expenses being incurred against various budget heads approved by UGC under UPE program towards (a) the construction of International Students' Hostel and a Guest House as well as (b) meeting expenses under UPE centers, as per the recommendations of UGC/UPE review committee.

You will be happy to note that the construction of the said Hostels and Guest House has reached a significant level and the entire work will be complete by March 31, 2016.

In view of the above, I wish to request you to allow us to utilize committed grants under UPE scheme (Phase I) till end of current financial year March 31, 2016. This will facilitate the process of completion of entire as work mentioned in the objectives of the scheme.

I look forward to your favourable consideration and positive reply to our request .

With warm wishes,

Yours sincerely,

SANJAY DESHMUKH

Dr. Nisar Ahmad Mir
Joint Secretary
University Grants Commission
Bahadur Shah Zafar Marg
New Delhi 110002.

Mobile: +91 9820 095 085 • Phone: +9122 2265 0403, +9122 2265 6789 • Fax +9122 2267 3579
E-mail: vc@fort.mu.ac.in • Website: <http://www.mu.ac.in> • Web: <http://SanjayDeshmukh.webs.com>
twitter: sanjaydeshmukh0

Mahatma Gandhi Road, Fort, Mumbai 400032, Maharashtra, India

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UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002

**Proforma for submission of Progress Report of Mumbai University under the Scheme
“Universities with Potential for Excellence” (UPE)**

I. Preliminary Introduction

1. **Name and address of University:** **University of Mumbai,**
M. G. Road,
Fort, Mumbai 400 032
Tel: +91-22-22702344
Fax:+91-22-22670325
Email: vc@fort.mu.ac.in
Website: www.mu.ac.in
2. **Name of Vice-Chancellor:** Prof. Sanjay Deshmukh, Ph.D.
3. **Tenure and Thrust :** 2009-2015, Green technology

II. Introduction

4. Brief introduction of the University and its faculties/courses:

The University of Mumbai (known earlier as University of Bombay) is one of the oldest and premier Universities in India. It was established in 1857 consequent upon "Wood's Education Dispatch", and it is one amongst the first three Universities in India.

As a sequel to the change in the name of the city from Bombay to Mumbai, the name of the University has been changed from "University of Bombay" to "University of Mumbai", vide notification issued by the Government of Maharashtra and published in the Government Gazette dated 4th September, 1996.

The University has Arts, Science, Commerce, Law, Management and Fine Arts Faculties. There are 66 departments and centres in the University. The University conducts Masters Degree Programmes, M. Phil and Ph.D programmes as well as Certificate, Diploma and Advanced Diploma Programmes. 51 new programmes commenced since 2010.

5. Student enrolment and Teaching staff:

(Category-wise i.e. SC, ST, OBC, PH, General, Male, Female, NRI students, Total)

Details of students' enrollment: (Annexure 1)

Details of teaching Staff: (Annexure 2)

6. Composition of UPE Advisory Committee, dates of meetings and important decisions taken:

Dr. A. K. Srivastava is the Convener of the UPE Facilitation Cell.
(Annexure 3).

Following are the members of the advisory committee.

Sr #	Name	Department	Designation
1	Vice Chancellor	University of Mumbai	Chairman
2	Prof. A. K. Srivastava	Department of Chemistry	Co-ordinator – UPE
3	Prof. Uma Vaidya	Department of Sanskrit	Member
4	Prof. Dushyant Kothari	Department of Physics	Member
5	Prof. Shefali Pandya	Department of Education	Member
6	Prof. Neeraj Hatekar	Department of Economics	Member
7	Prof. Surendra Jondhale.	Department of Political Science	Member
8	Prof. B. Venkatesh (Left University in 2011)	Rajiv Gandhi Centre of Contemporary Studies	Member
9	Librarian	University Library	Member

III. Research Profile

7. Focused Area under current Phase: (Achievements/Outcome after conferment of UPE Status):

Focused Area: Centre for Green Technology (Annexure 4)

8. Progress made/Research undertaken under Holistic Development of the University:

(Annexure 5)

9. Inter-disciplinary research programmes conducted during the current Phase of UPE:

All centres of the UPE (Total 13) were constituted based on Interdisciplinary approach and the programme was executed accordingly.

Reports of all centres have been attached. (**Annexure 6**)

10. **Research Publications by the teachers during the current Phase:**

Publications of University Major Departments:

- (i) National – 119
- (ii) International – 560
- (iii) **Impact factor of the papers published:**
0.00 – 24.38
- (iv) Number of Books published: 65

11. **Externally funded Research Project(s): (Annexure 7)**

- DST –PURSE scheme of Department of Science and Technology was granted to the University of Mumbai in the year 2009, in which Rs. 9.00 crores were allocated to all Science and Engineering Departments of the University.
- In phase 2 of the same programme, Rs. 17.5 crores had been approved with effect from 2015.

IV. Infrastructure

12. **Physical infrastructure developed out of UPE grant during current phase:**

A building named Green Technology Bhavan has been constructed on the Vidyanagari Campus of the University. The detail of it is given in **Annexure 8**.

13. **Academic infrastructure augmented out of UPE grant during current phase:**

- The computers procured by Centre for Computational Social Sciences have been extensively used for training students and processing of data.
- Dr. Babasaheb Ambedkar Centre for Social Justice has procured the following equipment which were used for documentation and training purposes: Computer (2) & Printer (2) & Laptops (3), LCD Projector (1), MP3 Recorders (3), Video Handy Camera (2), Digital Camera (1).\
- Centre for Multidisciplinary Research in Language and Literature conducts a post-graduate Diploma and Advanced Diploma in Mysticism.
- Centre for Palm Leaf Manuscripts conducts a course in Manuscriptology at three levels. Now one course of Diploma Level will be conducted during every academic year.

- The instruments procured e.g. High Performance Liquid Chromatograph are used to train Masters' students on regular basis.

V. Academic

14. Curriculum updating during current phase:

- Credit Grading Semester System introduced and the syllabi of all the courses have been revised and re-structured at UG/PG levels.
- The concept of Flexi syllabi was introduced in the subject of Zoology.
- Management stream and Board of Studies of Computer Science Statistics/Mathematics were separated within the Commerce faculty.
- Examination Reforms: Online exam forms and the Practical and Internal marks for third year B.A., B.Com., and B.Sc. for March 2013 were submitted by students and colleges. For ensuring security, CCTVs are being installed. Suggestion boxes have been placed to invite all stakeholders. The answer books are with OMR and Bar Codes.
- Delivery of Question papers to colleges through an encrypted web-link. Password is communicated to Principal/ Chief Conductor one hour before the examination. The question papers are downloaded and printed in the presence of Chief Conductor and Joint Chief Conductor. Question Paper Packets are opened by the Chief Conductor in the presence of Joint Chief Conductor and two students appearing in the examination. The whole process is monitored centrally from the Examination House using Information Technology.
- The University has decentralized the CAP centers for T Y B.Com, Engineering, Law & B.Sc. (IT), to ensure speedy assessment. Moreover, need based CAP centers are created depending on the examinations. Answer books are barcoded.
- The degree Certificate as well as the mark sheets now has seven security features to prevent counterfeit. The results of the examinations are published online on the University website. In case, a student does not clear an examination, revaluation facility is being provided on the website to apply for revaluation.

15. **New Course/s introduced during current phase**

51 courses were introduced in the current phase (**Annexure 9**)

16. **Number of students employed through placement during current Phase of UPE:**
Most of the students get jobs easily however exact data is not available.
17. **University-Industry Partnership during current phase:**
The University has collaborated with several agencies having signed MOU's.
(Annexure 10)
18. **Consultancy provided during current Phase of UPE and funds generated during current phase:**
Consultancy suggestions were provided to various colleges on academic matters and also, to some small-scale industries on voluntary basis.
19. **Collaboration – National, International during current phase:**
16 MOUs have been signed with several organizations for collaborations. MOUs and collaborations have been given in Annexure 11.
20. **Patents filed/obtained during current phase:**
17 patents were filed/obtained. (Annexure 12)
21. Academic Reforms introduced during current Phase:
(Annexure 13)
22. Community reach, Extension and Outreach Activities undertaken during current Phase.
(Annexure 14)
23. **Functioning of Internal Quality Assurance Cell (IQAC):**
The University has an Internal Quality Assurance Cell which meets regularly and submits the recommendation to the University from time to time. Also all departments of the University have IQAC at the Departmental level.

VI. Accreditation

24. Accreditation by NAAC/NBA (Institution / Courses): Reaccreditation
25. Date of Accreditation/Reaccreditation, Period, Grade, CGPA: Certificate Issued on 20/4/12, CGPA 3.05 A grade upto 19/04/2017

VII. Financial

26.	i)	Grants allocated	:	Rs. 300000000.00
	ii)	Grants released	:	Rs. 208500000.00
	iii)	Grants utilized	:	Rs. 209715202.50
	iv)	Interest accrued	:	Rs. 52565487.08

Unspent balance as on 31.3.2015: Rs. 51350284.58 (with interest)

- Out of the balance of Rs. 5,13,50,284.58, the expenditure of Rs.99,69,884.00 has been incurred on construction of International Hostel & Guest House and various centres of UPE upto 30th June, 2015.
- Out of the remaining balance of Rs. 4,13,80,400.58, an amount of Rs.70.00 lakhs is committed for the expenditure on various centres and Rs. 3,43,80,400.58 is committed for the construction of International Students' Hostel and Guest House.

Annexure 1

Categorywise Students Enrollment

All Department Students From 2009-10 to 2014-15

year	Intak C	SC		S.T.		D.T.		N.T.		OBC		S.B.C		Handicappedstu		N.R.I students		Foreign students		other categories		Minority student		OPEN		GRAND TOTAL		
		MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	MA	FE	TOTAL
2009-10	0	580	417	85	39	17	4	145	62	448	377	32	54	12	4			12	12	53	22	33	103	2738	3647	4155	4741	8896
2010-11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5153	5864	5153	5864	11017
2011-12	11296	2608	3116	331	304	80	80	704	719	2711	2998	319	344	0	0	0	0	0	0	0	0	0	0	26628	36273	33381	43834	77215
2012-13	11294	2931	3128	407	338	109	42	696	756	2856	3122	330	391	0	0	0	0	9	9	0	0	0	0	24045	31560	31383	39346	70729
2013-14	10765	584	426	84	35	4	2	94	51	293	223	26	30	0	0	0	0	12	9	0	0	0	0	2593	3358	3690	4134	7824
2014-15	5865	379	275	71	23	8	4	58	42	218	224	11	23	14	10	0	0	4	1	14	8	254	325	1080	1297	2111	2232	4343

Annexure 2

Teaching Staff

Mumbai University																				
Teaching Post																				
Professor																				
Sr. No	Name of the Department	Sanctioned Post	Reservation Accounting to Approved Post						Post filled Accounting to Reservation						Backlog					
			S.C	S.T	N.T	N.J	OBC	OPEN	S.C	S.T	N.T	N.J	OBC	OPEN	S.C	S.T	N.T	N.J	OBC	OPEN
1	Economics	8	0	1	1	1	1	4	1	0	1	0	0	1	0	1	0	1	1	3
2	Sociology	3	1	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	1
3	Civics and Politics	3	1	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	1
4	Centre for African Studies	2	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1
5	Centre for Eurasian Studies	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6	Statistics	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7	Applied Psychology	3	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	2
8	Law	4	0	1	1	0	0	2	0	0	0	0	0	2	0	1	1	0	0	0
9	English	4	0	1	1	0	0	2	0	0	1	0	0	1	0	1	0	0	0	1
10	Sanskrit	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
11	Mathematics	5	1	1	0	0	0	3	1	0	0	0	0	2	0	1	0	0	0	1
12	Linguistics	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
13	German	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
14	Russian	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
15	Arabic	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
16	French	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0

17	Persian	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
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Professor																				
Sr. No	Name of the Department	Sanctioned Post	Reservation Accounting to Approved Post						Post filled Accounting to Reservation						Backlog					
			S.C	S.T	N.T	N.J	OBC	OPE N	S.C	S.T	N.T	N.J	OBC	OPEN	S.C	S.T	N.T	N.J	OBC	OPEN
18	Chemistry	5	0	1	1	0	0	3	0	0	1	0	0	0	0	1	0	0	0	3
19	Physics	7	1	1	1	0	0	4	1	0	0	0	0	2	0	1	1	0	0	2
20	Marathi	2	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
21	Gujarati	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Hindi	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
23	History	4	1	1	0	0	0	2	0	0	0	0	0	2	1	1	0	0	0	0
24	Education	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
25	Sindhi	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
26	Geography	5	1	1	0	0	0	3	1	0	0	0	0	1	0	1	0	0	0	2
27	Music	3	1	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	2
28	Kannada	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
29	Commerce	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
30	Life Sciences	5	1	1	0	0	0	3	1	0	0	0	0	1	0	1	0	0	0	2
31	Urdu	2	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1
32	Philosophy	4	1	1	0	0	0	2	0	0	0	0	0	2	1	1	0	0	0	0
33	Library	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	Total	86	15	10	5	1	1	54	9	0	3	0	0	22	7	10	2	1	1	32

Mumbai University

Teaching Post

Associate Professor																				
Sr. No	Name of the Department	Sanctioned Post	Reservation Accounting to Approved Post						Post filled Accounting to Reservation						Backlog					
			S. C	S. T	N. T	N. J	OB C	OPE N	S. C	S. T	N. T	N. J	OB C	OPE N	S. C	S. T	N. T	N. J	OB C	OPE N
1	Economics	10	0	1	1	1	2	5	0	0	1	0	0	5	0	1	0	1	2	0
2	Sociology	6	1	1	1	0	0	3	1	0	1	0	0	0	0	1	0	0	0	3
3	Civics and Politics	6	1	1	1	0	0	3	1	0	1	0	0	3	0	1	0	0	0	0
4	Centre for African Studies	4	1	1	0	0	0	2	0	0	0	0	0	1	1	1	0	0	0	1
5	Centre for Eurasian Studies	3	1	0	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	1
6	Statistics	3	1	0	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	1
7	Applied Psychology	4	1	1	0	0	0	2	1	0	0	0	0	2	0	1	0	0	0	0
8	Law	4	0	1	1	0	0	2	0	0	0	0	0	1	0	1	1	0	0	1
9	English	5	1	1	0	0	0	3	1	0	1*	0	0	2	0	1	0	0	0	1
10	Sanskrit	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
11	Mathematics	8	1	1	1	0	1	4	1	0	0	0	1	2	0	1	1	0	0	2
12	Linguistics	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
13	German	3	1	0	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	1
14	Russian	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
15	Arabic	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
16	French	2	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1
17	Persian	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

Associate Professor																				
Sr. No	Name of the Department	Sanctioned Post	Reservation Accounting to Approved Post						Post filled Accounting to Reservation						Backlog					
			S. C	S. T	N. T	N. J	OB C	OPE N	S. C	S. T	N. T	N. J	OB C	OPE N	S. C	S. T	N. T	N. J	OB C	OPE N
18	Chemistry	7	1	1	1	0	0	4	1	0	0	0	0	2	0	1	1	0	0	2
19	Physics	7	1	1	1	0	0	4	1	0	0	0	0	1	0	1	1	0	0	3
20	Marathi	3	0	1	0	0	0	2	0	1	0	0	0	2	0	0	0	0	0	0
21	Gujarati	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
22	Hindi	3	1	0	0	0	0	2	1	0	0	0	0	2	0	0	0	0	0	0
23	History	8	1	1	0	1	1	4	1	0	0	0	0	2	0	1	0	1	1	1
24	Education	3	1	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	1
25	Sindhi	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
26	Geography	6	1	1	1	0	0	3	1	0	0	0	0	3	0	1	1	0	0	0
27	Music	4	1	1	0	0	0	2	1	0	0	0	0	2	0	1	0	0	0	0
28	Kannada	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
29	Commerce	2	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
30	Life Sciences	2	0	1	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0
31	Urdu	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
32	Philosophy	4	1	1	0	0	0	2	0	0	0	0	0	2	1	1	0	0	0	0
33	Library	3	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	2
	Total	121	22	16	8	2	4	69	14	1	3+	0	1	44	8	15	5	2	3	25

Mumbai University																				
Teaching Post																				
Assistant Professor																				
Sr. No	Name of the Department	Sanctioned Post	Reservation Accounting to Approved Post						Post filled Accounting to Reservation						Backlog					
			S. C	S. T	N. T	N. J	OB C	OPE N	S. C	S. T	N. T	N. J	OB C	OPE N	S. C	S. T	N. T	N. J	OB C	OPE N
1	Economics	7	0	1	1	0	1	4	*1	0	1	0	0	1	0	1	0	0	1	3
2	Sociology	7	1	1	1	0	0	4	1	1	1	0	0	3	0	0	0	0	0	1
3	Civics and Politics	5	0	1	1	0	0	3	0	1	1	0	0	3	0	0	0	0	0	0
4	Centre for African Studies	4	1	1	0	0	0	2	0	0	0	0	1*	2	1	1	0	0	0	0
5	Centre for Eurasian Studies	2	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1
6	Statistics	6	1	1	1	0	0	3	0	0	1	0	0	2	1	1	0	0	0	1
7	Applied Psychology	9	0	1	1	1	1	5	0	0	0	1	1	2	0	1	1	0	0	3
8	Law	7	0	1	1	0	1	4	0	0	1	0	1	4	0	1	0	0	0	0
9	English	2	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
10	Sanskrit	3	1	0	0	0	0	2	1	0	0	0	0	2	0	0	0	0	0	0
11	Mathematics	7	1	1	1	0	0	4	1	0	1	0	0	3	0	1	0	0	0	1
12	Linguistics	2	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
13	German	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
14	Russian	2	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1
15	Arabic	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
16	French	4	1	1	0	0	0	2	0	0	0	0	0	0	1	1	0	0	0	2
17	Persian	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

Assistant Professor																				
Sr. No	Name of the Department	Sanctioned Post	Reservation Accounting to approved Post						Post filled Accounting to Reservation						Backlog					
			S.C	S.T	N.T	N.J	OBC	OPEN	S.C	S.T	N.T	N.J	OBC	OPEN	S.C	S.T	N.T	N.J	OBC	OPEN
18	Chemistry	14	2	1	1	0	3	7	2	1	0	0	3	6	0	0	1	0	0	1
19	Physics	14	2	1	1	0	3	7	1	1	1	0	3	4	1	0	0	0	0	3
20	Marathi	3	1	0	0	0	0	2	0	0	0	0	0	2	1	0	0	0	0	0
21	Gujarati	2	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
22	Hindi	5	1	1	0	0	0	3	1	1	0	0	0	3	0	0	0	0	0	0
23	History	7	1	1	1	0	0	4	0	1	1	0	0	3	1	0	0	0	0	1
24	Education	2	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0
25	Sindhi	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
26	Geography	9	1	1	1	0	1	5	1	1	1	0	1	2	0	0	0	0	0	3
27	Music	5	1	1	0	0	0	3	1	0	0	0	0	2	0	1	0	0	0	1
28	Kannada	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
29	Commerce	2	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
30	Life Sciences	4	1	1	0	0	0	2	1	0	0	0	0	2	0	1	0	0	0	0
31	Urdu	5	1	1	0	0	0	3	0	0	0	0	0	1	1	1	0	0	0	2
32	Philosophy	7	1	1	1	0	0	4	1	0	1	0	0	3	0	1	0	0	0	1
33	Library	3	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	2
	Total	158	30	18	12	1	10	87	18+1	7	10	1	9+1	58	13	11	2	0	1	29

Annexure 3

Minutes 2009-2015

No.	Date	Agenda
1	<p>16/ 07/ 2009</p> <p>Convened by Hon'ble VC</p> <p>Venue: Management Council Room, Ambedkar Bhavan.</p>	<p>This was the first meeting after the receipt of the final approval. Report of the UGC committee was given to all the co-ordinators. The constitution of the interview committee for appointment of the JRF / Project Fellows was decided and clarified by the Hon'ble VC. Dr. S. R. Pandya stated that for the Center for Educational Research, there was no provision for either Printing & Stationery or Contingency thereby making it impossible for the members of the Center to purchase stationery for collecting data which is an extremely important part incidence in Social Science Research though the Center had proposed the item specifically in the Budget in the presentation made before the UGC team.</p> <p>Dr. Pandya offered a room in the Department of Education, Maulana Abul Kalam Azad Bhavan for setting up the UPE Facilitation Cell office.</p>
2	<p>21/ 07/ 2009</p> <p>Convened by Dr. A. K. Srivastava, CDC Chairman.</p> <p>Venue : Seminar Hall, Dept of Chemistry</p>	<p>This was the second meeting under UPE scheme after the receipt of the UGC report. The minutes of the first meeting duly signed by the Hon'ble Vice-Chancellor (copy enclosed) were read out and passed.</p> <ul style="list-style-type: none">(i) The issue of purchase of equipments in the first year was discussed.(ii) The procedure for the appointments of the research fellows was discussed and the members were informed that the advertisement for the positions in all the categories should appear on the notice boards of various departments, University website and should also be sent to the colleges concerned.(iii) Framing of selection committee was discussed and members were informed that the selection

		<p>committee be constituted for each center separately with the following members :</p> <p>(a) Co-ordinator, Facilitation Cell / Convener, Steering Committee, (b) VC's nominee, (c) Principal Investigator, (d) External Subject Expert.</p>
3	<p>18/ 08/ 2009</p> <p>Convened by Hon'ble VC</p> <p>Venue : Management Council Room, Ambedkar Bhavan</p>	<p>This was the third meeting under UPE Scheme in which different issues regarding UPE projects were discussed.</p> <p>(i) The Hon'ble VC approved the requirements of various virtual centers for the initial year submitted by the project co-co-ordinators and they were advised to follow the UGC and University guidelines for purchase, appointments etc.</p> <p>(ii) The Hon' ble VC made two important announcements</p> <p>(a) Dr. Uma Vaidya was appointed as the convener of the Steering Committee. (b) Dr. S. R. Pandya will work in place of Dr. Pratibha Gokahle as the member of the Facilitation Cell of the UPE Scheme.</p>
4	<p>27/ 08/ 2009</p> <p>Convened by CDC</p> <p>Venue : J. N. Library</p>	<p>F & A/C Officer was requested to guide and address the members of UPE Center-s and the Heads of the Dept.-s about rules and procedures of using money for the UPE Schemes and other projects. Modalities of using money were discussed with him. (Minutes in detail are enclosed).</p>

5	<p>31/ 08/ 2009</p> <p>Convened by Dr. Uma Vaidya</p> <p>Venue : HOD's Room Dept of Chemistry</p>	<p>A meeting of the members of the Facilitation cell was convened to distribute the work among them.</p>
6	<p>05/ 12/ 2009</p> <p>Convened by Dr. Uma Vaidya</p> <p>Venue : Seminer Hall, Dept. of Chemistry</p>	<p>(i) Academic progress reports were submitted by Co-ordinators of a few centre-s</p> <p>(ii) Members expressed difficulties regarding some procedures and Prof. Srivastava had given solutions to their problems.</p>
7	<p>11/ 03/ 2010</p> <p>Convened by Dr. Uma Vaidya</p> <p>Venue : Seminer Hall, Dept. of Chemistry</p>	<p>(i) Fresh Academic progress reports were submitted by Co-ordinators of 8 groups.</p> <p>(ii) Some Co-ordinators complained about pending bills and opined that the accounts section need to cleat them at the earliest.</p> <p>(iii) The Group for Research on the Indian Diaspora (GRID) expressed difficulties as no equipment grants were sanctioned and requested to grant if from University's General Funds. It was resolved to suggest that either it should be sanctioned from the General Funds or from the interest accrued on the UGC Grant for the UPE Scheme. A letter from Dr. Bhosle was discussed in this light and a note was submitted by Dr. A. K. Srivastava.</p>
9	<p>24/ 07/ 2010</p>	<p>It was a meeting of the members of the Facilitation Cell and Steering Committee of UPE in which the details of</p>

	<p>Convened by Dr. Uma Vaidya</p> <p>Chaired by : Hon'ble VC Dr. Rajan Welukar.</p> <p>Venue : MC Room, Ambedkar Bhavan</p>	<p>the UPE scheme were discussed and the Hon'ble VC directed the Center Co-ordinators to present the details about their projects through Power-Point Presentations. It was decided that the next meeting be organized on 10th August 2010.</p>
10	<p>10/ 08/ 2010</p> <p>Convened by Dr. Uma Vaidya</p> <p>Venue : Seminer room, Dept. of Chemistry</p>	<p>The newly appointed Hon'ble VC Dr. Rajan Welukar was briefed about the UPE Progress. Dr. A. K. Srivastava presented the details about the UPE scheme to the new VC. All the Center Co-ordinators along with their research teams were present. They made presentations about the research work and the progress of the projects. The Hon'ble VC orally agreed that those projects for which UGC had not sanctioned funds for equipments will get funds for the same from the University General fund. Accordingly, the cases of the two projects i.e. the GRID project and The Awakening: Literature of the Dalits in India were presented and discussed.</p> <p>Similarly, The Center for Research in the Field of Education was not given any funds for printing and stationery or as contingency. The Hon'ble VC agreed to release Rs.10000 for the same from the University General Fund.</p>
11	<p>02/ 11/ 2010</p> <p>Convened by Hon'ble Vc Dr. Rajan</p>	<p>An MOU was signed between University of Mumbai and ICT, Matunga, for participation in the Green Technology Project as a joint venture. The Hon'ble VC from the University and Dr. G. D. Yadav from ICT signed the MOU. Dr. Rajpal Hande, Director BCUD, Dr. A. K.</p>

	<p>Welukar.</p> <p>Venue : MC Room Fort.</p>	<p>Srivatava, Co-ordinator, Facilitation Cell and Dr. Uma Vaidya, Convener, Steering Committee were present for the meeting. MOU with ICT was signed by the Hon. Vice-Chancellor and Director, ICR for the project of Green Technology as per suggestion in UGC-Report in the presence of heads of the Science-departments concerned. In the same meeting, the sanctioned amount was divided between two institutes.</p>
12	<p>03/ 12/ 2010</p> <p>Convened by Dr. A. K. Srivastava</p> <p>Chaired by : Hon'ble VC.</p> <p>Venue : Seminer Hall, Dept. of Chemistry.</p>	<p>A meeting of the Heads of the science Departments was conducted under the chairmanship of Hon'ble VC for the implementation of the projects of Center for Green Technology in the University of Mumbai. 10 research fellowships were allocated to 4 science departments.</p>
13	<p>07/ 01/ 2011</p> <p>Convened by Dr. Uma Vaidya</p> <p>Venue : Seminer Hall, Dept. of Chemistry</p>	<p>The work done by the UPE Center-s was reviewed and some suggestions were given to accelerate the work.</p>
14	<p>5.4.2011</p> <p>Convened by Dr. Uma Vaidya</p>	<p>Three centre Co-ordinators, Dr. Gokhale, Dr. Bhosale and Dr. Deepti Mukherji expressed their inability to attend due to examination-related duties. Shri Mujumdar orally conveyed his leave of absence. The Center Co-ordinators were requested to submit an exhaustive report (academic as well as administrative) till 31st March 2011.</p>

	Venue : Seminar Hall, Dept. of Chemistry	
15	17/ 06/ 2011 Convened by Dr. Uma Vaidya Chaired by Dr. Rajpal Hande. Venue : Room No. 128 on the fort Campus	Dr. A. K. Srivastava offered some comments on the progress of different centers and explained the status of the Centre for the Green technology. The Center Co-ordinators made power-point presentations about the work of their centres and the problems encountered.
16	20/ 06/ 2011 Convened by Dr. Uma Vaidya Venue : The UPE Office, Dept of Education	A meeting of the Co-ordinators - UPE and the Convener - Facilitation Cells was held to discuss the problems of The Center for Geo-ingormatics and The Digital Knowledge present. Suggestions were given to solve her problems and the Center has geared up its activities. Dr. Ambadas Jadhav was not available for discussion.
17	20/ 07/ 2011 Convened by Dr. A. K. Srivastava Venue : MC Room of Dr. Ambedkar	This was a meeting of UPE center Co-ordinators. Dr. A. K. Srivastava conducted the meeting and also conveyed the message from Hon'ble Director BCUD that the meeting of the UPE centre Co-ordinators will be organized on third Wednesday of every month. The GRID project Co-ordinator spoke about the infrastructural difficulties. In general, it was expressed that because of administrative delays, the work is being

	Bhavan	stuck and the expected progress cannot be made. Dr. B. V. Bhosale and Dr. Ratilal Rohit supported the general expression very strongly Dr. Neeraj Hatekar requested permission to appoint short-time assistants for data collection.
18	14/ 09/ 2011 Convened by Dr. Uma Vaidya Dr. A. K. Srivastava Venue : MC Room of Dr. Ambedkar Bhavan	The main problem of the space to station the sanctioned computers was discussed. The Department of IT was requested to provide some space to station the computers and it was orally accepted by the Head of the Dept. The correspondence about the issue will be sent to the Vice-Chancellor for approval. The Co-ordinator of the centre was requested to issue the membership letters to the two new members i.e. Dr. R. Srivaramangai from the Dept. of IT and Dr. Jyotsna Dongardive from the dept. of Computer Science who have worked on syllabus committee of the center. The centre Co-ordinator was requested to procure the equipments at the earliest, The centre Co-ordinator was also requested to send the up to date report and future plan as it is to be sent to UGC urgently (in consultation with the members of the centers) It is also suggested that the publications of the faculty be stressed in the report.
19	27/0 4/ 2012 Convened by Dr. Uma Vaidya Dr. A. K. Srivastava Chaired by : Pro-Vice- Chancellor Venue : Seminar room Ramkrishna Bajaj Sanskrit	A review was taken of the work done by the center-s some pending issues were discussed which are to be pointed out to review-committee. Members are requested to be prepared for the visit of Review-committee.

	Bhavan	
20	<p>20/ 06/ 2012</p> <p>Convened by Dr. Uma Vaidya Dr. A. K. Srivastava</p> <p>Chaired by VC.</p> <p>Venue : MC Room of Dr. Ambedkar Bhavan</p>	<p>The minutes of the earlier meeting were confirmed. Dr. Srivastava briefed for this meeting. The members were requested to submit one page report of the work done on the given guidelines. The accounts-officer was present and had given some guidelines about the procedures of passing the bills. The Pro-Vice-Chancellor assured the facilitation from the administrative side. The Vice-Chancellor guided the members for the progress in the work.</p>
21	<p>27/ 06/ 2012</p> <p>Convened by Dr. Uma Vaidya Dr. A. K. Srivastava</p>	<p>This was the follow up meeting for the earlier meeting. Most of the Center-Co-ordinators have submitted the one page report as requested in the last meeting. Again the pending issued were discussed.</p>
22	<p>16/ 07/ 2012</p> <p>Convened by Dr. Uma Vaidya Dr. A. k. Srivastava</p> <p>Chaired by Hon Pro Vice- Chancellor</p>	<p>All Center-Co-ordinators along with Steering Committee members were present for the meeting. The Review-Committee-Visit was expected in the month of August 2012 and thus guidance was given about how to prepare for the visit.</p>

23	21/ 12/ 2012 Convened by Dr. Uma Vaidya Dr. A. K. Srivastava	Both the office-bearers have discussed the pending issued to be brought to the notice of the Review-committee. Some committees were formed to manage the visit of the committee in smooth way.
24	16/ 06/ 2013 Convened by Dr. Uma Vaidya Dr. A. k. Srivastava Chaired by Hon Pro Vice- Chancellor Dr. Naresh Chandra Dr. Rajpal Hande	<ol style="list-style-type: none"> 1) To seek guidance from the authorities about the visit and preparation. 2) I have sent one letter to all center Co-ordinators informing about visit dates. In the second letter I have requested for same information. If it is ready with you please submit after the meeting. 3) We have prepared a rough action plan framed a few committees time table for three days and some guide line for all of you. It will be sent to you after final sanction from the Vice-Chancellor . With this information I request the VC to guide the entire research time.
25	25/ 04/ 2014 Convened by Dr. A. k. Srivastava Chaired by Hon'ble Vice- Chancellor Dr. Rajan Welukar Venue : MC Room of Dr. Ambedkar Bhavan	<ol style="list-style-type: none"> 1) All the Centers Co-ordinators presented their plan and finalized the details of the budget for the entire period 2) The Centre for palm Leaf Manuscript will be given Rs. 4 lakhs form other centers' grant which will be adjusted after the release of last installment from the UGC. 3) Dr. Deshmukh was advised to discuss the work plan for the center for finalization of the budget with the Pro Vice Chancellor. 4) It was decided that teachers after superannuation can continue working with the center. However' they cannot claim office facility and office space in the University

26	<p>13/ 06/ 2014</p> <p>Convened by Dr. A. K. Srivastava</p> <p>Venue : Department of Chemistry</p>	<ol style="list-style-type: none"> 1) Dr. Gauri Mahulikar said that the project fellow for PLM has resigned. Fresh interviews need to be conducted. She also added that in the earlier meeting, Prof. Hatekar had offered to help for data entry. One of his Project fellows did submit a soft copy of the entered matter. But due to incompatible fonts, further work is halted. Prof. Srivastava suggested to purchase the fonts from the budgetary allocation. 2) Dr Madhavi Narsalay said fresh appointment of project fellow for the project on Dalit literature will be done soon. 3) Prof Srivastava said that there is no budgetary provision for UPE Facilitation Cell. Therefore, it has been proposed in the meeting that out the Upgradation and Infrastructure Budget, Rs. 10 Lakhs should be allocated for the Facilitation Call. A letter requesting approval from the Hon. Vice-Chancellor will be sent. 4) It was resolved in the meeting that efforts will be made to utilize the grant in proper form and strengthen the academic work of the UPE.
27	<p>18/ 07/ 2014</p> <p>Convened by Dr. A. K. Srivastava</p> <p>Chaired by Pro Vice-Chancellor Dr. Naresh Chandractor Dire BCUD Dr. Rajpal Hande</p> <p>Venue : MC Room of Dr. Ambedkar Bhavan</p>	<ol style="list-style-type: none"> 1) Prof . A. K. Srivastava briefed the members of the committee that regarding the upgradation and infrastructure, he is in touch with the University Engineer and that rate contract has been approved. He said that Rs. 544 lakhs has been allocated to the International Students Hostel out of which we have spent Rs. 364 lakhs. Rs. 3.64 crores have been allocated for the Guest House which we need to spend as early as possible and solve the issues related with it We have Rs. 3.75 crores for up gradation which needs to be done at the discretion of the University. 2) Prof. A. K. Srivastava asked all the committee members to finish off the allocated amount by Nov. 2014 so that we can ask for disbursement of the remaining amount. He also added that non-spending center money will be diverted to centers in need of money. By December end the Utilization Certificate should reach the UGC.

		<p>3) Prof. Renu Modi, center co-ordinator of GRID said that as her center has organized a seminar in the month of January, she will be able to spend the amount by January itself. Prof. Kothari suggested a solution of taking advance by the month of November. Dr. Renu Modi said that the GRID is participating in e-pathshala program of the UGC and writing modules for the same.</p> <p>4) Prof. Hatekar said that center for computation in social science has received the Asia Media Effectiveness Award. They are proceeding with the MOU with the company.</p> <p>5) Dr. Gauri Mahulikar briefed the success of the visit to the Saraswati Mahal Labrary, Thanjavur.</p> <p>6) Dr. Madhavi Narsalay mentioned about the visit to Chinmay Vibhooti Centre at Kolvan and added that talks are going on with the research scholars of the Varkari Sampraday for studies in Dnyeshwari and allied literature.</p>
27	<p>22/ 09/ 2014</p> <p>Convened by Dr. A. K. Srivastava</p> <p>Chaired by Pro Vice-Chancellor Dr. Naresh Chandractor</p>	<p>1) Dr. Renu Modi informed that a letter regarding the International Conference of GRID in January 2015 has been issued to the Hon'ble Vice-Chancellor.</p> <p>2) Dr. Srivastava said that the amount of the UPE budget needs to be spent by November 2014 end.</p> <p>3) Hon'ble Pro Vice-Chancellor suggested that an independent CA be appointed to streamline the accounts.</p> <p>4) Dr. Srivastava mentioned that the Auditorium of the Green Technology Building is almost ready and the concerned party wanted to demonstrate the working of certain instruments and experiments. It was resolved that the requirements of the party regarding experiments be fulfilled.</p> <p>5) Dr. Narsalay said that the Centre for Consciousness Studies of Kaivalyadham is interested in having a collaboration with the CMR. The cell suggested that if no finances are involved one may proceed for go ahead with MOU.</p>

28	<p>09/ 02/ 2015</p> <p>Convened by Dr. A. k. Srivastava</p> <p>Chaired by Hon'ble Vice- Chancellor Dr. Rajan Welukar</p> <p>Venue : Dep. Of Chemistry</p>	<ol style="list-style-type: none"> 1) Whatever allocations have been made to the centers by the University Grants Commission should be honored and the centers should be allowed to spend full allocated amount. The allocation of approximately Rs. 13.6 crores has been sanctioned to international student's hostel, Guest House and Up-gradation of infrastructure and the amount spent is only on international students' Hostel, which is Rs. 33.71 lakhs. This should be looked into seriously. 2) The Jawaharlal Nehru centre has submitted a proposal for re-appropriation of budget head for approval based on the approved work plan by the University Grants Commission Committee, which should be forwarded for immediate approval. 3) The Centres which have utilized the grant efficiently as par UGC allocation may be given grants from the unspent grants. 4) A Committee needs to be formed for preparation of new UPE proposals for UPE phase II. 5) It was unanimously felt that the meeting with the Hon'ble Vice-Chancellor be arranged at his earliest convenient time to seek his guidance and approval on utilization of the unspent amount as the UPE programmer will end on 31st March, 2015 as par the UGC committee recommendation.
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Annexure 4

Focused Area: Centre for Green Technology (outcome)

Brief report

The Centre for Green Technology is the core Centre of the UGC-UPE scheme which was implemented in the University in July 2009. This was the only centre which was recommended by the UGC for construction of a new building. The Green Technology building has been constructed near the Nanotechnology building on the Vidyanagari Campus of the University. The total area of the Green Technology Bhavan is 14,000 sq. ft. The building has three floors (ground + 2) with a mezzanine floor. A state of art auditorium with a seating capacity of 230 has been constructed. The laboratories, classrooms and faculty rooms are on the first & second floors which have to be furnished. The detail of the building is given in the table below (next page).

The participating departments from the University in the Green Technology centre are: Chemistry, Physics, Life Sciences and Biotechnology. Ten research fellows are working in the centre out of which 08 are registered for Ph.D. degree. The Centre has published 142 (University of Mumbai – 62 & ICT – 80) papers in the international journals with high impact factors. The major outcome of the research activities of the centre is in the following interdisciplinary areas:

- Electrochemical sensors for inorganic and biologically important molecules.
- Low cost non-noble metal catalysts for efficient hydrogen production for Fuel-cells
- Efficient visible light photocatalysts to degrade non-volatile organic solvents and industrial dyes in aquatic medium
- Synthesis and Properties of Light Emitting Polyfluorenes Containing Cyanine Dye Moiety
- Development and Applications of New Chiral (optically active) compounds.
- Isolation, characterization and Biological evaluation of Natural Components from Tulsi Plant (*Ocimum Sanctum*)
- New M.Tech (Green technology) course is started by Institute of Chemical Technology, Mumbai in the year 2013-14

The detailed report of the Centre for Green Technology is given in **Annexure 6**.

Details of Green Technology Building:

Total area 14,000 sq. ft.

Sr.No.	Description	Size (m)	Area (Sq m)	Capacity (nos.)	No. of rooms	Total Capacity
1	Ground Floor					
i	Seminar hall	34 x 11.23	381.82	304	1	304
ii	Administration	6.8 x 5.5	37.40	10	1	10
2	Mezzanine					
i	Administration	9.6 x 5.5	52.80	12	1	12
3	First Floor					
i	Lab Type-1	8 x 11.23	89.84	24	2	48
ii	Lab Type-2	11.23 x 11.23	126.11	36	2	72
iii	Classroom	5.5 x 6.2	34.10	24	1	24
iv	Faculty Room	2.8 x 3.6	10.08	1	9	9
4	Second Floor					
i	Lab Type-1	8 x 11.23	89.60	24	2	48
ii	Lab Type-2	11.23 x 11.23	126.11	36	2	72
iii	Classroom	5.5 x 6.2	34.10	24	1	24
iv	Faculty Room	2.8 x 3.6	10.08	1	9	9

Annexure 5

Holistic Development: 2010-2015

- Credit Grading Semester System introduced and the syllabi of all the courses have been revised and re-structured at UG/PG levels.
- The concept of Flexi syllabi was introduced in the subject of Zoology.
- Management faculty and Board of Studies of Computer Science, Statistics/Mathematics were separated in the Commerce faculty.
- Collaboration with the Commonwealth of Learning for Development of Open Education Resources (OER).
- Hawaii University submitted the proposal under Singh-Obama initiative to establish Center of Excellence in Community Colleges.
- **MOU/Agreement with Foreign Universities and other organizations**
 1. Collaboration MoU with University of Picardy Jules Verne, France
 2. MoU with I.M.C. for the Institution of the I.M.C. Pravinchandra Gandhi Chair on Banking and finance
 3. MoU with Reserve Bank of India.
 4. MoU with Edith Cowan University (Australia)
 5. MoU with Tainjin University of Technology (People's Republic of China)
 6. MoU with Tainjin Normal University
 7. MoU with between University of Mumbai and Nankai University.

8. MoU with between Deakin University (Deakin), Australia and University of Mumbai India.
9. MOU with Hindustan Coca-Cola Beverages Pvt. Ltd.(Sales Management/Retail training.)(Smart Course)
10. MOU with University of Hawai'i system Kapi'olani Community College Hawai'i.
11. MoU with The Board of Trustees of the University of Illinois, USA.
12. MoU with Confucius Headquarters of China on the Establishment of Confucius Institute
13. MoU with CSIR National Institute of Oceanography Dona Paula, Goa
14. Agreement for Cooperation with University of Paris
15. Agreement for Cooperation with University of Gottingen, Germany
16. MoU with Indian Air Force University Department of African Studies

- **Previously Incomplete project Completed in :**

- Construction of Gymnasium of Sports Complex, Swimming Pool at Sports Complex, Building for Dept of Computer Science (IT Park), Culture Centre, Extension of Lecture Complex (Phase II), School of Language Building at Vidyangari Campus

- **Ongoing Projects :**

- Repairing of Existing Compound Wall and Construction of New Compound Wall at Thane Campus.
- Construction of the following buildings at Vidyanagari Campus, Faculty Building for Centre for Excellence in Basic Sciences, Hostel Building for Centre for Excellence in Basic Sciences, Nano Science and Nano Technology Centre, Green Technology Building,

Shankarrao Chavan Teachers Training Academy, Main Gate and Arch Connecting to CST Road and Hans Bhugara Marg, Addition and Alteration and Construction of Second Floor of Existing Marathi Bhasha Bhavan, Design Supply and Installing of pre-fabricated Compound Wall , Construction and laying 400 mtr. 8 lane Synthetic Athletic Track at Sports Pavilion, Madam Kama, Ladies Hostel Plot No. 179, 3rd Floor.

- Repairs and Restoration of the Rajabai Clock Tower and Library Building at Fort
- Work of Providing and laying of Sport Flooring (IHF/FIBA/BWF/WSF Approved) Including all civil and sub waterproofing works, for the Hall at Gymnasium Building
- New Exam House
- International Student Hostel
- Proposed Construction of Library Building
- Construction of Squash Court in the Gymnasium Building
- Construction two Nos. of Basket Ball Court
- Construction of Women Hostel
- Construction of 3 nos. sub-station
- Academic Block under Phase II Sub Centre Ratnagiri
- Rajiv Gandhi Building (Phase II)
- Construction of First Phase of Kalyan Sub-Centre

- Construction of Proposed academic Building at Mauje Dhokali & Balkum Tal. Thane
- Construction of Balance portion @ 3rd Floor at Madam Kama Girls Hostel, 179 Backbay Reclamation, Mumbai
- Proposed construction of pre-fabricated structure for college building (I-Phase) at Ambadave, Tal- Mandangad, Dist- Ratnagiri
- **Prospective Planning**
- Proposed Electromechanical/filtration works for swimming pool I - Vidyanagari Campus
- Model College, at Talere, Tal- Kankavali, Dist- Sindhudurg, Sindhu Swadhyay College at Zarap Dist. Sindhudurg, Model College, Ambadave, Mandangad, Ratnagiri, Hostel for Boys and Girls at Thane under Babu Jagjeevanram Chatravas Yojana, Class I, Class II, Class III and Class IV Quarters, Hostel for Boys and Girls at Vidyanagari under Babu Jagjeevanram Chatravas Yojana, Hindi Bhasha Bhavan and Urdu Bhasha Bhavan, Multi-purpose Indoor Hall, Hostel for SC/ST/DT/OBC Girls and Boys
- Design Supply, Installation, Commissioning Solar system
- Storm Water Drain and Sewer Line, Rain Water Harvesting
- International Convention Centre
- Auditorium for GICED
- Additional Floor and Alteration of Existing GICED Building
- Design Supply and Installing of pre-fabricated Compound Wall at Fort
- Repairs and Restoration of Heritage Main Building at Fort
- Construction of Track at Vidyanagari Campus

- Repairs and Improvement of Internal Roads in Vidyanagari Campus
- Granted autonomy to 11 colleges & depts. In process of autonomy - 9 colleges
- Establishment of 4 Community colleges in collaboration with HCCB .
- Establishment of community college of Tourism and Hospitality at Ratnagiri sub center.
- Completed Audit of Accounts from 2007-08 till 2010-11 and 2011-12 on the verge of completion.
- Income from investment increased from Rs.676.35 lakh (2009-10) to Rs.1105.04 lakhs, an increase of 63.38%.
- Investment increased from Rs.40777.06lakh (2009-10) to Rs.52162.67 (Till Dec2013) an increase of 28%.
- IDOL on-line admission process - receipt of students' fees of students (about 32 crore).
- **Resource mobilization:**
- Funds from funding agencies including UGC, MHRD, Govt. of India, State Govt., Alumni, Various Fees, Interest, etc. (55395.35 lakh during last 36 months),.
- Notable among Alumni are Shri Asit Koticha- Rs. 30.0 crore for International Convention Center, Rs. 5 crore for Dept. of Philosophy.
- International organizations like European Commission: Rs. 3.5 crore, British Columbia Govt.: Rs. 0.44 crore, Peoples Republic of China: Rs. 0.75 crore, US Army to Dept. of Chemistry: Rs. 0.16 crore.
- UGC XII plan Rs.11 Crores for a state of art library building at Vidyanagari campus.

- Partnership with the Industry : Rs. 4.20 crore from Tata Consultancy Services Ltd. for restoration of Rajabai Tower, Rs. 2.0 crore from the Indian Merchant Chamber for Chair in Finance, Reliance Industries Ltd.: Rs. 0.70 crore, Reserve Bank of India for RBI Chair: Rs. 2.0 crores, HCCB Ltd.: Rs. 0.28 crore
- Contribution received from UGC, DST, Govt. etc.
 - UGC : Rs.10.02 crore
 - DAE/BRNS : Rs. 0.33 crore
 - DST : Rs. 0.19 crore
 - DBT : Rs. 0.24 crore
 - Inter University Accelerator Center : Rs.0.03 crore
 - Indian Academy of Sciences : Rs. 0.033 crore
 - Planning Commission : Rs. 0.16 crore
 - State Govt. for Synthetic Athletics Track : Rs. 3.16 crore
 - State Govt. for Women's Hostel : Rs. 10.00 crore
 - State Govt. for Indian History Congress : Rs. 2.00 crore
 - State & Central Govt. for Model Colleges : Rs. 16.00 crore
 - State Govt. has committed Rs. 100.00 crore for International Convention Center
- Organized a lecture series by Nobel Laureates.
- Publication of Quarterly Newsletter 'Vidyavarta' which highlights the events, seminars and happenings in the University and its affiliated colleges. A 'Yuva Diwas' is organized every year on 12th January. Organized a Memorial Lecture Series in the name of first Indian Vice-Chancellor of University of Mumbai, Justice Kashinath Trimbak Telang.
- Inclusive Innovation 2013, is an initiative undertaken by Hon. Chancellor of Universities in Maharashtra, organized by Maharashtra University of Health Sciences, University of Mumbai, and Shivaji University, 162 students from University of Mumbai have submitted the projects.
- Examination Reforms. Online exam forms and The Practical and Internal marks for third year B.A., B.Com., and B.Sc. for March 2013 were submitted by students and colleges. For ensuring security, CCTVs are being installed. Suggestion boxes have been placed to invite

all stakeholders. The answer books are with OMR and Bar Codes.

- Delivery of Question papers to colleges through an encrypted web-link. Password is communicated to Principal/ Chief Conductor one hour before the examination. The question papers are downloaded and printed in the presence of Chief Conductor and Joint Chief Conductor. Question Paper Packets are opened by the Chief Conductor in the presence of Joint Chief Conductor and two students appearing in the examination. The whole process is monitored centrally from the Examination House using Information Technology.
- The University has decentralized the CAP centers for T Y B.Com, Engineering, Law & B.Sc. (IT), to ensure speedy assessment. Moreover, need based CAP centers are created depending on the examinations. Answer books are barcoded.
- The degree Certificate as well as the mark sheets now has seven security features to prevent counterfeit. The results of the examinations are published online on the University website. In case, a student does not clear an examination, revaluation facility is being provided on the website to apply for revaluation.

Annexure 6

Centre Reports

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❧ **Introduction**

University of Mumbai has been granted the status of the University with the Potential for Excellence and has been approved a grant of Rs. 30 Crore. The final sanction for various virtual Centres was received on 14th July 2009 and the first meeting of the Centre Co-ordinators and the investigators was convened by the then Vice-Chancellor, Dr. Vijay Khole on 16th July 2009 and it was decided to implement the UPE Scheme from the same date. As per the recommendations of the UGC committee, the UPE Office was set up in the Department of Education, Maulana Abul Kalam Aazad Bhavan at Vidyanagari campus of the University. The UGC-committee has approved thirteen virtual centers and one more project of Building construction of International students' Hostel.

❧ **Objectives of the UPE Programme**

- ❖ To enhance and to enrich interdisciplinary research involving various departments with their expertise in their subjects. The research projects are undertaken to encourage quality research in the area of Basic as well as applied studies.
- ❖ To create courses of multidisciplinary nature that will add relevance and hence value to current system of education.
- ❖ To create and maintain an institutional repository of scholarly publications, acquired and generated within the University including faculty-publications. It will generate a large database in future. It also includes the digital preservation of Palm-leaf Manuscripts which is aimed at conserving and preserving our rich national Heritage. It also opens new avenues and vocation for the students.
- ❖ To provide scholarly assistance to face the new challenges of Technology or Technology designing and also the challenges posed by newly emerging areas in Industry and marketing especially with the traditional occupations. The same problem is also faced by the strudels of traditional courses and thus centers are also trying to make the courses relevant to the modern scenario
- ❖ To suggest improvements in educational practices, policies and procedure to bring in the reforms in University to create value-based systems. To investigate multi cultureless by

studying the attitudes of diverse groups and to recognize and respond to the mental health of diverse groups.

- ❖ To create the healthy atmosphere for peaceful co-existence on the society by exploring theological discourse through text-analysis.

The Centre-wise Academic Report for the period December 2009-June 2015

I Centres: Presently Operational

1. CENTRE FOR GREEN TECHNOLOGY

The University invited tenders for the construction of a building for the Centre at the Vidyanagari (Kalina) campus of the University as per the recommendation of the UGC Committee and the construction of the Building has started in June 2012 and likely to complete in nine months.

An MOU was signed between the University of Mumbai and ICT Mumbai for the joint venture of Centre for Green Technology on 2nd November 2010 as per the recommendations of UGC committee. As per the MOU, ten research fellowships were allocated to each institution.

☞ The highlights of the work carried out at the University of Mumbai:

The Departments of Chemistry, Physics, Life Sciences and Biotechnology of University of Mumbai are participating in the Green technology projects.

☞ Objectives: The objectives of the project are

- ☞ Green synthesis of bulk chemicals
- ☞ Synthesis of chiral compounds with specific properties
- ☞ Development of optical and electrochemical sensors
- ☞ Development of low cost non-noble metal catalysts for efficient hydrogen production for Fuel-cells
- ☞ Development of efficient visible light photocatalysts to degrade non-volatile organic solvents and industrial dyes in aquatic medium.
- ☞ Role of Mangrove Ecosystems and bamboo forests in Carbon Sequestration

❖ Details of the work done:

The investigations in the areas of synthesis of organic compounds including chiral molecules, liquid crystals, etc. with diverse properties have been carried out. The sensors have been developed for inorganic as well as organic species. A brief description of the work is given below:

1. Development of electrochemical sensors for inorganic and biologically important molecules:

- A new dimeric Cu (II) complex $[\text{Cu}(\mu\text{-2-hep})(\text{hep-H})]_2 \cdot 2\text{PF}_6$ (1) containing a bidentate (hep-H) 2-(2-hydroxyethyl) pyridine) ligand was synthesized and used as a modifier in the construction of a biomimetic sensor for determining phenols. The linear working range was 10^{-6} and 10^{-8} M for all four of the analytes with detection limits of 1.04×10^{-8} , 2.31×10^{-8} , 1.54×10^{-8} , and 0.86×10^{-8} M for phenol, resorcinol, hydroquinone, and catechol and the cosmetic samples were examined using this electrode.
- Potentiometric stripping analysis of bismuth on cryptand [2.2.1] and multiwalled carbon nanotubes modified carbon paste electrode was done in this paper. The modified electrode has linear range 5.55×10^{-8} to 9.79×10^{-11} M ($r = 0.9990$) and detection limit ($S/N=3$) of 3.17×10^{-11} M. The electrode showed properties like high sensitivity; very low detection limits and excellent reproducibility which was further used for the determination of bismuth in pharmaceutical formulations, human hair, sea water, urine and blood serum samples.
- Detection of Samarium was done by developing graphite electrode coated with the 7,16-Dibenzyl-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane-multiwalled carbon nanotube composite. In addition, FRA and AFM were used for observing the surface morphology. The potentiometric sensor mentioned above gives linear working range 1×10^{-2} – 1×10^{-8} M, Nernstian slope, 20.2 ± 0.48 mV per decade and detection limit, $6.3 \pm 0.36 \times 10^{-9}$ M.
- Carbon paste electrode modified with hexathia crown ether and rice husk was used for potentiometric stripping analysis of Antimony. The use of rice husk as a modifier in voltammetry has been achieved for the first time. The modified electrode shows 12-fold enhancement in the PSA signal over plain carbon paste electrode (PCPE). The linear working range and detection limit were found to be 1.42×10^{-8} to 6.89×10^{-11} M

($r = 0.9944$) and 2.11×10^{-11} M respectively. The pharmaceutical formulations, human hair, sea water, urine and blood serum samples were analyzed.

- A glassy carbon paste electrode modified with a Dowex50wx2 and gold nanoparticles was developed for individual and simultaneous determination of acetaminophen and tramadol. Techniques like cyclic voltammetry, chronocoulometry, electrochemical impedance spectroscopy and adsorptive stripping square wave voltammetry were used. The prepared modified electrode shows advantages like simple preparation, long-time stability and excellent reproducibility. The high sensitivity and selectivity of the chemically modified electrode was demonstrated by its practical application in the determination of both drugs in pharmaceutical formulations, urine and blood serum samples.
- Dibenzo-18-crown-6 modified carbon paste electrode was used for studying the electrochemical behavior of L-tryptophan. Various techniques like cyclic voltammetry, differential pulse voltammetry and electrochemical impedance spectroscopy were used for this purpose. The linear working range and detection limit obtained by this method were 1.96×10^{-6} to 1.01×10^{-3} M and 9.79×10^{-8} M respectively. The pharmaceutical as well as biological samples were analyzed using this modified carbon paste electrode.
- Individual and simultaneous determination of acetaminophen, aspirin and caffeine was carried out using carbon nanotube paste electrode modified in situ with Triton X 100. Cyclic voltammetry, electrochemical impedance spectroscopy, chronocoulometry and adsorptive stripping differential pulse voltammetry were the techniques employed for this purpose. The prepared modified electrode showed several advantages like simple preparation method, high sensitivity, very low detection limits and excellent reproducibility. Furthermore, the proposed method was applied for the simultaneous determination drugs in pharmaceutical formulations, urine and blood serum samples.
- The pH study of Fenitrothion was carried out using and maximum peak current is obtained at pH 4.5. Then, different buffers at pH 4.5 were prepared & their effect on the peak current was examined. The experimental data shows that B. R. buffer gives the best peak & thus was chosen for the further studies. Then, concentration of B. R. buffer (pH 4.5) was varied from 0.02-0.2M. The plot of Conc. v/s peak current reveals

that 0.12M B. R. buffer gives highest peak current. Different modified electrodes were prepared & their response on FTN was checked. Hydroxyapatite nanopowder modified carbon paste electrode gives the better response and so was used for the further analysis. In the future, the effect of scan rate, linearity, interference studies and application for this sensor.

- Nafion–carbon nanotube composite glassy carbon electrode was fabricated for the determination of venlafaxine and desvenlafaxine using Differential pulse adsorptive stripping voltammetry. Techniques such as cyclic voltammetry, chronocoulometry, electrochemical impedance spectroscopy, scanning electron microscopy were also used. Analysis of pharmaceutical formulations, urine and blood serum samples was done using the proposed method.

2. Development and Applications of New Chiral Azole

- Chiral chemistry involving enantioselective or diastereoselective processes are considered as ‘Green’ as they involve synthesis / utilization of only the desired stereoisomer and avoid production of unwanted stereoisomer/s. Stereodiscrimination processes involve diastereomeric interactions. Understanding of the forces operating in transition state complexes gives better control over outcome of any stereochemical event. Proximity of chiral unit and availability of several heteroatoms for binding interactions was predicted to give distinct diastereomeric interactions.
- Initially chiral molecular recognition studies were carried out with chiral esters of N-acetyl anthranillic acids. The chiral alcohols employed were 1-menthol and (-) endoborneol.
- The chiral molecular recognition processes were monitored with fluorescence and CD studies. Some interesting results were obtained with neutral amine molecules.
- Chiral bases are employed in many organo-catalyzed reactions such as Michael reaction, Aldol reactions, Baylis Hillman reaction etc. In view of this, we have synthesized chiral benzimidazoles incorporating 1, 2, 3-triazoles, by Click-chemistry protocol. Enantiomerically pure benzimidazole was employed to obtain triazole incorporated new benzimidazole molecule. Chiral bases involving minimum two nitrogen atoms with a spacer for better binding are considered to be ideal for Organo-

catalytic enantio-selective processes. The new benzimidazole molecule possesses ideal features for a potential chiral catalyst. The chiral applications are under study.

3. Isolation, characterization and Biological evaluation of Natural Components from Tulsi Plant (*Ocimum Sanctum*).

- The isolation and characterization of natural components from Tulsi (*Ocimum Sanctum*) have been carried out which are further studies for their effect on carbohydrate regulatory enzymes viz. glucoamylase and α -amylase invitro. The various extracts of Tulsi were subjected for phytochemical analysis and screened for their effects on glucosidases viz. glucoamylase and α -amylase. The extracts were further column chromatographed for isolation of active compound(s).
- We have carried out antimicrobial screening of the Garlic (*Allium Sativum*) extracts and their effects on glucoamylase in vitro. Pet ether and Chloroform extracts are found to be antimicrobial and inhibitors of glucoamylase where as Ethyl Acetate and Methanol extracts are activators of glucoamylase. Hence, we report Pet ether and Chloroform extracts of garlic as hypoglycemic agents in Diabetes type II and Ethyl Acetate and Methanol extracts may be used in Glycogen Storage Disease III (GSD III).
- Chloroform-Ethyl Acetate fraction of *Terminalia bellerica* fruit rind powder showed maximum antimicrobial activity. This fraction on further purification by column chromatography gave a single spot compound, which after characterisation was found to be Epigallocatechin gallate. Epigallo catechin gallate showed significant antimicrobial activity against *E.coli*, *B. subtilis* and *S. Aureus*. Epigallocatechin gallate inhibits 23.13 to 46.24 % activity of glucoamylase at very low concentrations, therefore may be used as hypoglycemic agent showing good agreement with the earlier literature.
- Acetone extracts of *Terminalia bellerica* fruit rind powdered was fractionated by column chromatogrophy. Chloroform-Ethyl Acetate fraction showed maximum antimicrobial activity. This fraction was further fractionated using silica gel *Terminalia bellerica* column chromatography. The fractions were studied for antimicrobial screening and effects on glucoamylase activity in vitro. The bioactive

guided fraction leads to isolation of Gallic acid. It shows the significant antimicrobial activity against *E. Coli*, *B. Subtilis* and *S. Aureus* and 30.70 % and 42.34% inhibition of glucoamylase invitro at very low concentration.

4. Synthesis and Properties of Light Emitting Polyfluorenes Containing Cyanine Dye Moiety

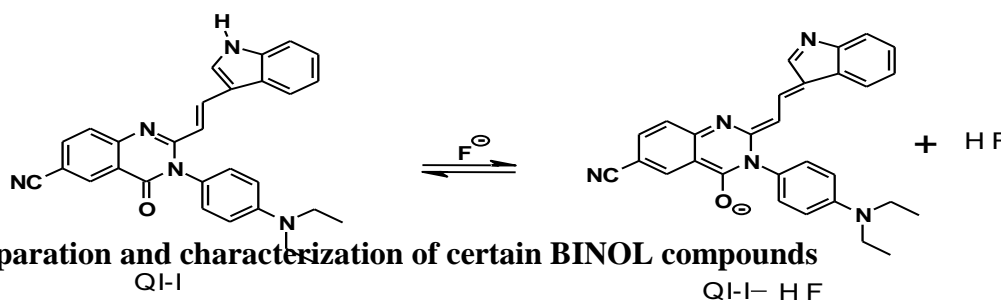
- The triphenyl amine substituted fluorenes are more stable to light and heat therefore it is decided to used as monomer in the main chain of polymer.
- Cyanines are charged polymethine dyes that benefit from high extinction coefficients and tunable absorption spectrum by varying the number of double bonds. Different from most small molecules, cyanines are easily processed from solution which makes them attractive for technological applications therefore used in the backbone of the polymer. The light emitting polymers of these monomers would be synthesized by polymerization reaction.
- Propose research work will led to develop new ways to make the synthetic methods more efficient and to minimize wastes while also ensuring that the chemicals used and generated by these methods are as nonhazardous as possible. The application of microwave dielectric heating during the synthesis of monomers will give the higher purity of final product and will avoid the side product formation.
- Recently we have synthesised, the monomer of cyanine dye containing benzothiazole is prepared by reaction with 2-Chloro formyl-3-hydroxymethylene-cyclohexane sodium acetate and salts of benzothiazole. In this process Bis salt of benzothiazole was prepared and then it was reacted with quaternary ammonium salt. These monomers will be used in synthesis of light emitting polymers.

5. Synthesis of novel internal charge transfer chemo sensors:

- Presently, we report the design and synthesis of a novel internal charge transfer chemosensor, **Q-1**, that signals the presence of fluoride via colorimetric as well as

ratiometric fluorescence modes. Addition of fluoride caused 112nm absorbance red shift with the probe's solution changing from yellow to red.

- The ^1H NMR revealed N-H deprotonation as well as upfield shifts of several CH signals due to the developing negative charge, post F^- addition. Jobs plot indicated 1:1 interaction and association constant; $\log K$ for F^- was determined to be 2.88. The detection limit of F^- , determined by fluorimetry is 6.7×10^{-6} M. We successfully synthesized following chemosensors for the detection of fluoride



6. Preparation and characterization of certain BINOL compounds

- Synthesis new BINOL with heteroaryl substituents at C-7, C-7' and C-8, C-8' positions. The retrosynthetic pathway is shown on the next page.
- At present, synthesis of [9,9']Bi[naphtho[1,2-d]isoxazolyl]-8,8'-diol has been achieved. The said compound is characterized by means of spectroscopic techniques such as IR, ^1H NMR and ^{13}C NMR.
- We are also working in modifying the synthetic protocol which will give us [9,9']Bi[naphtho[1,2-d]isoxazolyl]-8,8'-diol with good yield and with high purity.
- After this step the racemic BINOL derivative will be used for the resolution purpose and then for further applications such as HPLC analysis. The resolved molecule (BINOL) will be used for the construction of chiral crown ethers, chiral recognition study and asymmetric synthesis.

7. Development of low cost non-noble metal catalysts for efficient hydrogen production for Fuel-cells

- Various transition metals, namely Ni, Fe, Cu, Cr, Mo, and W, doped Co-B nanocatalyst were tested for H_2 generation by catalytic hydrolysis of sodium

borohydride. The promoting effect of these metal dopants were investigated as the function of treatment temperature. Tolerance against deactivation and self life of the alloy catalysts was also tested by recycling the catalyst several times.

- The catalytic performance of transition metal-doped Co-B ternary alloys was tested for H₂ generation by hydrolysis of Ammonia Borane. All transition metals induce significant promoting effects on the Co-B catalyst by increasing the H₂ generation rate by about 3-6 times as compared to the undoped catalyst.
- Catalyst in the form of Co-B nanoparticles supported on mesoporous silica particles (MSP) was synthesized by chemical impregnation–reduction method. MSP-supported Co-B catalyst was able to produce expected amount of H₂ gas from hydrolysis of AB with significantly superior generation rate, about 3 times higher than that produced by unsupported and NSP-supported Co-B catalyst.

8. Development of efficient visible light photocatalysts to degrade non-volatile organic solvents and industrial dyes in aquatic medium.

- V- and N-codoped TiO₂ photo-catalyst is synthesized by sol-gel method to sensitize TiO₂ to visible light. The concentrations of V and N were varied and optimized to enhance photo-catalytic activity. The photocatalytic activity for the degradation of Rhodamine B (an organic dye) under visible light irradiation obtained with co-doped TiO₂ photo-catalyst is 3 times better as compared to the undoped, V-doped, and N-doped TiO₂. The incorporation of V and N in TiO₂ lattice induces synergetic effects by forming isolated energy levels near the conduction and valence bands, respectively, causing an effective narrowing of the band gap.

✓ **List of Publications :**

1. A. K. Srivastava and R. R. Gaichore, “Macrocyclic Compounds Based Chemically Modified Electrodes for Voltammetric Determination of L-Tryptophan Using Electrocatalytic Oxidation”, **Anal. Lett.**, 43, 1933-1950 (2010).

2. S. M. Mobin, B. J. Sanghavi, A. K. Srivastava, P. Mathur and G. Lahiri, "Biomimetic Sensor for Certain Phenols Employing a Copper(II) Complex", **Anal. Chem.**, 82, 5983 - 5992 (2010).
3. S. M. Mobin, A. K. Srivastava, P. Mathur and G. Lahiri, "Single-crystal to single crystal transformations in discrete hydrated dimeric copper complexes", **Dalton Trans.**, 39, 1447 - 1449 (2010).
4. S. M. Mobin, A. K. Srivastava, P. Mathur and G. Lahiri "Reversible Single Crystal Transformations in a Hg (II) Derivative 1D –Polymer Chain ->2D Netorking as a Function of Temperature", **Dalton Trans**, 39, 8698-8705 (2010).
5. B. J. Sanghavi and A. K. Srivastava, "Simultaneous voltammetric determination of acetaminophen, aspirin and caffeine using an in situ surfactant-modified multiwalled carbon nanotube paste electrode", **Electrochim. Acta**, 55, 8638-8648 (2010).
6. N. S. Gadhari and B. J. Sanghavi, S. P. Karna and A. K. Srivastava, "Potentiometric stripping analysis of bismuth based on carbon paste electrode modified with cryptand [2.2.1] and multiwalled carbon nanotubes", **Electrochim. Acta**, 56, 627-635, (2010).
7. D. Paravatalu and A. K. Srivastava, "Proton medium effect based on ferrocene assumption in 80 Mass % Propylene Carbonate + p- Xylene Medium", **J. Solution Chem.**, 40, 403 (2011).
8. S. K. Agrahari and A. K. Srivastava," Graphite electrode coated with a 7, 16-dibenzyl-1, 4, 10, 13- tetraoxa-7, 16-diazacyclooctadecane multiwalled carbon nanotube composite as a sensor for detection of samarium", **Electroanalysis**, 23, 1531-1535 (2011).
9. B. J. Sanghavi and A. K. Srivastava, "Adsorptive stripping differential pulse voltammetric determination of Venlafaxine and Desvenlafaxine employing nafion - carbon nanotube composite glassy carbon electrode", **Electrochim. Acta**, 56, 4188-4196 (2011).
10. B. J. Sanghavi, N. S. Gadhari and A. K. Srivastava, "Potentiometric stripping analysis of antimony based on carbon paste electrode modified with hexathia crown ether and rice husk", **Anal. Chim. Acta**, 703, 31-40 (2011).
11. S. M. Mobin, A. K. Srivastava, P. Mathur and G. Lahiri, Varying structural motifs in oxyanions (NO_3^- , CO_3^{2-}) and phenoxyacetate (PhOAc^-) bridged coordination

- polymers derived from alkoxo-bridged dicopper building blocks with {Cu₂O₂} core, **RSC Advances**, 1 893–902 (2011).
12. B. J. Sanghavi, G. Hirsch, S. P. Karna and A. K. Srivastava, Potentiometric stripping analysis of methyl and ethyl parathion employing carbon nanoparticles and halloysite nanoclay modified carbon paste electrode, **Anal. Chim. Acta**, 735, 37– 45 (2012).
 13. Purvi B. Desai and A. K. Srivastava, Determination of amiloride at Nafion–CNT-nano-composite film sensor employing adsorptive stripping differential pulse voltammetry, **Sens. and Act. B**, 169, 341– 348 (2012).
 14. Reena R. Gaichore and A. K. Srivastava, Multiwalled carbon nanotube-4-tert-butyl calix[6]arene composite electrochemical sensor for clenbuterol hydrochloride determination by means of differential pulse adsorptive stripping voltammetry, **J. Appl. Electrochem.**, 42, 979–987 (2012).
 15. S.S. Patil and A. K. Srivastava, Development and Validation of Rapid Ion-pair RP-LC method for Simultaneous Determination of certain B-complex Vitamins along with Vitamin C, **J. AOAC INTERNATIONAL**, 95, 74 - 83 (2012).
 16. B. J. Sanghavi and A. K. Srivastava, Adsorptive stripping voltammetric determination of imipramine, trimipramine and desipramine employing titanium dioxide nanoparticles and amberlite XAD-2 modified glassy carbon paste electrode, **Analyst**, 138, 1395-1404 (2013).
 17. B. J. Sanghvi, S. M. Mobin, P. Mathur, G. K.Lahiri, A. K. Srivastava, Biomimetic sensor for certain catecholamines employing copper(II) complex and silver nanoparticle modified glassy carbon paste electrode, **Biosens. Bioelectron.**, 39, 124-32 (2013).
 18. A. K. Srivastava and R. Gaichore, Voltammetric determination of nifedipine using a β -cyclodextrin modified multi-walled carbon nanotube paste electrode, **Sens. and Act. B**, 188, 1328-1337 (2013).
 19. S. Patil and A. K. Srivastava , Development and validation of a liquid chromatography method for the simultaneous determination of eight water soluble vitamins in multivitamin formulations and human urine, **J. AOAC INTERNATIONAL**, 96, 1273-1280 (2013).

20. Purvi B. Desai and A. K. Srivastava, Adsorptive stripping differential pulse voltammetric determination of Metoprolol at Nafion-CNT-nano-composite film sensor. **Sens. and Act. B**, 176, 632-638 (2013).
21. A. K. Srivastava and R. Gaichore, Simultaneous determination of L-tyrosine and caffeine based on their electrocatalytic oxidation at 4-tert-butyl-calix[6]arene modified carbon paste electrode, **J. AOAC INTERNATIONAL**, 96, 133 - 141(2013).
22. S. K. Agrahari, S. D. Kumar and A. K. Srivastava, "Ion selective electrode for uranium based on composite multiwalled carbon nanotube-benzo-15-crown-5 in PVC matrix coated on graphite rod ", **J. Anal. Chem.**, 69, 40-49 (2014).
23. B. J. Sanghavi, P. K. Kalambate, S. P. Karna and A. K. Srivastava, Voltammetric determination of Sumatriptan based on a graphene/gold nanoparticles/Nafion composite modified glassy carbon electrode, **Talanta**, 120, 1-9 (2014)
24. Reena R. Gaichore and A. K. Srivastava, Electrocatalytic determination of propranolol hydrochloride at carbon paste electrode based on multiwalled carbon-nanotubes and γ -cyclodextrin, **J. Incl. Phenom Macrocycl Chem.**, 74, 195 - 206 (2014)
25. R. A. Dar, N. G. Khare, D. P. Kole, S. P. Karna, A. K. Srivastava, Green synthesis of a silver nanoparticle – graphene oxide composite and its application for As(III) detection **RSC Advances**, 4, 14432 (2014).
26. Nitin A. Mirgane, Sandip B. Kotwal and Anil V. Karnik, Ionic Liquid Promoted Diels-Alder Reaction Between Anthrone and Maleimides, **Cent. Eur. J. Chem.**, 8, 356-360, (2010).
27. Nitin A. Mirgane, Mohammed Hasan H. Akhtar and Anil V. Karnik, Chiral Ionic Liquid Mediated Diels-Alder Reaction Between Anthrone Enolate and Maleimides, **Letters in Org. Chem.**, 77, 343-347, (2010).
28. Nitin A. Mirgane and Anil V. Karnik, Aqueous ethanol: a suitable medium for the diastereoselective Diels-Alder reaction mediated by chiral bases, **Green Chemistry Letters and Reviews**, 1-4, (2011).
29. Nitin A. Mirgane and Anil V. Karnik, Asymmetric Diels–Alder Reaction Involving Chiral Benzimidazoles as Organocatalysts, **Chirality**, 23, 404-407 (2011).

30. Anita Pandey, Hasan Mohammed and Anil Karnik, Chiral benzimidazole-derived mono azacrowns: synthesis and enantiomer recognition studies with chiral amines and their ammonium salts, **Tetrahedron: Asymmetry**, 24, 706 – 712 (2013).
31. S. S. Raut, K. A. Barve, G. S. Bayes and V. R. Patil, Synthesis of Water-Soluble Polyesters Containing Carboxy-Functional Groups in the Polymers Chain and Study of Their Metal Complexes, **J. Inorg. Organomet. Polym. Mater.**, 20, 343–355 (2010).
32. Kamini J. Donde, Kanchan A. Barve, Sambhaji S. Raut, Vishwanath R. Patil, Stereochemistry and Antimicrobial Evaluation of Oxime Containing Compounds and their Indicator Property, **Int. J. Chem. Sci.**, 8(3),1440-1446 (2010).
33. Moiety, K. A. Barve, S. S. Raut, A. V. Mishra and V. R. Patil, Synthesis and Studies of Blue Light Emitting Polymers Containing Triphenylamine-Substituted Fluorene and Diphenylanthracene, **Journal of Applied Polymer Science** (2011).
34. Synthesis and Spectral Studies of 6, 13- di (p-hydroxyphenyl) pentacene and 6,13-di (p-hydroxynaphthyl) pentacene, Sambhaji Raut & Vishwanath Patil, **Polycyclic Aromatic Compounds**, 33,127–137(2013).
35. Meshram Gangadhar, Patil Bhavana, Shinde Datta and Metangale Ganesh, Effect of Epigallocatechin gallate isolated from Terminalia Bellerica fruit rind on glucoamylase activity in vitro, **Journal of Applied Pharmaceutical Science**, 01, 115-117 (2011).
36. Meshram Gangadhar, Patil Bhavana, Yadav Sunil, Shinde Datta, Isolation and Characterisation of Gallic acid from Terminalia Bellerica and its effect on Carbohydrate regulatory system in vitro; **International journal of research in Ayurveda and Pharmacy**; 2, 559-562 (2011).
37. Meshram Gangadhar, Shraddha Khamkar and Metangale Ganesh, Antimicrobial screening of Garlic (*Allium Sativum*) extracts and their effects on glucoamylase activity in-vitro, **Journal of Applied Pharmaceutical Science**, 02, 106-108 (2012).
38. R. Fernandes, N. Patel, A. Miotello, R. Jaiswal, D. C. Kothari, Stability, durability, and reusability studies on transition metal-doped Co–B alloy catalysts for hydrogen production, **International Journal of Hydrogen Energy**, 36, 13379-13391(2011).
39. R. Fernandes, N. Patel, A. Miotello, R. Jaiswal, D. C. Kothari, Dehydrogenation of Ammonia Borane with transition metal-doped Co-B alloy catalysts, **International Journal of Hydrogen Energy**, 37, 2397-2406 (2012).

40. N. Patel, R. Fernandes, R. Edla, N.B. Lihitkar, D. C. Kothari and A. Miotello, Superior hydrogen production rate by catalytic hydrolysis of ammonia borane using Co-B nanoparticles supported over mesoporous silica particles, **Catalysis Communications**, 23 39-42 (2012).
41. R. Jaiswal, N. Patel, D.C. Kothari, and A. Miotello, Improved visible light photocatalytic activity of TiO₂ co-doped with Vanadium and Nitrogen, **Applied Catalysis B: Environmental**, In press (2012).
42. N. Patel a, R. Fernandes ,S. Gupta ,R. Edla ,D.C. Kothari, A. Miotello, Co-B catalyst supported over mesoporous silica for hydrogen production by catalytic hydrolysis of Ammonia Borane: A study on influence of pore structure, **Applied Catalysis B: Environmental** 140-141, 125–132 (2013).
43. S. Gupta,N. Patel, R. Fernandes, D.C. Kothari, A. Miotello, Mesoporous CoeB nanocatalyst for efficient hydrogen production by hydrolysis of sodium borohydride, **International Journal of hydrogen energy**, 38, 14685-14692 (2013).
44. N. Patel a, R. Jaiswal, T.Warang, G. Scarduelli, Alpa Dashora,B.L. Ahuja, D.C.Kothari , A. Miotello, Efficient Photocatalytic degradation of organic water pollutants using V–N-codoped TiO₂ thin films, **Applied Catalysis B: Environmental** 150-151, 74-81 (2014).
45. N. Patel, R. Jaiswal, T. Warang, G. Scarduelli, Alpa Dashora, B.L. Ahuja, D.C. Kothari, A. Miotello, Efficient photocatalytic degradation of organic water pollutants using V–N-codoped TiO₂ thin films, **Applied Catalysis B: Environmental** 150–151, 74–81 (2014).
46. Gangadhar A. Meshram, Tanushri S. Kulkarni, Ganesh S. Metangale, Shraddha S. Khamkar, Biological evaluation of Garlic leaves extracts for carbohydrate Metabolism, *in vitro*, **World Journal of Pharmaceutical Research**, 3(5), 476-482 (2014).
47. Gangadhar A. Meshram, Shraddha S. Khamkar, Ganesh S. Metangale, Tanushri S. Kulkarni, Characterization of Campesterol, Stigmasterol and β -sitosterol from *Vinca rosea* leaves by GC-MS and Biological evaluation, **World Journal of Pharmaceutical Research**, 3(4), 2038-2042 (2014).

48. G.A. Meshram, S. S. Khamkar, Effect Of Oleanolic Acid Isolated From Garlic Leaves On Carbohydrate Metabolizing Enzymes, In Vitro, **International Journal of Pharma Sciences and Research**, 5 (12), 988-991 (2014).
49. R. Jaiswal, J.Bharambe, N. Patel, Alpa Dashora, D.C. Kothari, A. Miotello, Copper and Nitrogen co-doped TiO₂ photocatalyst with enhanced optical absorption and catalytic activity, **Applied Catalysis B: Environmental**, 168–169, 333–341 (2015).
50. N. Patel, Alpa Dashora, R. Jaiswal, R. Fernandes, M.Yadav, D.C. Kothari, B. L. Ahuja, A. Miotello, Theoretical and experimental investigations on the activity and stability of substitutional and interstitial boron in TiO₂ photocatalyst, **Journal of Physical Chemistry C**, Accepted (2015).
51. S. Gupta, N. Patel, D.C. Kothari and A. Miotello, Cobalt-Boride: An efficient and robust electrocatalyst for hydrogen evolution reaction, **Journal of Power Sources** 279 (2015) 620-625.
52. N. G. Khare, R. A. Dar, and A. K. Srivastava Adsorptive Stripping Voltammetry for Trace Determination of Quinalphos Employing Silicon Carbide Nanoparticles Modified Glassy Carbon Electrode, **Electroanalysis**, 27, 503 - 509 (2015).
53. Pramod K. Kalambate, Riyaz A. Dar, Shashi P. Karna and Ashwini K. Srivastava, High performance supercapacitor based on graphene-silver nanoparticles-polypyrrole nanocomposite coated on glassy carbon electrode, **J. Power Sources**, 276, 262 - 270 (2015).
54. Riyaz A Dar, Gowhar A Naikoo, Pramod K Kalambate, Lily Giri, Farid Khan, Shashi P Karna and Ashwini K Srivastava, Enhancement of the energy storage properties of supercapacitors using graphene nanosheets dispersed with macro-structured porous copper oxide, **Electrochim. Acta**, 163, 196 - 203 (2015).
55. Bankim J. Sanghavi, Nayan. S. Gadhari, Pramod K. Kalambate, Shashi P. Karna and Ashwini K. Srivastava, Potentiometric stripping analysis of arsenic using a graphene paste electrode modified with thiocrown ether and gold nanoparticles, **Microchimica Acta**, 182, 1473 - 1481 (2015).
56. Pramod K. Kalambate, Bankim J. Sanghavi, Shashi P. Karna and Ashwini K. Srivastava, Simultaneous voltammetric determination of paracetamol and domperidone based on a graphene/platinum nanoparticles/Nafion composite modified glassy carbon electrode, **Sens. and Act. B**, 213, 285-294 (2015).

57. Mal Phebe Kingsley, Purvi B. Desai and Ashwini K. Srivastava, Simultaneous electro-catalytic oxidative determination of Ascorbic acid and Folic acid using Fe₃O₄ nanoparticles modified carbon paste electrode, **J. Electroanal. Chem.**, 741, 71-79 (2015).
58. N. G. Khare, R. A. Dar, and A. K. Srivastava Determination of Carbendazim by Adsorptive stripping differential pulse voltammetry employing glassy carbon paste electrode modified with Graphene and Amberlite XAD 2 resin **Electroanalysis**, (Accepted) 2015.
59. Sterically Congested Chiral 7,8-Dioxa[6]helicene and Its Dihydro Analogues: Synthesis, Regioselective Functionalization, and Unexpected Domino Prins Reaction, Hasan, Mohammed; Pandey, Anita D.; Khose, Vaibhav N.; Mirgane, Nitin A.; Karnik, Anil V.* **European Journal of Organic Chemistry**, Accepted (2015).
60. A Convenient Route to Enantiomerically Enriched Furo-Fused BINOL Derivative” Sandeep Kotwal, Anita Pandey, Vaibhav Khose, Anil Karnik*, **Indian J Chem., Sec. B**, accepted (2015).
61. Size-Induced Chiral Discrimination Switching by (S)-(-)-2(a-hydroxyethyl)Benzimidazole-Derived Azacrowns” Anita D. Pandey, Hasan Mohammed, Raghuvir R. S. Pissurlenkar, and Anil V. Karnik* **Chem Plus Chem**, 80, 475–479 (2015).
62. New family of fluorogenic azacrown probes with identical cavity size but different electronic environment outside the macrocycle: effects on sensitivity of Cu²⁺ detection A. D. Pandey, Raghuvir R. S. Pissurlenkar, Anil V Karnik*, **Journal of Inclusion Phenomena and Macrocyclic Chemistry**, 81, 251-261 (2015).

Work at Institute of Chemical Technology

Green technology centre has completed three years since inception and several research scholars are working on the frontier areas of green chemistry and technology. The centre has also started unique new two year M.Tech. (Green Technology) course at Institute of

Chemical Technology. First batch of twenty students was passed out this year and many of them got good placement with various industries.

Several students are working in the different areas of like Catalysis, Surface Science and Kinetics etc. and have published their research in several reputed international journals. Prof. Yadav's group has made significant contributions on the preparation of solid acid catalysts, their characterization and application to develop several environment friendly reactions. This has reflected in his contributions of more than 60 publications in the reputed international journals and more than 30 patents. Various solid acid catalysts which can replace conventional corrosive acid based chemistry have been screened for the synthesis of 2-phenyl acetaldehyde from styrene oxide. Kinetic study of the synthesis along with effect of the different parameter has been studied for the same. **BMHF** (2, 5-bis hydroxymethyl furan) is important intermediate from drug chemistry point of view and has found immense application in crown ether and polymer. The efforts are taken to prepare BMHF using novel catalyst like sulfated zirconia. Glycerol is important renewable sources based organic compound and its acylation serve immense application in industry. Selective acylation of Glycerol is successfully carried out by MUI-CAT 5 catalyst. Hydrogenolysis of glycerol was done by heterogeneous catalyst to 1,2 propanediol. Similarly, etherification of glycerol with benzylic alcohol was kinetically studied. Mesoporous catalyst was developed by novel route and emphasis with their detailed characterization. Synthesis of nucleoside is challenging task and Nucleoside synthesis was carried out using multiple reactions and well studied by different spectroscopic techniques. Selective oxidation of aromatic alcohols to benzylic ketones was attempted by nanosize manganese oxide.

Prof. Yadav has also developed lipase catalyzed kinetic resolution of (\pm)-1-(1-naphthyl) ethanol under microwave irradiation. This is important contribution as lipases are easily available biodegradable catalysts and they can be used for kinetic resolution technique which has a significant potential in pharmaceutical industry for preparation of asymmetric drug molecules.

Ionic Liquids are versatile organic reagents and its acidity basicity study is key aspect to understand from reaction view point. Efforts were made to understand this aspect. Greener approach for synthesis of quinazolones via one pot component condensation in presence of catalytic amounts of sulfated tungstate. Immobilized lipases are important biocatalysis in green chemistry and transesterification using enzyme was carried out and its exclusive modeling was done. Homogenous catalysis have selectivity advantages over heterogeneous

catalyst. Vapor phase dehydration of glycerol to acrolein and its etherification was checked by homogenous catalyst. Iron catalyzed coupling reactions are current hot topic for research and iron catalyzed Sonogashira reaction protocol was done successfully. Heck reaction is having importance for developing different reaction substrates. Palladium catalyzed organic reaction was developed at ambient temperature and catalyst loadings.

Prof. Bhanage's group is working on homogeneous catalysis, catalyst-product separation techniques, synthesis of nanoparticles with greener methodologies and finding their catalytic applications. Nanosize catalyst its preparation and application have importance in green chemistry. Novel route for additive free synthesis of nanocrystalline zinc oxide was developed by microwaves, ultrasound and solar energy. As prepared nanosized zinc oxide was checked for propargylamines synthesis, α -aminophosphonate synthesis. Silver nanoparticles utilized for synthesis of enaminone and it offers several advantages over existing conventional protocol. New catalyst was developed for synthesis of direct amide formation from carboxylic acid and imine. Hypervalent iodine was utilized for carbodiimide synthesis.

Dr. Nagarkar's group has contributed in the area of surfactants and nanoparticles. Surfactant suitability for emulsification of vegetable oil is important aspect in emulsion study. A series of vegetable oils was studied for emulsification study.

Prof. Samant has developed several novel catalysts for multicomponent reactions. E.g. A multicomponent one-pot reaction of aromatic aldehyde, malononitrile, and nitromethane was carried out in the presence of solid bases like Mg-Al hydrotalcite, where 2-amino-5-nitro-4,6-diphenylcyclohex-1-ene-1,3,3-tricarbonitriles are obtained. They have also developed nitration of aromatic hydrocarbons and halobenzenes using NO_x catalyzed by solid acid catalysts. The use of nonconventional energy sources like microwaves and ultrasound for multicomponent reaction is also focus of his research.

Prof. Jayaram's group developed several heterogeneous catalysts for organic transformations. The work is focused on synthesis, characterization of heterogeneous catalysts and improving yield, selectivity, conversion of the reactions.

Prof. Bhagwat has contributed to the development of surfactants, interfacial science and novel ammonia based refrigeration systems. Prof. Gaikars group contributed towards separation science.

➔ The contributions were made in the various areas of green technology like

1. Development of alternative energy sources for organic reactions like microwaves, sonications etc
2. Development of novel methodologies for nanoparticles, novel materials with greener perspective
3. Development of novel, improved, selective catalysts for various reactions
4. Use of alternative solvents like supercritical carbon dioxide, ionic liquids, water, biodegradable solvents etc
5. Use of ionic liquids as a media, its functionalization and catalytic applications
6. Use of nanoparticles in organic reactions
7. Development of novel separation strategies
8. Development of solid acid and bases for organic reactions
9. Development of enzymes, its immobilization and its catalytic applications

➔ The output of the centre can be summarized as

1. New M.Tech (Green Technology) course dedicated to green chemistry and technology started. This is a first course in the country of this type. First batch of 16 students was passed out and many of them got good placement with various industries.
2. The faculties working under centre has published more than 275 papers in international and national journals of repute and more than 30 patents applied/obtained.
3. Several Ph.D. Students are working under this centre (list enclosed).

∞ List of Publications :

- 1) Singh, S.J., Jayaram, R.V., Oxidation of alkylaromatics to benzylic ketones using TBHP as an oxidant over LaMO_3 (M = Cr, Co, Fe, Mn, Ni) perovskites, **Catalysis Communications**, 10, 2004-2007, (2009)
- 2) Jain, S., Yamgar, R., Jayaram, R.V., Photolytic and photocatalytic degradation of atrazine in the presence of activated carbon, **Chemical Engineering Journal**, 148, 342-347 (2009).
- 3) Jain, S., Jayaram, R.V., Removal of fluoride from contaminated drinking water using unmodified and aluminium hydroxide impregnated blue lime stone waste, **Separation Science and Technology**, 44, 1436-1451(2009)
- 4) Patil, Y.P., Tambade, P.J., Parghi, K.D., Jayaram, R.V., Bhanage, B.M., Synthesis of quinazoline-2,4(1H,3H)-diones from carbon dioxide and 2-aminobenzonitriles using MgO/ZrO_2 as a solid base catalyst, **Catalysis Letters**, 133, 201-208 (2009)
- 5) Shrikhande, J.J., Hassan, P.A., Jayaram, R.V., Condensation reaction of benzaldehyde and acetone in o/w microemulsions: Effect of microemulsion compositions, **Colloids and Surfaces A: Physicochemical and Engineering Aspects**, 370, 64-71 (2010)
- 6) Parghi, K.D., Jayaram, R.V., Sequential oxidation and condensation of alcohols to benzimidazoles/ benzodiazepines by $\text{MoO}_3\text{-SiO}_2$ as a heterogeneous bifunctional catalyst, **Catalysis Communications**, 11, 1205-1210 (2010)
- 7) Jain, S., Jayaram, R.V., Removal of basic dyes from aqueous solution by low-cost adsorbent: Wood apple shell (*Feronia acidissima*) **Desalination**, 250, 921-927 (2010)
- 8) Parghi, K.D., Satam, J.R., Jayaram, R.V., Silica supported heteropolyacid catalyzed dehydration of aldoximes to nitriles and alcohols to alkenes, **Green Chemistry Letters and Reviews**, 4, 143-149 (2011)
- 9) Kumthekar, K.R., Nagarkar, J.M., Storage stable O/W emulsions of karanj (*Pongamia glabra*), Castor (*Ricinus communis* L.) and neem oil (*Azadirachta indica* A. Juss) for pesticide applications, **Pestology**, 35, 35-45 (2011)

- 10) Agawane, S.M., Nagarkar, J.M., Nano ceria catalyzed Ullmann type coupling reactions, **Tetrahedron Letters**, 52, 5220-5223 (2011)
- 11) Agawane, S.M., Nagarkar, J.M., Nano ceria catalyzed synthesis of α -aminophosphonates under ultrasonication, **Tetrahedron Letters**, 52, 3499-3504 (2011)
- 12) Nadkarni, S.V., Nagarkar, J.M., Synthesis of highly substituted indoles in presence of solid acid catalysts, **Green Chemistry Letters and Reviews**, 4, 121-126 (2011)
- 13) Singh, A.S., Bhanage, B.M., Nagarkar, J.M., Reductive carbonylation of aryl and heteroaryl iodides using Pd(acac)₂/dppm as an efficient catalyst, **Tetrahedron Letters**, 52, 2383-2386 (2011)
- 14) Gawande, M.B., Branco, P.S., Parghi, K., Shrikhande, J.J., Pandey, R.K., Ghumman, C.A.A., Bundaleski, N., Teodoro, O.M.N.D., Jayaram, R.V., Synthesis and characterization of versatile MgO-ZrO₂ mixed metal oxide nanoparticles and their applications, **Catalysis Science and Technology**, 1, 1653-1664 (2011)
- 15) Indulkar, U.U., Kale, S.R., Gawande, M.B., Jayaram, R.V., Ecofriendly and facile Nano ZnO catalyzed solvent-free enamination of 1,3-dicarbonyls, **Tetrahedron Letters**, 53, 3857-3860 (2012)
- 16) Kahandal, S.S., Kale, S.R., Disale, S.T., Jayaram, R.V., Sulphated yttria-zirconia as a regioselective catalyst system for the alcoholysis of epoxides, **Catalysis Science and Technology**, 2, 1493-1499 (2012)
- 17) Burange, A.S., Kale, S.R., Jayaram, R.V., Oxidation of alkyl aromatics to ketones by tert-butyl hydroperoxide on manganese dioxide catalyst, **Tetrahedron Letters**, 53, 2989-2992 (2012)
- 18) Gawande, M.B., Pandey, R.K., Jayaram, R.V., Role of mixed metal oxides in catalysis science - Versatile applications in organic synthesis, **Catalysis Science and Technology**, 2, 1113-1125 (2012)

- 19) Disale, S.T., Kale, S.R., Kahandal, S.S., Srinivasan, T.G., Jayaram, R. V., Choline chloride·2ZnCl₂ ionic liquid: An efficient and reusable catalyst for the solvent free Kabachnik-Fields reaction, **Tetrahedron Letters**, 53, 2277-2279 (2012)
- 20) Singh, S.J., Jayaram, R.V., Oxidation of alcohols to aldehydes and ketones using TBHP as an oxidant over LaMO₃ (M = Cr, Mn, Co, Ni, Fe) perovskites, **Synthetic Communications**, 42, 299-308 (2012)
- 21) Patil, U.B., Kumthekar, K.R., Nagarkar, J.M., A novel method for the synthesis of 5-substituted 1H-tetrazole from oxime and sodium azide, **Tetrahedron Letters**, 53, 3706-3709 (2012)
- 22) Agawane, S.M., Nagarkar, J.M., Synthesis of 5-substituted 1H-tetrazoles using a nano ZnO/Co₃O₄ catalyst, **Catalysis Science and Technology**, 2, 1324-1327 (2012)
- 23) Singh, A.S., Bhanage, B.M., Nagarkar, J.M., Formylation and acetylation of alcohols using Amberlyst-15® as a recyclable heterogeneous catalyst, **Green Chemistry Letters and Reviews**, 5 (2012).
- 24) Yadav, G.D., Yadav, A.R. Selective green synthesis of 1,5-benzodiazepine over modified heteropolyacid as nanocatalyst: Kinetics and mechanism, **Industrial and Engineering Chemistry Research**, 52 (50), 17812-17820. (2013)
- 25) Yadav, G.D., Yadav, A.R. Selective liquid phase oxidation of secondary alcohols into ketones by tert-butyl hydroperoxide on nano-fibrous Ag-OMS-2 catalyst, **Journal of Molecular Catalysis A: Chemical**, 380, 70-77. (2013)
- 26) Yadav, G.D., Surve, P.S. Solventless green synthesis of 4-O-aryloxy carbonates from aryl/alkyl-oxy propanediols and dimethyl carbonate over nano-crystalline alkali promoted alkaline earth metal oxides, **Catalysis Science and Technology**, 3 (10), 2668-2676. (2013)
- 27) Yadav, G.D., Surve, P.S. Regioselective ring opening reaction of epichlorohydrin with acetic acid to 3-chloro-2-hydroxypropyl acetate over cesium modified heteropolyacid on clay support, **Applied Catalysis A: General**, 468, 112-119. (2013).
- 28) Yadav, G.D., Kadam, A.A. Selective engineering using Mg-Al calcined hydrotalcite and microwave irradiation in mono-transesterification of diethyl malonate with cyclohexanol, **Chemical Engineering Journal**, 230, 547-557 (2013)

- 29) Yadav, G.D., Yadav, A.R. Selectivity engineered friedel-crafts acylation of guaiacol with vinyl acetate to acetovanillone over cesium-modified heteropolyacid supported on K-10 Clay, **Industrial and Engineering Chemistry Research**, 52 (31), 10627-10636 (2013)
- 30) Yadav, G.D., Sharma, R.V., Katole, S.O. Selective dehydration of glycerol to acrolein: Development of efficient and robust solid acid catalyst MUICaT-5, **Industrial and Engineering Chemistry Research**, 52 (30), 10133-10144. (2013).
- 31) Yadav, G.D., Fernandes, G.P. Selective synthesis of natural benzaldehyde by hydrolysis of cinnamaldehyde using novel hydrotalcite catalyst, **Catalysis Today**, 207, 162-169. (2013).
- 32) Yadav, G.D., Salunke, J.Y. Selectivity engineering of solid base catalyzed O-methylation of 2-naphthol with dimethyl carbonate to 2-methoxynaphthalene, **Catalysis Today**, 207, 180-190. (2013)
- 33) Yadav, G.D., Gawade, B.A. Novelty of combustion synthesized and functionalized solid superacid catalysts in selective isomerization of styrene oxide to 2-phenyl acetaldehyde, **Catalysis Today**, 207, 145-152. (2013)
- 34) Yadav, G.D., Surve, P.S. Atom economical green synthesis of chloromethyl-1,3-dioxolanes from epichlorohydrin using supported heteropolyacids, **Industrial and Engineering Chemistry Research**, 52 (18), 6129-6137 (2013)
- 35) Shah, M.R., Anantharaj, R., Banerjee, T., Yadav, G.D. Quaternary (liquid + liquid) equilibria for systems of imidazolium based ionic liquid + thiophene + pyridine + cyclohexane at 298.15 K: Experiments and quantum chemical predictions, **Journal of Chemical Thermodynamics**, 62, 142-150. (2013)
- 36) Yadav, G.D., Mewada, R.K. Novelty of azobenzene synthesis via selective hydrogenation of nitrobenzene over nano-fibrous Ag-OMS-2 - Mechanism and kinetics, **Chemical Engineering Journal**, 221, 500-511 (2013)
- 37) Yadav, G.D., Lawate, Y.S. Hydrogenation of styrene oxide to 2-phenyl ethanol over polyurea microencapsulated mono- and bimetallic nanocatalysts: Activity, selectivity, and kinetic modeling, **Industrial and Engineering Chemistry Research**, 52 (11), 4027-4039 (2013)

- 38) Manyar, H.G., Yang, B., Daly, H., Moor, H., Mcmonagle, S., Tao, Y., Yadav, G.D., Goguet, A., Hu, P., Hardacre, C. Selective Hydrogenation of α,β -Unsaturated Aldehydes and Ketones using Novel Manganese Oxide and Platinum Supported on Manganese Oxide Octahedral Molecular Sieves as Catalysts, **ChemCatChem**, 5 (2), 506-512. (2013).
- 39) Shah, M.R., Yadav, G.D. Prediction of sorption in polymers using quantum chemical calculations: Application to polymer membranes, **Journal of Membrane Science**, 427, 108-117 (2013)
- 40) Lanke, S.R., Bhanage, B.M. Nickel-catalyzed three-component coupling reaction of terminal alkynes, dihalomethane and amines to propargylamines **Applied Organometallic Chemistry**, 27 (12), 729-733 (2013)
- 41) Khan, S.R., Bhanage, B.M. Selective hydroaminomethylation of olefins using simple and efficient Rh-phosphinite complex catalyst **Applied Organometallic Chemistry**, 27 (12), 711-715 (2013)
- 42) Khan, S.R., Bhanage, B.M. Selective hydroformylation-acetalization of various olefins using simple and efficient Rh-phosphinite complex catalyst **Tetrahedron Letters**, 54 (45), 5998-6001 (2013)
- 43) More, G.V., Bhanage, B.M. Asymmetric ring opening of meso-epoxides with aromatic amines using (R)-(+)-BINOL-Sc(OTf)₃-NMM complex as an efficient catalyst **European Journal of Organic Chemistry**, (30), 6900-6906 (2013)
- 44) Badgujar, K.C., Dhake, K.P., Bhanage, B.M. Immobilization of Candida cylindracea lipase on poly lactic acid, polyvinyl alcohol and chitosan based ternary blend film: Characterization, activity, stability and its application for N-a **Process Biochemistry**, 48 (9), 1335-1347 (2013)
- 45) Patil, A.B., Bhanage, B.M. Solar energy assisted synthesis of palladium nanoplates and its application in 2-phenoxy-1,1'-biphenyls and N,N-dimethyl-[1,1'-biphenyl] derivatives synthesis **Journal of Molecular Catalysis A: Chemical**, 379, 30-37 (2013)

- 46) Qureshi, Z.S., Deshmukh, K.M., Bhanage, B.M. Applications of ionic liquids in organic synthesis and catalysis Clean, **Technologies and Environmental Policy**, 1-27. (2013) Article in Press.
- 47) Lanke, S.R., Bhanage, B.M. Amberlyst-15©: An efficient heterogeneous reusable catalyst for selective anti-Markovnikov addition of thiols to alkenes/alkynes and for thiolysis of epoxides, **Catalysis Communications**, 41, 29-33. (2013)
- 48) Gadge, S.T., Bhanage, B.M. Pd/C-catalyzed synthesis of oxamates by oxidative cross double carbonylation of amines and alcohols under Co-catalyst, base, dehydrating agent, and ligand-free conditions, **Journal of Organic Chemistry**, 78 (13), 6793-6797. (2013).
- 49) Patil, A.B., Bhanage, B.M. Solar energy assisted starch-stabilized palladium nanoparticles and their application in C-C coupling reactions, **Journal of Nanoscience and Nanotechnology**, 13 (7), 5061-5068 (2013)
- 50) Yadav, D.K.T., Bhanage, B.M. Copper-catalyzed synthesis of nitriles by aerobic oxidative reaction of alcohols and ammonium formate, **European Journal of Organic Chemistry**, (23), 5106-5110 (2013)
- 51) Khedkar, M.V., Sasaki, T., Bhanage, B.M. Efficient, recyclable and phosphine-free carbonylative Suzuki coupling reaction using immobilized palladium ion-containing ionic liquid: Synthesis of aryl ketones and heteroaryl ketones, **RSC Advances**, 3 (21), 7791-7797 (2013)
- 52) Patil, A.B., Bhanage, B.M. Novel and green approach for the nanocrystalline magnesium oxide synthesis and its catalytic performance in Claisen-Schmidt condensation, **Catalysis Communications**, 36, pp. 79-83. (2013).
- 53) Khedkar, M.V., Bhanage, B.M. Facile synthesis of isoindoline-1,3-diones by palladium-catalyzed carbonylative cyclization of o-bromobenzoic acid and primary amines, **Frontiers of Chemical Science and Engineering**, 7 (2), 226-232. (2013)
- 54) Khemnar, A.B., Sawant, D.N., Bhanage, B.M. Rhodium catalyzed cyanide-free cyanation of aryl halide by using formamide as a cyanide source **Tetrahedron Letters**, 54 (21), 2682-2684. (2013)

- 55) Khan, S.R., Bhanage, B.M. Selective hydroformylation of various olefins using diphosphinite ligands, **Applied Organometallic Chemistry**, 27 (5), 313-317. (2013)
- 56) Deshmukh, K.M., Madyal, R.S., Qureshi, Z.S., Gaikar, V.G., Bhanage, B.M. Experimental and theoretical investigations of consequence of ionic liquid anion on copper(I) catalyzed reaction of aryl iodide and thiols, **Industrial and Engineering Chemistry Research**, 52 (13), 4747-4757 (2013)
- 57) Gadge, S.T., Bhanage, B.M. Synthesis of α,β -alkynyl esters and unsymmetrical maleate esters catalyzed by Pd/C; An efficient phosphine-free catalytic system for oxidative alkoxy-carbonylation of terminal alkynes **Synlett**, 24 (8), art. no. ST-2013-D0181-L, 981-986. (2013).
- 58) Khedkar, M.V., Sasaki, T., Bhanage, B.M. Immobilized palladium metal-containing ionic liquid-catalyzed alkoxy-carbonylation, phenoxy-carbonylation, and aminocarbonylation reactions, **ACS Catalysis**, 3 (3), 287-293. (2013).
- 59) Wagh, Y.S., Tiwari, N.J., Bhanage, B.M. Metal-free synthesis of 2-aminobenzoxazoles using hypervalent iodine reagent, **Tetrahedron Letters**, 54 (10), 1290-1293. (2013).
- 60) Dhake, K.P., Karoyo, A.H., Mohamed, M.H., Wilson, L.D., Bhanage, B.M. Enzymatic activity studies of Pseudomonas cepacia lipase adsorbed onto copolymer supports containing β -cyclodextrin, **Journal of Molecular Catalysis B: Enzymatic**, 87, pp. 105-112. (2013) .
- 61) Dhake, K.P., Thakare, D.D., Bhanage, B.M. Lipase: A potential biocatalyst for the synthesis of valuable flavour and fragrance ester compounds, **Flavour and Fragrance Journal**, 28 (2), 71-83. (2013).
- 62) Bhatte, K.D., Bhanage, B.M. Synthesis of cobalt oxide nanowires using a glycerol thermal route, **Materials Letters**, 96, 60-62(2013)
- 63) Bhosale, M.A., Bhatte, K.D., Bhanage, B.M. A rapid, one pot microwave assisted synthesis of nanosize cuprous oxide, **Powder Technology**, 235, 516-519 (2013)
- 64) Kale, S.R., Kahandal, S.S., Gawande, M.B., Jayaram, R.V. Magnetically recyclable γ -Fe₂O₃-HAP nanoparticles for the cycloaddition reaction of alkynes, halides and azides in aqueous media, **RSC Advances**, 3 (22), 8184-8192. (2013).

- 65) Kale, S.R., Kahandal, S.S., Burange, A.S., Gawande, M.B., Jayaram, R.V. A benign synthesis of 2-amino-4H-chromene in aqueous medium using hydrotalcite (HT) as a heterogeneous base catalyst, **Catalysis Science and Technology**, 3 (8), 2050-2056 (2013).
- 66) Burange, A.S., Jayaram, R.V., Shukla, R., Tyagi, A.K. Oxidation of benzylic alcohols to carbonyls using tert-butyl hydroperoxide over pure phase nanocrystalline CeCrO₃, **Catalysis Communications**, 40, 27-31 (2013).
- 67) Parghi, K.D., Kale, S.R., Kahandal, S.S., Gawande, M.B., Jayaram, R.V. Sequential synthesis of β -amino alcohols using a CeO₂-ZrO₂ bifunctional catalyst system, **Catalysis Science and Technology**, 3 (5), 1308-1313 (2013)
- 68) Shendage, S.S., Singh, A.S., Nagarkar, J.M. Facile approach to the electrochemical synthesis of palladium-reduced graphene oxide and its application for Suzuki coupling reaction, **Tetrahedron Letters**, (2013). Article in Press.
- 69) Shelkar, R., Sarode, S., Nagarkar, J. Nano ceria catalyzed synthesis of substituted benzimidazole, benzothiazole, and benzoxazole in aqueous media (2013), **Tetrahedron Letters**, 54 (51), 6986-6990.
- 70) Singh, A.S., Shendage, S.S., Nagarkar, J.M. Palladium supported on zinc ferrite: An efficient catalyst for ligand free C-C and C-O cross coupling reactions, **Tetrahedron Letters**, 54 (47), 6319-6323 (2013)
- 71) Patil, U.B., Shendage, S.S., Nagarkar, J.M. One-pot synthesis of nitriles from aldehydes catalyzed by deep eutectic solvent, **Synthesis** (Germany), 45 (23), 3295-3299 (2013)
- 72) Shendage, S.S., Patil, U.B., Nagarkar, J.M. Electrochemical synthesis and characterization of palladium nanoparticles on nafion-graphene support and its application for Suzuki coupling reaction, **Tetrahedron Letters**, 54 (26), 3457-3461 (2013)
- 73) Singh, A.S., Patil, U.B., Nagarkar, J.M. Erratum: Palladium supported on zinc ferrite: A highly active, magnetically separable catalyst for ligand free Suzuki and Heck coupling (Catalysis Communications (2013) 35 (11-16)), **Catalysis Communications**, 36, 109-112. (2013)

- 74) Shendage, S.S., Patil, U.B., Nagarkar, J.M. Electrochemical deposition of highly dispersed palladium nanoparticles on Nafion-graphene film in presence of ferrous ions for ethanol electrooxidation, **Fuel Cells**, 13 (3), 364-370 (2013)
- 75) Patil, U.B., Singh, A.S., Nagarkar, J.M. Nanoceria-catalyzed highly efficient procedure for N-formylation of amines at room temperature under solvent-free conditions, **Chemistry Letters**, 42 (5), 524-526 (2013)
- 76) Singh, A.S., Patil, U.B., Nagarkar, J.M. Palladium supported on zinc ferrite: A highly active, magnetically separable catalyst for ligand free Suzuki and Heck coupling, **Catalysis Communications**, 35, 11-16. (2013)
- 77) Shelkar, R., Singh, A., Nagarkar, J. Amberlyst-15 catalyzed synthesis of 5-substituted 1-H-tetrazole via [3+2] cycloaddition of nitriles and sodium azide **Tetrahedron Letters**, 54 (1), pp. 106-109 (2013).
- 78) Bindwal, A.B., Vaidya, P.D. Kinetics of aqueous-phase hydrogenation of levoglucosan over Ru/C catalyst, **Industrial and Engineering Chemistry Research**, 52 (50), 17781-17789. (2013).
- 79) Sutar, P.N., Vaidya, P.D., Kenig, E.Y. Activated DEEA solutions for CO₂ capture-A study of equilibrium and kinetic characteristics **Chemical Engineering Science**, 100, pp. 234-241. (2013).
- 80) Vaidya, P.D., Dussa, V.S. Destruction of chlorinated organics by hydrotreatment using Ru/TiO₂ catalyst **Canadian Journal of Chemical Engineering**, 91 (4), 731-738. (2013).

2. CENTRE FOR COMPUTATIONAL SOCIAL SCIENCES

The Centre for Computational Social Sciences has undertaken following activities since its commencement in December 2009.

❖ Academic Year 2009-10

✓ Administration of experiments

- 1) Ultimatum game experiment in Ambivali, Karjat in January 2009 to study whether the gender discrimination leads to under-provision of community goods in tribal settlements. The experiment consisted of two different rounds. The sample size studied was 120 participants from the tribal village of Amboli in Karjat Taluka of Thane district.
- 2) Administration of dictator game experiment in University of Mumbai in December 2009 to understand pro-social preferences. The experiment consisted of five different rounds. It was a paper based experiment conducted with participants being drawn from Mumbai University students.
- 3) Digitalization of the Excavation report, Log Book and Antiquity Register of Inamgaon Site (Near Shirur, district Pune) by scanning and Photography, to preserve these old reports.
- 4) Data Entry from Antiquity Registers on Chalcolithic Site of Inamgaon after comparing already available literature on this subject.
- 5) Photocopying of Kulvritanta records from various archives in Maharashtra has started.

❖ Academic Year 2010-11

✓ Administration of experiments

1. Administration of coordination game in University of Mumbai in January 2010 to study whether coordination tendency among the sample chosen. Sample size was 15 students of department of economics. It was a paper based experiment.

2. Administration of dictator game in University of Mumbai in July 2010 to decompose the motivation of charity in “hard wired” source of altruism, altruism that is acquired from socialization and altruism that is result of social pressure. Sample size was 40 students of University of Mumbai with three rounds of experiment followed by psychological scale and demographic survey.
3. Setting up of a mobile experimental computer laboratory consisting 24 laptops and network setup along with Zurich Toolbox for Readymade Economic Experiments called z-tree in July 2010.
4. Organization of a technical lecture on Z-tree software. Dr.ShantanuMitra, lecturer at Jnan Chandra Ghosh Polytechnic, Kolkata was invited for the same.
5. Conducted a public good experiment using mobile computer lab & z-tree software in collaboration with Dr.ShantanuMitra, lecturer at Jnan Chandra Ghosh Polytechnic, Kolkata.The sample size studied was 18 with four rounds.
6. Secondary data collection on Chalcolithic Site of Inamgaon which are available in the form of antiquities and artifacts, articles, books and recent doctoral thesis at library and museum of Deccan college post Graduate and Research Institute, Pune.
7. Literature review from the data collected on the Inamgaon Site
8. Processing data according to the aim of getting desirable results like how the use of quantitative and statistical method on archaeological data give new insight on Chalcolithic culture of Inamgaon.
9. Photocopying of kulvritanta records from the archives of Bharat Itihas Sanshodhak Mandal in Pune in progress. 60 kulvritantas photocopied.
10. A four credit elective course on Experimental Economics, approved by the statutory bodies of the autonomous Department of Economics, University of Mumbai was offered as an elective for students in Masters in Arts (credit based) in Academic year 2009-11. It introduced experimental techniques, enabling students to test economic theory in the laboratory and in field. It covered important topics like auctions, market structures, voluntary- contribution mechanism from the point of view of experimental economics. Around 15 students successfully completed the course.

11. A four credit core course in Evolutionary Psychology has been instituted in the Department of Applied Psychology, University of Mumbai.

12. Three students working as project fellows registered for Ph.D in Experimental and computational social sciences.

❖ **Academic Year 2011-12**

✓ **Administration of experiments**

- 1) Administration of Trust game in University of Mumbai (Mumbai), Sardar Patel College of Engineering (Mumbai), Virmata Jijabai Technical Institute (Mumbai), Symbiosis Centre for Management and Human Resource Development (Pune) during July 2011-March 2012. Total sample covered was 72. It was conducted using mobile computer laboratory with the help of z-tree. The experiment consists of two rounds, followed by psychological scale & demographic survey.
- 2) Administration of Trust game in Virmata Jijabai Technical Institute (Mumbai), Symbiosis Centre for Management and Human Resource Development (Pune) during October 2011-March 2012. The sample size covered was 74. It was conducted using mobile computer laboratory with the help of z-tree. The experiment consists of two rounds, followed by psychological scale & demographic survey.
- 3) One more project fellow registered for Ph.D. in experimental social sciences.

❖ **Academic Year 2012-13**

- ❖ Experimental research : 13 experimental sessions were administered covering more than 195 respondents. Experiments conducted were public goods games, appropriation game and cheater detection
- ❖ Photocopying of kulvritanta records from the archives of Bharat Itihas Sanshodhak Mandal in Pune in progress. Till now, more than sixty kulvritantas have been photocopied and the process of digitization of data has been started. Seven data entry operators have been appointed for the same purpose.
- ❖ Five-day workshop on Econometrics Using R at Mata Vaishnavdevhi University, Jammu , Organized by the Indian Econometric Society, May 2013.
- ❖ Three-day workshop on Econometrics Using R jointly organized by Vijayanagara Sri KrishnaDevaRaya University, the Indian Econometric Society, August 2013
- ❖ One-day workshop on econometrics at Karnataka University during August 2013
- ❖ Three day workshop on data envelopment analysis conducted by Prof. Subhash Ray, University of Connecticut in Dec 2013

- ❖ Two-day workshop on Bayesian Econometrics conducted by Prof. Neeraj Hatekar, Dec 2013
- ❖ Workshops for college teachers on open source software R will be conducted in collaboration with Center for Advance Studies (CAS), Department of Economics, University of Mumbai during 21-30 August 2012

Academic Year 2013-14

1. Experiments conducted in Mahabaleshwar, Tetli in order to test some hypotheses about Elinor Ostrom's framework on conservation of common pool resources. The experiments consisted of a well known of the appropriation game from Ostrom (2006). Some flaws in the design were detected and hence a new version is planned in August.
2. Public goods, ultimatum and trust games conducted at Nagewadi, dist Satara. The objective is to test the role of caste groups in achieving coordination in solving collective problems. The results were interesting and the first draft of the paper is being written up.
3. An MoU has been signed with Messrs Maxus , a leading media research company to explore the possibilities of using insights from behavioural economics into managerial decision making and in particular into media planning. A set of six to eight video films is being planned to convey the basic ideas to the general audience. The scripts have been written and the production of the videos is being undertaken.
4. 12 interns from economics, psychology and computer science backgrounds have been appointed.
5. Work on developing an Indian language interface to the experimental economics software is in progress.
6. One four day workshop, one three day workshop, one 1 week workshop, and three one day workshops have been held from May to July. The workshops familiarised the participants with use of NSSO consumption expenditure data, use of basic statistical methods in social sciences, basic concepts in behavioural economics and evolutionary psychology and use of software for experimental research.

★ Publications ★

❖ Books

1. Neeraj Hatekar, 'Principles of Econometrics: An Introduction (using R)', SAGE India, 2010
2. Neeraj Hatekar (edt.) "Maratheeteel Don Abheejat Arthashastriya Poostke" (two original books on Economics written in Marathi), Lokvangmaya Griha, Mumbai.
3. Proposal under consideration by Routledge India on a book tentatively titled "Economic History of the Middle Class in Western India" by Neeraj Hatekar
4. Proposal under consideration in an advanced stage by SAGE India for a book on "Statistical Methods in Psychology" by Dr.Vivek Belhekar
5. Proposal under consideration for a teaching monograph on Maximum Likelihood Methods by the Indian Econometric Society, by Neeraj Hatekar

❖ Papers :

1. Hatekar N, A. Kumar and A. Sharma (2011) "Causality between Prices, Output and Money in India: An Empirical Investigation in the Frequency Domain", Journal of Policy Modeling [Elsevier], working papers series.
2. [Daniel Friedman](#), [Gautam Gupta](#), [Neeraj Hatekar](#), [Santanu Mitra](#), [Shyam Sunder](#), and [Sujoy Chakravarty](#)(2011) "Emergence of Experimental Economics", Economic & Political Weekly , August 27, vol XLVI
3. [Daniel Friedman](#), [Gautam Gupta](#), [Neeraj Hatekar](#), [Santanu Mitra](#), [Shyam Sunder](#), and [Sujoy Chakravarty](#)(2011) "Experiments on Individual Decision-Making", Economic & Political Weekly, August 27, vol XLVI p.47-53
4. [Daniel Friedman](#), [Gautam Gupta](#), [Neeraj Hatekar](#), [Santanu Mitra](#), [Shyam Sunder](#), and [SujoyChakravarty](#)(2011) "Experiments in Macroeconomics and Finance" Economic & Political Weekly, August 27, vol XLVI p.53-60

5. [Daniel Friedman](#), [Gautam Gupta](#), [Neeraj Hatekar](#), [Santanu Mitra](#), [Shyam Sunder](#), and [SujoyChakravarty](#),(2011) “Public Goods Experiments and Social Preferences” Economic & Political Weekly, August 27, vol XLVI p. 61-70
6. [Daniel Friedman](#), [Gautam Gupta](#), [Neeraj Hatekar](#), [Santanu Mitra](#), [Shyam Sunder](#), and [Sujoy Chakravarty](#)(2011) “Experiments in the Indian Context” Economic & Political Weekly, August 27, vol XLVI p.71-78
7. N. Hatekar, Savita Kulkarni and Ashutosh Sharma :”What Drives Inflation in India: Overheating or Input costs”, Economic and Political Weekly, August 20, 2011, vol XLVI.
8. Correa R. (2012) “Weak and Strong Time Consistency” Theoretical Economics Letters, vol.2, no.1, pp.79-82.
9. Correa R. (2012) “On the micro-macro continuum”, Journal of Economic Analysis, vol.3, no.1, pp.25-37
10. Correa R. (2012) “Berge-Bacharach-Schelling Play” Working Paper 38/1/2012, Department of Economics, University of Mumbai
11. Correa R. (2012) “On Marxian Exploitation”, American Review of Political Economy, vol 10 (1-2), pp 142-147
12. Correa R. (2012) “Berge-Bacharach-Schelling Play”, Working Paper 38/1/2012, Department of Economics, University of Mumbai
13. Hatekar N., Kulkarni S. and D’Souza R. (2012) “Experimental Investigation of Pro-social Preferences”, Working Paper Series UDE40/3/2012, Department of Economics, University of Mumbai
14. Correa R. (2013) “Rentiers and Workers-Capitalists in a non-classical model”, Journal of Mathematical Finance, special issue on Multi-Agent-Modelling in Finance, vol 3(3A), pp 11-14
15. Raju Swati and Neeraj Hatekar (2013): “Inequality, Income Distribution and Economic Growth in Maharashtra 2010-2010”, Economic and Political Weekly, September 2013.

16. Belhekar, V. M. (in press) 'Heuristics: Experimental investigation of Intelligence and Personality'. Journal of Psychological Researches.

❖ **Conferences organized/attended**

1. Organization of a two-day workshop on Experimental Social Sciences on December 28-29, 2009. It was multi-disciplinary workshop, involving 20 paper presentations by experts across globe in economics, experimental economics, psychology and philosophy. Prof. Shyam Sundar from Yale University gave the inaugural address.
2. A paper titled "Heuristics: Experimental investigation of Intelligence and Personality" was presented by Dr. V. M. Belhekar at the "Workshop on Experimental Social Sciences" organized by the Center on December 28-29, 2009.
3. A paper titled "Depression, anxiety and representativeness heuristics: Experimental study of base rate fallacy" was presented by Dr. V. M. Belhekar at the "Workshop on Experimental Social Sciences" organized by the Center on December 28-29, 2009.
4. Dr. Hatekar presented a paper (co-authored with Savita Kulkarni and Renita D'Souza) titled 'Decomposition of motive for charity with dictator game' was presented in international conference on experimental economics held at Jadavpur University, Kolkata on 27th December 2010.
5. Savita Kulkarni presented a paper titled 'Stereotypical Occupational Segregation & Gender Inequality: An Experimental Study' in three-day national seminar on 'Demographic Transition and Inclusive Development' (15-17 March 2012) at Indian Statistical Institute, Kolkata. It was jointly organized by International Institute for Population Studies. The paper was shortlisted for 'best paper award' in the conference.
6. Dr. Hatekar presented a paper (co-authored with Savita Kulkarni and Renita D'Souza) titled 'Experimental Investigation of Pro-Social Preferences' at the Conference on 'Experiments, Thought Experiments and Simulation' organized by the Department of Philosophy, Hyderabad Central University, Hyderabad, February 2010.
7. Dr. Kishore Gaikwad presented a paper titled 'Revisiting Inamgaon: Gauging Cultural Evolution through Technological tools' conference held by Society of South Asian

Archaeology Conference at University of Kelaniya Colombo Srilanka in August 2010.

8. Dr. Kishor Gaikwad presented a paper entitled, 'Technological Evolution, Transformations and Craftsmanship within the site of Inamgaon', International Association for Asian Heritage, First Biennial Conference, 7-8 April 2011, Colombo, Srilanka.

9. Dr. Kishor Gaikwad presented a paper entitled, 'Probing Gendered imageries: Evaluation of Human figurines at Inamgaon and Daimabad', Zahedan, Iran, Society of South Asian Archaeology, International Conference, 16-18 April, 2012

10. Savita Kulkarni (co-authored with Dr. Hatekar), presented paper titled 'Stereotypical Occupational Segregation & Gender Inequality : An Experimental Study' at following Conferences

a. 54th Annual Indian Society of Labour Economics Conference at Banaras in November 2012

b. 'workshop on Experimental Economics', Indian School of Business, Hyderabad in December 2012

c. 49th Annual Conference of the Indian Econometric Society, at Patna University during Jan 9th-11th, 2013

11. Parinaaz Mehta (co-authored with Dr. Hatekar and Savita Kulkarni), presented paper titled 'Culture, Community and Institutions: Voluntary Provision of Public Goods in Maharashtra' at 50th Annual Conference of the Indian Econometric Society, organized by the Indira Gandhi Institute for Development and Research between December 22-24, 2013

12. Dr. Hatekar conducted a two day pre-conference workshop on experimental methods in environmental economics with Prof. Gautam Gupta of Jadavpur University for the INSEE conference, jointly organized by INSEE and SANDEE, Tezpur Central University, Tezpur, Assam, December 2012

❖ Ph. D. Dissertations

The Centre has appointed following three project fellows who are pursuing Ph.D. in the field of experimental economics and statistics, along with academic and administrative work for the Centre. Various experiments and case studies are undertaken as part of their research. Their research is expected to complete in the forthcoming three years.

1. Ms. Savita Kulkarni (Project Fellow I): Title of the thesis is ‘Economics of Informal Institutions and Bargaining: An Experimental Game Theory Approach’ (Date of registration: December 16th 2009). Synopsis has been submitted.
2. Ms. Renita D’souza (Project Fellow II): Title of the thesis is ‘Hypothesis Testing in Economics: A Critical Approach’ (date of registration : 16th December 2011). Review of the literature pertaining to the topic of research is being undertaken.
3. Ms. Parinaaz Mehta (Project Fellow III): Title of the thesis is ‘Understanding Common Pool resources with reference to communal water resources: case studies from Maharashtra’, (date of registration : 16th November 2011).

3. CENTRE FOR MULTIDISCIPLINARY RESEARCH IN LANGUAGE AND LITERATURE

★ **This centre has undertaken two projects.**

- ✓ Project I- The Awakening-literature of Dalits
- ✓ Project II- Exploring Theological Discourse through Text-analysis for Peaceful Co-existence.

✓ ***Project I—The Awakening-literature of Dalits***

The Awakening-Literature of Dalits in India: work done under this component of the project is highlighted:

- ☞ Organised a two-day workshop on translating Dalit-sensibility. This was attended by representatives from Maharashtra, Gujarat and Uttar Pradesh. The eminent Scholars elaborated their creativity against their social background. Recommendations as well as responses of the Scholarly participants have been documented.
- ☞ 2 day National Seminar on “Dalit Literature – Various Aspects”- 14-15 November 2014.
- ☞ 2 day National workshop on “Globalisation in Dalit Literature” – 28-29 November 2014.

Dr. Madhav Pandit

- Presented a paper on ‘ Godhan me abhivyakta Dalit Chetana’ at a one day National Seminar ‘Gujrathi Dalit Sahitya’ at S. D. Arts and B. R. Commerce College, Gandhinagar on 22/3/13
- Presented a paper on ‘ Bhoomandalikarana aur Dalit Chetana’ at a two day National Seminar by Babuji Avhad Collge, Ahmadnagar on 26/4/2013
- Lecture on ‘ Bhakti sahitya mein vishwabandhutva ki bhavana (dalit sahitya ke sandarbh mein) on 23-24, Nov, 2014

- Lecture on Ikisvi sadi ke nataka: Kathya aur Shilpa (Dalit Sahitya ke sandarbh), Mahatma Phule Arts, Science and Commerce College, Panvel on 11th Jan, 2014
- Poetry presentation : Batvaraa organized by Gayatri Publication, Mumbai, 30/3/2013
- Poetry presentation: Pakhanda organized by 'Kutubnaama' Quarterly on 24-25 Oct, 2013

Dr. Ratilal Rohit

Book Published:

"PRAVARTAN" Anthology of critical articles published by Gujarati Dalit sahitya Academy, Ahmedabad, 2013

Research Article

1. "Revolt in Indian Medieval Literature: Special reference of saint Literature of Maharashtra" published in "Parivesh"(Quarterly, ISSN2319-1872), April-Jun, 2013, Page No. 81.
2. A critical study of a Play "AAGAGADI"by Chandravadan Mehta, Published in 'HAYATI' (Quarterly, ISSN 2231-0282) September-2013, p. 44.
3. A critical study of a Navel "VAJRAPRAHAR" by Kantilal Parmar, Published in 'BUDDHIPRAKASH' August -2013, p. 44
4. Research Article "MIL MAJADUR KI SAMASYA AUR GUJARATI DALIT SAHITYA, Published in "KING OF EDUCATION WORLD" Nov-Dece:2013, Issue 8, (ISSN 2278-9189) p. 10
5. Research Article "MANAVSAMVEDNANU UTTUNG SHIKHAR" published in 'HAYATI' (ISSN 2231-0282) December-2013, p. 42

CHAPTERS IN BOOK(S) :

1. "Nava Itihasnu Pagerun shodhati Kavita" Artical Published in "ZIBRA KROSING" (ISBN978- 93-81276-37-2) Gujarat Dalit Sahitya Academi,2013., p 79
2. A critical study on "**Gujarati Dalit literature**" Published in "**Counter cultural Discourse and 3. Dalit literature in India**" (ISBN 978-81-8376-441-4) Author: M. Dasan / Rajesh Karankal, 2014, ABD Publishers Jaipur (Rajasthan)

Presented papers: 5

Organised an International Seminar:

The University Department of Gujarati has organized Two-day International Seminar on "DALIT LITERATURE" on 5-6 December 2013.

AWARD:

"DALIT SAHITYA GAURAV AWARD- 2012" by Gujarati Dalit Sahitya Academy, Ahmedabad, on 25th January 2014.

✓ *Project II-- Exploring Theological Discourse through Text-analysis for Peaceful Co-existence.*

❖ **Dept of Sanskrit**

- ☞ Data Collection through primary texts
- ☞ Followed card system
- ☞ Data submitted to the Department of Philosophy for further Interpretation and analysis

★ **Primary Texts completed**

- ☞ Bhagavadgita
- ☞ Principal Upanishads
- ☞ Dnyaneshwari
- ☞ Yogavasishtha
- ☞ Tukarama-gatha

❖ **Completed the writings on-**

1. Discourse Analysis
2. Interfaith Dialogue on Ecology
3. Indian Philosophy- the master key to global harmony

4. Peace in *Bhagavadgita*
5. *Illustrations in Principal Upanishads*
6. *Need for Theological Discourse*
7. *Role of Scriptures for Peaceful Co-existence with stress on Upanishads, Bhagavadgita, Yogavasistha, Dnyaneshwari*

❖ **Dept of Arabic**

Completed Writings on the following topics and submitted to the Department of Philosophy for further Interpretation and Analysis

- ☞ What is Islam up to III.24.15 (Quran)
- ☞ A paper on Spirit and Matter
- ☞ Islam -a message of Peace

❖ **Dept of Philosophy**

- ☞ Interpretation of the primary data collected by Sanskrit Department in the context of Peace and Harmony is in progress.
- ☞ Interpretation of the data submitted by the Department of Arabic is in progress.
- ☞ Comparative study of the texts is being done.

★ **Complementary Activities:**

- ☞ Celebration of International Peace Day with 'Anam Prem'
- ☞ Peace talks are not confined to the scholars, Pandits and International leaders.
- ☞ Peace must come from within, from common man. .
- ☞ Representatives of Jainism, Buddhism, Hinduism, Christianity, and Islam sang devotional songs of their religions.
- ☞ The purpose behind such program was to initiate the feeling of harmony and peace in the masses.

☞ Round Table Conference under AAPAC :

Hosted a Round-table session with the title '**Interpreting the scriptures for strengthening harmony and peace.**' in the Afro Asian Philosophical Association Congress 2011(AAPAC)' which was held on 20-23 October 2010.

★ **Two Sessions:**

1. Interfaith Interreligious Dialogue: Dr. Kala Acharya, Director of Sommaiya Bharatiya Sanskriti Peetham, K. J. Somaiya College, Vidyavihar.
2. Interpretation of Scriptures for Peace and Harmony Prof Balasubramaniam, the Chairman of Indian Council of Philosophical Research.

❖ **Activities of Project Members:**

1. **Dr. Madhavi Narsalay** (Co-ordinator) delivered a lecture on the topic 'Communal Harmony' in Nirmala Niketan on 23rd November 2010 and 5th March, 2011 on Hinduism for Peaceful Co-existence as well as 21st March 2012 (Scheduled) for students of Social work who do community service.
2. Dr. Madhavi Narsalay was a respondent for two session a) Scriptural Hermeneutics b) Peaceful Coexistence for AAPAC
3. Dr. Madhavi Narsalay presented a paper on Living with Scriptures for Peaceful Co-existence:Why and How in a Symposium on Peaceful Co-existence organised by Focolare Movement, University of Mumbai and other institutes
4. Dr. Madhavi Narsale presented a paper on '**Concept of Water in Vedic texts**' in the International Seminar on 'The concept of Basic Elements in Religion, Philosophy and Literature' jointly organized by K. J. Somaiya Bharatiya Sanskriti Peetham and Navarra University, Spain (2013). Paper has been accepted for publication
5. She presented a paper on '**Peace Within and Peace Without through the Upanishads**' in the National Seminar on 'Global Ethics and Vedas' hosted by Karnataka University, Dharwad and Sandipani Veda Vidya Prathisthan, Ujjain (2013)

6. Paper entitled 'Matter & Spirit in Islam' was submitted by **Dr. Nooruddin Shaikh** for an International Seminar which was held in Bharatiya Sanskritipeetham of the K. J. Somaiya College, Vidyavihar, Mumbai on January 5th -8th January 2011
7. **Dr. Uma Vaidya** presented a paper on the subject ' Dialogue on Ecology in multi-religious scriptures' under the session of 'Interfaith Inter-religious Dialogue' of AAPAC
8. Dr. Uma Vaidya presented a paper on Spirituality and Global Peace in May, 2011 at Mount Abu.
9. Dr. Uma Vaidya presented a paper on Living with Scriptures for Peaceful Co-existence in a Symposium on Peaceful Co-existence organised by Focolare Movement, University of Mumbai and other institutes
10. The rational of the project is ready in about 70 pages which will be finalized with additions and omissions after getting the write ups from other investigators.
11. Comments on *Tukarama-gatha* will be added to the rational soon.
12. **Dr. Gauri Mahulikar** presented the paper entitled 'Scriptures- a master key towards Global Harmony' in the session Re-interpretation of the scriptures for social harmony and Peace of AAPAC.
13. Dr. Gauri Mahulikar presented a paper with the title Vedanta for Youth in a Symposium on Peaceful Co-existence organised by Focolare Movement, University of Mumbai and other institutes
14. She discussed resolution of Social Conflicts in a paper on Social Issues as reflected through the stories in the Upanishads at a seminar on Story Literature, University of Pune.
15. She presented a paper on '**The Concept of Air in Indian Philosophy**' in the International Seminar on 'The concept of Basic Elements in Religion, Philosophy and Literature' jointly organized by K. J. Somaiya Bharatiya Sanskriti Peetham

and Navarra University, Spain in February 2013. Paper has been accepted for publication.

16. She presented a paper on '**Nasadiyasuktavimarshanam**' in a National Seminar on Rigvedasuktavimarshanam organized by Delhi Sanskrit Academy and Vaidik Mission, Mumbai in March 2013.
17. **Dr. Shubhada Joshi** presented Papers on 'Knowledge Intellectual and Knowledge Spiritual –Indian Perspective' in 6th Biannual International Conference on Buddhist Meditation: Text, tradition and Practice.' at University of Mumbai.
18. She also spoke on 'Matter and Spirit in Indian Philosophy' in International Interfaith Dialogue Seminar at 'K. J. Somaiya Bharatiya Sanskriti Peetham'.
19. She wrote about 'Concept of personhood in Vedic Tradition' in Cologne seminar at University of Mumbai
20. She chaired a session in the International Seminar on The concept of Basic Elements in Religion, Philosophy and Literature' jointly organized by K. J. Somaiya Bharatiya Sanskriti Peetham and Navarra University, Spain in February 2013.
21. She chaired a session on Philosophy of Religion in the World Philosophy Congress at Athens held on from 4th -10th August, 2013
22. Yoga of Dnyaneshwari published in PHISPC Vol of Yoga ed. Prof. Satyaprakash Singh on 'History of Yoga', pp. 475-490 (2013)
23. **Dr. Meenal Katarnikar** delivered 20 lectures on 'Vedas and Upanishads' in St. Pious college
24. She also delivered 6 lectures on 'Medieval Saints in Maharashtra' at 'K. J. Somaiya Bharatiya Sanskriti Peetham'.
25. She also delivered a lecture on 'Matter and Spirit: A Jain Perspective' at University of Pune.

26. She also wrote a paper on 'Matter and Spirit: A western Perspective' at 'K. J. Somaiya Bharatiya Sanskriti Peetham'.
27. Chaired a session in the International Seminar on 'The concept of Basic Elements in Religion, Philosophy and Literature' jointly organized by K. J. Somaiya Bharatiya Sanskriti Peetham and Navarra University, Spain in February 2013.
28. Co-ordinated a Round-table on 'Relevance of Sramana Ethics in Contemporary Technocrat Society' and presented a theme note on 6th August 2013 at the World Philosophy Congress at Athens, Greece
29. Made a presentation in People's SAARC in 'International Interfaith Dialogue' organised by Observer Research Foundation on 9th Jan. 2014

❖ **Participation of all members:**

1. Attended the 'International Interfaith Dialogue seminar' arranged by K. J. Somaiya *Bharatiya Sanskriti Peetham* on 7th January 2010.
2. Attended Inter-faith dialogue meeting arranged by K. J. Somaiya *Bharatiya Sanskriti Peetham* on 10th February 2011.
3. International Symposium on 'Hindu-Christian Interfaith Dialogue' in collaboration with Focolare Movement from 12-16th Dec. 2011

Papers Presented & Activities 2013-15

Focolare Movement publication – Interpreting and living the scriptures for building universal harmony and peace

Participant Name	Paper Title
1. Dr. Madhavi Narsalay	Interpreting and living the scriptures for Building Universal Harmony and Peace: Why and How?
2. Prof. Dr. Shubhada Joshi	Scriptures for a Value-based Society
3. Dr. Meenal Katarnikar	Interpreting Religious Language
4. Dr. Uma Vaidya	The Message of Universal Brotherhood from Indian Scriptures With special reference to the Geeta and Jnaneshwari a well-known Marathi commentary on Geeta

5. Dr. Gauri Mahulikar “Vedānta for Modern Youth”

Focolare Movement publication – Castel Gandolfo inter faith Seminar – Rome (in the process of being published). The participants travelled to Italy by invitation.

1. Dr. Madhavi Narsalay The ‘different’ and the ‘opposite’: constraints in Interfaith dialogue
2. Dr. Meenal Katarnikar Significance of Interfaith Dialogue

Contemporary Relevance of Scriptures for Peaceful and Harmonious Co-existence – Seminar held in Dept. of Sanskrit – University of Mumbai (In process of publication)

1. Dr. Madhavi Narsalay Upanishads as pedagogical devices for peaceful co-existence
2. Dr. Gauri Mahulikar The Doctrine of *Svadharma* and *Yajna* in the Bhagavadgita
3. Dr. Meenal Katarnikar Role of Interfaith dialogue in Harmonious co-existence
4. Dr. Shubhada Joshi Some ponderings over Dnyaneshvari and its message for Peaceful and Harmonious co-existence

Other paper presentations

1. Dr. Madhavi Narsalay Dictionary of Hindu and Christian terms
- For Urbana University - Italy
2. Dr. Madhavi Narsalay Water in the Vedic Texts
- For Seminar on - The Concept of Basic Elements in Religion, Philosophy and Literature’ (Earth, Water, Fire, Air and Ether)
Organised by Sankruti Peetham, Mumbai and Navvara University Spain
3. Dr. Gauri Mahulikar Air in the Vedic Texts

Activities and visits

1. Chinmaya Mission Visit to Kolvan centre – discussions
2. Anam Prem Multi Religious Meet
3. Mysticism A two year diploma and advanced diploma course in Mysticism has been started with about 30-40 students participating so far
4. Dr. Gauri Mahulikar Conducting of Gita Varga-s

M.Phil and Phd thesis

1. Aarti Manjarekar Influence of Principal Upanishads on Jnanesvari
2. Deepak Chogle Influence of Principal Upanishads on Bhagavadgita

4. CENTRE FOR DIGITAL PRESERVATION OF PALM-LEAF MANUSCRIPTS

- The centre is progressing well as two project fellows have worked on 20 manuscripts so far out of 169 stored in the Fort Library of the University.
- The details about scribe's name, date, place, contents whether published, etc. are searched and a detailed report has been prepared and given below:

PLM	TITLE	SUBJECT	STATUS
36-A	Probably Anumitivāda	Nyāya	There is no information on the title of work, author, scribe, date and place is available. No publish work is found in library of Fort.
36-B	Siddhāntakalpavallī	Vedānta	The small ms of twelve folios is a simplified work on Siddhāntaleśasagraha of Appayyā Diksīta. The author is Sadāśivendra and the work of ms is assumed as in the close of 17 th to 19 th century. No publish work is found in library of Fort.
37	Naisadhīyacaritam	Mahākāvya	It is incomplete ms which contains only some part of fourth canto. No other information is available.
38	Collection of Hautraprayogas.	Prayogas	The prayogas such as Darśapurnamāsam, Maitravarunam, paśuhautram etc. No other information on ms is available. No publish work is found.
39			The ms is not documented as it is written in Telugu script. Will be dealt after completion of Grantha script mss.
40 A	No title is found		Ritual on Gāyatrimantra. No publish work is found.
PLM	TITLE	SUBJECT	STATUS
40 B	Sūtradīrghikā	Rituals	The ms contain the ritual on Agnyādheyam. It is authored by Bhattarudradatta. It has six and eight

			paala. No published work is found in library of Fort.
41	Rgvedapadapātha	Veda	The ms contain padapātha from 1 st Adhyāya to third Adhyaya and partly seventh and eighth Adhyaya of first Mandala. The colophon is not given.
42	Durūhaśiksā	Purvamimamsa	It is incomplete work on the treaty Duruhasiksa authored by Second (Chinna) Appayya Diksita. The published work has seven Tarangas but ms contain first two Tarangas. This ms is in most fragile condition. The name of scribe, place and date is not available.
43	--	--	This ms is not documented as the script is yet to identify.
44	Śabdakaustubha	Grammar	The work authored by Bhattoji Diksita is about the Vyākhyā on Astadhyayi of Panini. Ms contains second pāda of first Adhyaya and some part of the third pada. The scribe, place and date of ms is not given.
45	Āśvalāyana Grhyapariśishtam	Prayoga	Rituals on Śrāddha, Pinda, Pitryajña etc. The scribe is Dvivedi Subbarāya. No other information is available.
46	Somanathapranīta- mayūkhamālikā- vyākhyā	Purvamimamsa	The work is about a Vyākhyā -grantha on Śāstradīpikā- a treaty on Purvamimamsa. The ms is incomplete and no other information is available.
PLM	TITLE	SUBJECT	STATUS
47	Name not identified		Work in progress.
48	No specific title is given	Minor Upanisads, Stotras, Mantras, Pūjavidhis etc.	This ms has collection of around 77 such type of minor works on various subject matter.
49			The script of the ms yet to identify.
50	Aranyaka	Ritual	Only text, no commentary

52	Not known	Grammar	Ms is about some work on grammar but could not trace the subject matter as no information is provided for.
53	Aitareyanyakam	Veda	A complete text on Aranyakam. No other information about the scribe, place, date of ms etc. is available.
54	Rgvedapratishakhyam	Vedic Grammar	An incomplete work which has three to four parts. Some part has only text; some has text with commentary on particular portion from pratishakya.
55		Various Grhyasutra Prayogas.	Pasubandha, Darsapurnamasa, Agnihotra and Agnistoma etc.
56	Sulbapradipika		A commentary by Karvindasvami on Apastambasulbasutram is a complete work. The sutras are written in brief.
57	Rajadharmaparva of Mahabharata	Arsamahakavya	A complete work on Rajadharmaparva of Santiparva of Mahabharata.

Seminars and Workshops:

- Two days workshop on ‘Conservation and Preservation of Archival Materials and Manuscripts’ on 24-25 August 2010
- One day workshop on ‘Ink making and pigmentation’ conducted by Natwarlal Mehata 18th December 2010
- One day training programme on ‘Paleography’ was held on 3th August 2012
- Two days workshop on ‘Manuscriptology and Textual Criticism’ on 3rd and 4th September 2013.

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- (i) **Physical Stock of PLM -78**
- (ii) **Location - Mumbai University-Fort Library**
- (iii) **Type - Palm Leaf**

- (iv) **Script - Grantha, Telugu**
- (v) **Language - Sanskrit**
- (vi) **Subjects - *Vyakarna, Vedanta, Veda, Purana, Aitareya
Brahmana, Apstambiya Shulba Sutram, Various Prayogas.***
- (vii) **Source - Not Known**
- (viii) **Period of Mss - Approximately 17/18 century**

5. **DR. BABASAHEB AMBEDKAR CENTER FOR SOCIAL JUSTICE**

★ Project I

DIMENSION OF SOCIAL JUSTICE IN URBAN POVERTY: WORK, NETWORK & INCOME IN URBAN UNORGANISED SECTOR”

We have completed data collection work which was started from 15th November 2010 in the region of Mumbai. Collected data from Unorganized sector workers. We have filled the survey questionnaires in the area of Mumbai region like: Mankhurd, Govandi, Chembur, Ray Road, Kurla, Sion- Dharavi in part of Central railway and Borivali, Kandivali, Jogeshwari, Andheri, Bandra, Parel-Lalbaugh, Kolaba and Santacruz in parts of western Railways. Data Collection work has been completed by Students which are hired and coordinated by Project Fellow.

Now we are converting the data into soft copy for which data entry work is in process. The center envisaged creation of a longitudinal data base on employment, health, economic status of unorganized sector workers. We have finished one round of data collection on 1000 respondent households, which is being digitized and will soon be available for the academic community. The second round of data collection has begun. Analysis of the data collected has also started. The second round of data collection will end by September 2012. Subsequently, the data will be digitized and the third round of data collection will start.

★ Project II

Understanding Occupational Pursuits of Dalits in Maharashtra: Continuity and Change

As per the recommendation of UGC Experts project initiation workshop was held on 5th and 6th March 2010. Experts/Activists were invited to give inputs regarding how to conduct the project, five experts invited to prepare interview schedule on 10th, 11th, and 12th May, 2010. Workshop on Dharavi was conducted on 18th October, 2011.

Questionnaire prepared and data collection started for Charmakar and Dhors Communities.

Pilot study/interviews conducted for Charmakars and Dhors traditional leather workers and Tanners.

❖ Visited: Kolhapur from 3rd July to 9th July, 2010

Kale, Bajar Bhogav, Mahalar Peth, Savarde, Kanchan Wadi, Yelewade, Jhawara Nagar (Urban) Kolhapur(Urban)

❖ Visited: Solapur (District) from 15th to 22nd September, 2010

Pimpalner, Magalweda, Barshi, Varagad, Solapur City.

❖ Visited: Agra and Kanpur from 21st to 24th October, 2010

Agra-Mathura Road, Agra City

Kanpur- Unnav, Kanpur Central, Jajmoh, Shuklaganj, Tejbhag

❖ Visited: Kolkata from 06th to 10th January, 2011.

Bantala, Topshila, Phool Bhagan, Kausba, Bechulal Road, Sopan Mandal, Michael Nagar.

Next Field Visit to Chennai and Kolhapur for data Collection at the end of June, 2012.

In the month of August (Tentatively) Two Days National Seminar on “Dynamics of Dalit occupation in Maharashtra” to be conducted.

In Kolhapur and Solapur region we visited the above mentioned villages and were able to identify the problems of both the Charmakars and Dhors with regard to continuing their traditional occupations, some of the problems such as the issue of raw materials which is getting costlier, lack of adequate financial support from various State Corporations dealing with the occupation, lack of technological know how and training from the State Corporations, Problems of marketing, competition from the non traditional communities in taking over this occupations, disinterest of the new generation in accepting this occupations for several reasons. The role of gender is examined and it is observed that the contribution of women in enhancing income is significant.

Overall the situation of both the communities in the villages is pathetic and is on the verge that this would be the only generation who will carry this occupation. I also have a doubt that slowly the art of both the communities would be displaced and disappear because of the technological know how from the other communities and also because both the communities lack sufficient capital to compete in the present market economy and in a much larger context of globalisation were there are no buffers for these artisans communities.

The virtual centre is thinking of initiating a model which is in process has to how this artisans communities can be empowered in their occupations, what I suggest is a cluster approach through

Which certain groups can be clubbed together to form an associations which presently are lacking so that they can decide the pricing policy by taking the help of the virtual centre, in order

to compete in the market economy there is a need for new designing skill. Virtual centre in the end of the project will conduct a workshop where both the communities will be introduced to compete in the market and to get acquainted with the global designs and trade so that their product become acceptable in both national and international market. All this is possible if the Government at the level of State and Central have a strong commitment towards the artisan's communities. The virtual centre can act as facilitator in terms of providing knowledge about different aspects about technology and how it can be procured.

Visit to Agra, Kanpur and Kolkata was essential to know the functioning of the Tanneries, in Maharashtra both Charmakars and Dhors occupation is very much determined by the dynamics of the Tanneries located in the above regions. The supply of raw hides in Maharashtra is being reduced because most of these hides are being supplied to the tanneries in Kanpur, Agra and Kolkata. Most of the tanneries are owned by the Muslims in the above regions and it is they who decide the cost of raw materials. The supply of raw materials especially finished leather is being done from Kanpur, Agra and Kolkata and Chennai. The finished leather is also exported to the countries like UK, Europe, Canada and other regions across the globe. The tanneries well equipped with technology have good capacity for production, comparatively in Maharashtra the Dhors who are engaged in manual tanning find it difficult to compete with the finished leather coming from Kolkata, Chennai, Kanpur and Agra. The Dhors since they lack in technology /since they lack in capital are not able to withstand the pressure of the emerging market.

Some of the interviews which were conducted in the above regions have been documented and accordingly detailed interviews are mapped.

We have also made few videos of the field visits which explain the status of the Charmakars and Dhors Communities with regard to their work, wages, space, health financial assistance from various States/ Corporations. We have also collected the images of the field in different locations which reflect the occupational status of both the communities.

Special Achievements of the Centre:

Lecture Delivered:-

Dr. B. V .Bhosale, Project Co-ordinator was invited as Guest of Honour at the Council of Scientific & Industrial Research (CSIR) Foundation Day Celebration on 26th September,

2011 by Central Leather Research Institute, Chennai. He delivered a lecture to students on “Empowering leather artisans in Maharashtra”.

Documentary (in Marathi)

Final stage of Documentary on ‘Leather Artisans and Tanners in Maharashtra’.

Publication and Outcome

- B.V.Bhosale: Methodological Confusions and Challenges in Doing Field Work on Marginalized Communities in India, Golden Research Thoughts, Vol.I, Issue IV, Oct 2011, pp 34-37, ISSN No; 2231-5063
- B.V.Bhosale: ‘*Aasanghatit Charmyudyogache Sithyantare va Avhaney*’ in “Simantak Samuha : Savrup ani Samashya”, ABS Publication, Varanasi, 2014 , ISBN No: 978-93-81549-66-7
- Abodh Kumar and Neeraj Hatekar (2011): “Panwaalas in Mumbai :Property Rights,Social Capital and Informal Sector Livelihoods in Mumbai”, Economic and Political Weekly, Sept 2012

Monographs published in Marathi (by the Centre)

- “Dharavi: *Aasanghatit Charmyudyogache Sithyantare*”, March,2012
- “*Kolhapur: Paramparik Charmyudyog Eranivar*” March, 2012
- *Monograph* on Solapur (in Marathi), Dr. Babasaheb Ambedkar Centre for Social Justice, 2014 - “Solapur Jilyatil Charmaudyog : Aadhunik Tantratdnyanachi Aavhane” May, 2014
- Abodh Kumar, Kishore More and Neeraj Hatekar “Determinants of Supply of Labour for Informal Sector Women: The Case of Mumbai”, submitted for publication to the Indian Journal of Labour Economics
- Neeraj Hatekar and Kishore More: “Informal Sector and The New Middle Class in Mumbai”, forthcoming in “The Local Impact of Globalisation in South and South East Asia”, Routledge, edited by NielsBeerpoot and Bart Lambregts

Paper Presented at International / National Seminar :

- Paper Presented on “Occupational Pursuits Amongst Leather Artisans: A comparative Study in India and china” in ‘International Seminar for Young Scholars on Economic

Development Issues' on 11th September, 2012 organized by Chinese Academy of Social Science (CASS) and Graduate School at Beijing, Peoples Republic of China. (Sponsored by ICSSR).

- Abodh Kumar, Kishore More, Neeraj Hatekar “”Determinants of Supply of Labour for Informal Sector Women: The Case of Mumbai”, presented at the Indian Econometric Society meeting at Patna, January 2013.
- Neeraj Hatekar presented a paper “New Middle Class and the Informal Sector in Mumbai”, co-authored by Neeraj Hatekar and Kishor More at the Conference on Globalisation and Middle Classes, organised by the Kaastestart University and University of Netherlands, Bangkok, May 2013
- Abodh Kumar, Kishore More, Neeraj Hatekar “”Determinants of Supply of Labour for Informal Sector Women: The Case of Mumbai”, presented at the Conference on leading issues in Indian Economy, jointly organised by the Delhi School of Economics and The Indian Econometric Society, August 2013

Monographs in Marathi

- “Dharavi: Aasanghatit Charmyudyogache Sithyantare”
- “Kolhapur: Paramparik Charmyudyog Eranivar”

➤ Future plans:

1. The Centre needs two more years extension to prepare a concrete Report & transform the same in to a policy document.
2. The Centre can act as a facilitation centre between leather artisans & leather tanneries in Maharashtra with Central Leather Research Institute of Chennai and various Scheduled Caste Corporations, Nationalized Banks.
3. The Centre will create awareness about the different schemes, programs, initiated by the Government of Maharashtra i.e. Khadigram Udyog Aayog, Sant Rohidas Charmoudyog Ani Charmakar Vikas Mahamandal (LIDCOM), Mahatma Phule Magasvargiya Vikas Mahamandal, Samaj Kalyan Vibhag, and Nationalised Banks.
4. All the dissemination of knowledge will be done free of cost

5. The Centre intends to start a short- term training Programme for Developing Leather Technological Skills for the community which is being researched. This will be in collaboration with Central Leather Research Institute, Chennai. The same idea was shared by the Project Co-ordinator with the Director of the Central Leather Research Institute of Chennai. The Project Co-ordinator has also delivered some of the key ideas about the Centre and its future plan through a guest lecture which was delivered on 26th September, 2011. This was at the request of the Central Leather Research Institute Chennai.
6. The centre would also like to transform this project as a Centre for Leather Studies or Centre for Leather Technology. The exact nature of such centre would come into existence only when the centre receives some response from the UGC.
7. The centre would also be interested to start the leather skill development Programme. This would empower the community to build skills asset, the centre would also help the Artisans to identify market in Cities. The centre is vibrant in conducting the research activities, field work, publishing articles, monographs, to provide training with technological infrastructure, preparing documentaries, and conducting workshops, conferences , group discussions & seminars to understand various problems of leather artisans and empower them.

Impact of the project:

News report in Indian Express on dated: 12th January 2012, 02nd May, 2012.

The Project Coordinator and the Director of Central Leather Research Institute, Chennai shared a idea of Collaboration Programme of the Centre with Central Leather Research Institute on short- term training Programme for Developing Leather Technological Skills for the community which is being researched.

Interaction with Neeta Das, Deputy Director- Skill Development, Confederation of Indian Industry (CII),New Delhi to discuss on empowerment of artisans with S Ramadorai, former chief of IT Tata Consultancy Services, now an Advisor to Prime Minister on Skill Development.

News report in Indian Express on dated: 27th December 2012.

Review of Monographs on Kolhapur and Dharavi in Sammna newspaper titled ‘Kolhapur to Dharavi’ on 19th November, 2012

6. GROUP OF RESEARCH ON INDIAN DIASPORA (GRID)

The Group for Research on Indian Diaspora was set up with an aim to make an enduring contribution to the field of Indian Diaspora Studies. Project under GRID is titled “The Indian Diaspora in the Era of Globalization: Multiple Locations, Plural Identities and Privileged Exchange”. It is an interdisciplinary project that seeks to create and harness synergy on the study of the Indian Diaspora from the literary, sociological, economic, political and philosophical points of view. The GRID team consists of six Project Investigators including Coordinator, namely Prof Dr Dolly Sunny (Dept of Economics) and Members namely Prof Dr Nilufer Bharucha (Dept of English Literature), Prof. Dr Kamala Ganesh (Dept of Sociology), Prof Dr Mangala Sirdeshpande (Dept of French), Dr Kanchana Mahadevan (Dept of Philosophy) and Dr Renu Modi (Dept of African Studies). GRID is assisted by three Research Fellows. As per the directions of UGC-UPE team, the GRID researchers focus on areas related to study of Indian Diaspora in South Africa and Mauritius. The research of GRID also covers the thematic areas of Diasporic Indian Literature in English.

GRID web page has been created on the website of University of Mumbai. GRID has established contacts with like centres in India and abroad. During the course of three years ever since its initiation, GRID organised 12 public lectures and 4 seminars of eminent Indian and Foreign scholars in collaboration with various University Departments. The activities of GRID are given coverage by dailies like DNA, Hindu and Indian Express. The GRID members have undertaken several trips for data collection in Mumbai, 8 trips outside the state and 7 trips abroad, despite the fact that foreign trips are not funded by UGC or UPE but are being financed at individual capacity. The Members had been disseminating diasporic knowledge by chairing sessions, presenting papers, delivering special talks ,having been discussants in Conferences and presenting research findings in national /international conferences. The GRID members presented 33 papers in conference and delivered 23 talks, of which 29 were abroad though there is no provision made under this project to finance foreign trips. Members had to manage monetary sources with lot of difficulty since foreign trips and allied activities are very much essential for this project. The GRID members published 23 papers in international Journals/books with four forthcoming publications. GRID Researchers have a substantial collection of books under various disciplines of the project.

Two GRID Team members namely Dr Bharucha and Dr Ganesh won four Professional Awards. The GRID members attended several national and international conferences. Anthology of our work is getting ready for publication under the title “Issues of Identity & Exchange: Aspects of Indian Diaspora under Globalization.”

Members of teaching faculty of various post graduate departments, Ph.D and M.Phil scholars and Post graduate students had been beneficiaries of GRID activities.

Brief Report upto June 2015

PUBLICATIONS

- ◆ Papers in national and international refereed journals and anthologies

Total: 27 +forthcoming 5 = 32

- Books: (1 + forthcoming 1) = 2
- Anthology (Joint Publication by GRID) Forthcoming

Papers at conferences, special addresses = 53

Courses designed and taught: 7

Student research on topic of Diaspora guided by grid members: Total = 15

MPHIL AND PHD GUIDANCE

M.Phil Students

Supervisor	In progress	Completed
N. Bharucha	1	2
K. Mahadevan.	-	1
R. Modi	-	1
Total	1	4

Ph.D Students

Supervisor	In progress	Completed
D. Sunny	2	1
N. Bharucha	3	3
K. Ganesh	1	-
R. Modi	-	
Total	6	4

RESEARCH OUTPUTS

These include published books/papers/monographs/documentary film

Specific themes taken up by the Project Investigators include;

- **Literary and Cinematic texts**
- **Issues of Identity vis a vis Homeland and Hostland**
- **Comparative Religious and Linguistic Diasporic Identity**
- **Discourse of Cosmopolitanism**
- **Impact of Foreign Direct Investment on India**

Literary and Cinematic Texts

- Kanchana Mahadevan “*K.C. Bhattacharya and Spivak on Kant: Colonial and Postcolonial Perspectives, Lessons and Prospects*” in *Philosophy in Colonial India* ed. Sharad Deshpande **Springer and Indian Institute of Advanced Study**: New Delhi and Heidelberg, 2015
- Kanchana Mahadevan Joint author with Kamala Ganesh “*BeyondDiasporic Boundaries: New Masculinities in Global Bollywood*” in *SRK and Global Bollywood* ed. RajinderDudrah, Bernard Fuchs and ElkeMader. **Oxford University Press**: 2015 (forthcoming)
- Bharucha, Nilufer *Indian Diasporic Literature and Cinema*, Centre for Advanced Studies in India - **CASII Publications**, Bhuj, 2014.
- *The Contribution of the Indian Diaspora to the Changing Face of Europe: Literary and Cinematic Representations*, **SYNERGY** VOL. 10 / NO. 2 / 2014, Bucharest, Romania

- Bharucha, Nilufer '*Repossessing the Master Tongue, Subverting the Master Narrative and Challenging the Meta-narrative of History: Rohinton Mistry's Fiction*,' **Critical Practice**, 2010.
- Sirdeshpande, Mangala '*Francophone Literature in Mauritius*' in the **Proceedings of the 'Constructs of Home' Conference**, Kachchh University, 2011.
- Bharucha, Nilufer '*Negotiating Plural Identities and Multiple Locations in Diasporic Literature and Cinema*' in **Identity, Difference and Conflict: Postcolonial Critique**, eds. Victor Ferrao and James Ponniah, ACPI Bangalore.
- Ganesh, Kamala and Kanchana Mahadevan '*Beyond Diasporic Boundaries: New Masculinities in Global Bollywood*' in **SRK and Global Bollywood**, eds. Elke Mader and Rajinder Dudrah, OUP (forthcoming).

Issues of Identity in Homeland and Hostland

- Modi, Renu Book review of *Contemporary India and South Africa: Legacies, Identity and Dilemma* edited by Sujata Patel and Tina Uys, New Delhi and UK: Routledge, in **Economic and Political Weekly** 50 (16), 2015.
- Modi, Renu *Issue of Integration in Hostland: Africa and Indian Ocean*, epg-pathshala, **UGC inflibnet.ac.in** (forthcoming)
- Modi, Renu jointly with M. Mahalingham *Colonial period: Indentured Labour and Kangani system*, epg-pathshala **UGC inflibnet.ac.in** (forthcoming)
- Ganesh, Kamala 'Beyond historical origins: Negotiating Tamilness in South Africa', **Journal of Social Sciences** Vol. 25 Special issue edited by Anand Singh, Ravindra K Jain and Shobhita Jain, 2010, 25-37.
- Modi, Renu '*The Indian 'Birds of Passage' in South Africa: Renegotiating Identities in the Local and Global Context*' in **Indian Diaspora: Connecting and Engaging Generations Indian Identity**, World Focus, New Delhi, Special Issue 409, January, ISSN: 2230-8458, 2014, at <http://www.cnfworldfocus.org/index_files/409.htm>
- Modi, Renu '*Medical Tourism of Africans to India*, in **India in Africa: Changing Geographies of Power** (eds) Emma Mawdsley and Gerard McCain, Fahamu Books, Oxford, United Kingdom, 2011, pp.125-139.
- Modi, Renu '*Healthcare of Africans in India*' in **South-South Cooperation: Africa on the Centre Stage** (ed) Renu Modi, Palgrave Macmillan, United Kingdom, 2011, pp. 116-137.

- Modi, Renu ‘*Indian Communities in Africa*’ published in the special issue on Transnational Communities **Africa Insight**, Vol. 40 No 1, June 2010, Pretoria, South Africa, pp. 49-61.
- Modi, Renu, **Documentary Film: ‘Documenting Sidi History: Artistic Traditions and Community Initiatives’**, South-South Exchange Programme on the History of Development (funded by SEPHIS, Netherlands)(with producer Beheroze Shroff), 2011
- Bharucha, Nilufer ‘*Diasporic Constructs of Home in Literary and Cinematic Texts*’, **Proceedings of the ‘Constructs of Home’ Conference** Kachchh University 2011.
- Bharucha, Nilufer **Old and New Diasporic Writing**, (Book) Rawat Publications, Jaipur-Delhi (forthcoming)

Diasporic Identity along Religious and Linguistic Markers

- Ganesh, Kamala ‘*Tamils in Switzerland*’ (jointly with C. McDowell) in Peter Reeves, Rajesh Rai and Hema Kiruppalini (ed) **Encyclopedia of the Srilankan Diaspora**, National University Singapore: Editions Didier Millet., 2013, 137-144, .
- Ganesh, Kamala ‘*No Shri Ram in Lanka: Hinduism, Hindutva and Diasporic Tamils in Exile*’, published in Arvind Jamkhedkar, N.B. Patil and K. Sankaranarayanan (eds), **Journal of the Asiatic Society of Mumbai**, Vol. 85, 2013, 13-18.
- Ganesh, Kamala ‘*Diaspora, A Mirror to Indian Diversity? Caste, Brahmanism & the New Diaspora*’, in N. Jayaram (ed) **Diversities in the Indian Diaspora: Nature, Implications and Responses**, Oxford University Press, Delhi, 173 – 190,
- Ganesh, Kamala ‘*Language, Identity and Diaspora: Two Examples and an Insight*’ in Andrea Bogner, Vibha Surana, Manjiri Paranjpe and Meher Bhoot (ed) **Inszenierte Mehrsprachigkeit: Konzepte und Kontexte**. (Enacting Multilingualism: Concepts and Contexts) (Bilingual volume in German and English) Transcript Publishing House: Bielefeld (forthcoming), 2014.

Diasporic Foreign Direct Investment in India

- Dolly Sunny, *Impact of FDI on Domestic Investment In Six South Asian Countries: An Econometric Outlook*, (forthcoming), **South-Eastern Europe Journal of Economics (SEEJE)** (IIBA 2015 Special Issue), USA.
- Dolly Sunny, *FDI Inflows, Gross Domestic Product And Domestic Investment In India: An Appraisal In The South Asian Context With Panel Data Analysis*, (forthcoming), **The Journal of Developing Areas**, USA.

- Dolly Sunny, *Role of FDI Inflows in Spurting National Investment: Evidences from Panel Data Analysis* (forthcoming), **International Journal of Statistics and Economics** (ISSN: 0975-556X).
- Dolly Sunny with Ablin Joanes Carneiro-Alphonso, *Trends And Future Prospects Of Indian And Chinese Software Industry: Aspects Before Indo-China Diaspora*, (forthcoming), [Ecoforum](#) (IIBA 2015 Special Issue), USA
- Dolly Sunny, *What Do 30 Years of FDI Data Reveal To Us? - A Sneak-Peak into Startling Revelation Of An Indo-China Study*, **Area Studies: A Journal of International Studies and Analysis**. Vol. 11, No. 1, ISSN 0975-6035, Center for South East Asian and Pacific Studies (CSEAPS), January-June 2015.
- Dolly Sunny with Carneiro Alphonso Ablin, *Trends and Future Prospects of Indian and Chinese Software Industry: Aspects before Indo-China Diaspora*, **Journal of Business and Economics**, USA.
- Dolly Sunny, *FDI Inflows, Gross Domestic Product and Domestic Investment in India: An Appraisal in the South Asian Context with Panel Data Analysis*, (accepted for publication) “Indian economy in the South Asia” (ed.) **Wiley**, UK, forthcoming in December 2014, London, Professor Young-Chan Kim, University of Greenwich, London.
- Dolly Sunny with Aditi Sawant, “*Crowding-in and Crowding-out Impact of FDI on Domestic Investment: An Indo-China Analysis*”, , “**Global Journal of Economics**”, New Jersey/London/Singapore/Beijing, 2012.
- Dolly Sunny, ‘*FDI an Unsolved Riddle: Revelations of an Empirical Study in the Indian Scenario*’ **Journal of Administrative Reforms** GoI, Volume XLIV, No 2, July-September 2012.
- Dolly Sunny, ‘*Crowding-in and Crowding-out Impacts of FDI on Domestic Investment: The Case of India*’ (with Aditi Sawant) **International Journal of Knowledge Management and E-Learning**, Volume 3, No. 2, December 2011.
- Dolly Sunny, ‘*Crowding-in and Crowding-out Impacts of Foreign Direct Investment: A study of India’s Industrial Sector*’ (with Aditi Sawant) **Global Review of Business and Economic Research**, Volume 7, No. 2, December 2011.
- Dolly Sunny, ‘*South–South Cooperation: Towards a Triangular Relation in FDI with Africa*’, **Asian African Journal of Economics and Econometrics**, Volume 11, Number 1, January-June, 2011.

- Dolly Sunny, '*Promoting FDI Flows: The African Scenario Amidst Developing Countries*' in **The International Journal of Economic Issues**, Volume 2, Number 2, 2009.

EVENTS ORGANIZED BY GRID IN MUMBAI UNIVERSITY:

- International Conference '**Revisiting the 'Homeland' Link among Indian Diasporas**' organized by the Group for Research on Indian Diaspora (A UGC's UPE Project, University of Mumbai) (January 28, 2015)
- Talk by Prof. Mala Pandurang, BMN College Mumbai, on **Wives, Mothers and Others**, 8th August, 2014.
- Talk by Dr. Ned Bertz Professor Dept of History Hawaii University on **Nationalising Diaspora: the Gujaratis of Tanzania in 20th century Indian Ocean History**, July 1st, 2014.
- Talk by Professor Dr. Aparna Rayaprol, University of Hyderabad on **Issues on Indian Diaspora**, 1st February 2014.
- Lecture Series on Deepa Mehta's '**Elements Trilogy**' and **Bollywood/Hollywood** by Professor Dr. Sridhar Rajeswaran, Director, Centre for Advanced Studies in India-CASII, 5th February 2014.
- International Conference on **Hybrid Selves and Hyphenated Identities in Indo-Canadian Literature and Cinema**, February 2013.
- '**Imaging India from the Diaspora: Deepa Mehta's Elements Trilogy**', *Talk by Professor Sridhar Rajeswaran K.S.K.V. University of Kachchh and DAAD Visiting Professor Muenster University, Germany*, by Indo Canadian Studies Center (Funded By The British Columbia Province, Canada) and Group for Research on the Indian Diaspora (GRID) a centre established under University of Potential Excellence Centre held at ICSC Room, RanadeBhavan, Kalina Campus, and University of Mumbai 23rd and 24th January 2012.
- '**Indian Diaspora in South Africa: Current Issues**' *Talk by Nirmala Gopal, Department of Criminology, Kwa Zulu Natal University, Durban*, Organized by Group for Research on Indian Diaspora (GRID) at Dept of African Studies, December 2011.
- '**Current issues in Indian Diaspora Studies**' *Talk by Aprna Rayaprol, Professor Department of Sociology, Hyderabad Central University* for Group for Research on Indian Diaspora (GRID) at Dept of African Studies, 5th December 2011.
- GRID in collaboration with the Alliance Françoise Mumbai organized an interactive session with Ananda Devi noted francophone author from Mauritius entitled, '**Diasporic Lives and Literatures: In the Footsteps of the Women in My Novels**', March 14th 2011

- GRID in collaboration with Rajiv Gandhi Centre for Contemporary Studies organized a talk by Amb. J.C. Sharma Former Secretary, Ministry External Affairs Former Member Secretary, High Level Committee on Indian Diaspora. **Indian Diaspora: Implications for Foreign Policy, Security and Economic Development**, March 8th 2011.
- GRID organized a lecture by **Prof. Scott Lash** Professor of Sociology & Director, Centre for Cultural Studies Goldsmiths College, London University on **'New Globalizations, New Modernities'**, 8th February 2011
- GRID organized a talk by Lord Bhiku Parekh, Member House of the Lords and Professor Emeritus of Political Philosophy, Westminster University. The talk was entitled **'Construction and Constitution of the Indian Diaspora'**, 22nd January 2011
- GRID organized a symposium in honour of Cornelia Sorabji on the occasion of the release of the book *'Opening Doors: The Untold Story of Cornelia Sorabji'* by her nephew Prof. Richard Sorabji at the University of Mumbai's Convocation Hall, January 19, 2011
- GRID organized a talk by Prof. Akeel Bilgrami Johnsonian Professor of Philosophy and Director of the Heyman Center for the Humanities at Columbia University, New York. The talk entitled **'Gandhi and Modernity'** was in collaboration with the Rajiv Gandhi Centre for Contemporary Studies, University of Mumbai, 22nd Dec 2010.
- GRID organized a talk by Dr. Kavita Daiya Associate Professor, Department of English, The George Washington University, Washington, D.C. on **'The 1947 Partition, Gender and the Postcolonial Public Sphere in South Asian Literature'**, 20th Dec 2010
- GRID has organized a micro-symposium titled, **Imaginary Homelands: The Indian Diaspora in Literature, Philosophy, Cinema and Television**, in collaboration with the University Department of Communication and Journalism, 20th March 2010
- GRID organized a meeting with Professor Dhawan, Jr. Professor for Gender/Postcolonial Studies Goethe-University, Frankfurt, Germany, and Professor Varela from Professor for Gender & Queer Studies, Alice Salomon University, Berlin, Germany, **'Migration Politics and Govern mentality in Germany'**, 9th March 2010.

7. JAWAHARLAL NEHRU CENTRE FOR SOCIETY, SCIENCE AND TECHNOLOGY.

- ✓ **Title of the Project:** Establishment of medicinal plants based micro-enterprises through their conservation and sustainable utilization

- ✓ **Project Summary:**

The Project aims to promote local micro-enterprises for local value addition, income generation, reduce emigration to cities for jobs, to improve rural prosperity and sustainability. Thus, plants will not be endangered by ensuring sustainable harvest methods and organic cultivation practices. Such effort would also ensure quality of the herbal products consumed in the cities and ensure health and well being of the consumers. It is a 5 year project with 3 years over & nearly half of the planned progress is over as described below:

1.1. Work completed in brief:

- a) Staff training is done, experts are consulted on various aspects.
- b) Staff is now training the community.
- c) Baseline study of the people & resources is completed in 2 talukas- Alibag (Raigad district), Kudal (Sindhudurg district). Sindhudurg district is far away from market, farmers are unwilling to try this new option, so Alibag is found suitable to promote cultivation. Collection will be undertaken at both sites.
- d) Market study & linkage is ensured & a feasible business plan is prepared. Profitable products & development-marketing strategy is identified. Marketing intervention also includes backward linkage also- such as quality seeds/ planting material, appropriate tools that enhance productivity/ reduce cost etc.
- e) Training of the producers- farmers, gatherers is done. About 100 gatherers, especially the tribal & 50 farmers trained. Motivating people to work a big challenge here due to regular income from family members in jobs at Mumbai.
- f) Infrastructure development is nearly complete, at Alibag & Kudal. It comprises Work-shed with tin roof, iron poles, drying yard, weigh scale etc.. Land is leased/ rented as purchase is costly.

- g) Pictorial, local language manuals are prepared & used for training for the Collection, cultivation, processing activities. Vernacular training programs were not available before here. This is a major & novel project outcome.

1.2. Benefits:

The project is geared to generate regular & decent additional income of Rs. 2,500-5,000/- each per family to about 150 rural families in Alibag & Kudal talukas of Raigad & Sindhudurg district respectively. This could grow by 200-300% in 2-3 years after market hold is established & inventive products with low competition are developed. It would amount to Rs. 20 lakh additional income to the rural community annually & will meet the project investments in just 2-3 years!

2. The Project:

2.1. Rationale:

The Project aims to promote local micro-enterprises for local value addition, income generation, reduce emigration to cities for jobs, to improve rural prosperity and sustainability. Thus, plants will not be endangered by ensuring sustainable harvest methods and organic cultivation practices. Such effort would also ensure quality of the herbal products consumed in the cities and ensure health and well being of the consumers. Thus these criteria meet the “triple bottom line” of the corporate social responsibility (CSR)- ecology, equity and economy. This is needed for a sustainable society & all round human well being.

2.2. Objectives:

- Assurance of sustainable utilisation of local medicinal plants;
- Establishment of micro-enterprises and employment generation to local communities (there will be at least 20 beneficiaries per every village of intervention);
- Development of centralized Common Facility Centre (CFC) to support decentralised semi/ part-processors.

2.3. Deliverables

- Micro-enterprises and employment generation in the project villages
- Common Facility Centre (CFC) for semi-processing local herbs
- Linkage of the villages with other Schemes for sustained efforts.

3. Background of the Project:

3.1. Growth opportunity:

Herbal medicines demand is growing rapidly, in recent times. Medicinal plants meet the health needs of much population in developing countries, generating an industry valued at USD 14 billion globally with a potential to grow to USD 5 trillion by 2050. It generates income security for significant poor population in the developing countries. In India, the collection and processing of medicinal plants contributes to at least 35 million workdays of employment annually. The majority of them are collectors from the wild, few are traders. The gatherers are poorly paid as traders corner the profit & overharvest the resource to maximise the income in limited time. Cultivation is growing but amongst rich farmers rather than small or marginal ones. Processing facilities to add value are few & mainly urban, leaving the villages poor. Thus, poverty alleviation potential of this resource based by rural value addition is under-explored. Weak spread of even basic science & technology in the rural area is one of its reasons, and this project intends to promote such “prop-poor”, simple rural industrialisation. This has the spirit of “Gramodyog” that Gandhi ji professed & it will also revive the age old Ayurveda & allied traditional health practices that made India famous.

3.2. Nature conservation:

Promoting “pro-nature” science & technology is 2nd facet of this project as destructive methods & over-harvest has threatened medicinal plants e.g. Sarpagandha (*Rawolfia serpentina*), the wonder drug for hypertension. Their cultivation is yet to pick up due to lack of awareness, poor material, weak quality planting agri-technology development & no market ties. Cultivation of such high-value, profitable species will be promoted as additional income option for the farmers & employment opportunity for the landless labourers in the villages.

3.3. Equity:

Paddy cultivation is prevalent in the “Konkan” region i.e. coastal strip of Maharashtra state, where the project operates. It is unviable, loss-making due to poor price, high labour & other inputs cost & many income options to the villagers. Thus paddy farming causes rural distress & emigration, burdening the crowded cities further. Hon. Ex-president of India Prof. A. P. J. Abdul Kalam spoke of “PURA” development model, i.e., “providing

urban amenities in rural areas” for balance growth, to avoid the rural-urban disparity. The proposed project intervention can help to do so. About 40% of farm area is fallow- due to various reasons, so it can be tapped for herbal farming. This will not affect the food security of the village. Promoting organic cultivation techniques is also needed to guard consumers’ health from the hazards of the chemical inputs.

Appropriate technology- Scarcity, adulteration of the herbs due to scarcity, poor

TASK	STATUS	REMARK
a) Staff training	Orientation done, experts consulted	Staff is training the community now
b) Baseline study- people & resources	Completed in 2 Tehsils Alibag (Raigad district), Kudal (Sindhudurg district)	Sindhudurg is away from market, farmers unwilling, so Alibag suitable
c) Market study & linkage	Market survey completed, profitable products, strategy identified	Market includes backward linkage also- seed, tools
d) Training of the farmers, gatherers	About 100 gatherers, especially the tribal & 50 farmers trained	Motivating people to work a big challenge
e) Infrastructure development	Nearly complete, at Alibag & Kudal	Work shed with tin roof, iron poles, drying yard, weigh scale etc., land is leased/ rented
f) Training Manuals	Collection, cultivation, processing manuals ready	Vernacular training programs not available before!

knowledge amongst the stakeholders is the 3rd gap this projects aims to meet. It is a risk to the consumers health, so Good Manufacturing Practices (GMP) code requires quality monitoring at all levels- from farm to the table. But this is poorly done. So this project aims to generate quality production, processing & marketing methodology manuals & media programs for greater awareness in the society for improved human health & well being.

4. Highlights of the Work

4.1. Status of various Tasks completed:

The status of various tasks completed/ initiated is as below:

4.2. Benefits:

The project is geared to generate regular & decent additional income of Rs. 2,500-5,000/- each per family to about 150 rural families in Alibag & Kudal talukas of Raigad & Sindhudurg district respectively. This could grow by 200-300% in 2-3 years after market hold is established & inventive products with low competition are developed. It would amount to Rs. 20 lakh additional income to the rural community annually & will meet the project investments in just 2-3 years!

4.3. Constraints

- ✓ Late fund release & start was constraint that is now overcome.
- ✓ Poor motivation among the villagers due to regular income by money orders from the family members at Mumbai is a huge barrier to motivate villagers for any work.
- ✓ High labour cost & land rent or other cost due to the impact of Mumbai city close by are other dampeners.
- ✓ We managed to overcome or reduce the negative impact of such deterrents by constant persuasion, cheer-stories & tapping local opinion makers to enthuse the youth, besides the farming community/ the tribal.

4.4. Golden Principles:

Following thumb-rules or “golden” principles are adopted for acceptance-

1. No diversion of farmland to cash crops
2. Inputs, marketing cost from project
3. Labour contribution of the community
4. Income as members’ benefit
5. To showcase others this year’s success to upscale it next year
6. Producer company/ small scale industry registration planned for marketing, growth, long term sustainable institution.

5. Important accomplishments:

- ✓ No such project exists in entire Konkan, even by Dapoli or other Agriculture

Universities! Medicinal plants board has provided many projects across the state listed on its website, but none of this scale & strong market tie-up. Many self help group activities end up in producing incense sticks or candle etc. that the poor women are unable to sell & suffer in loss. This is avoided in this project by strong market study & linkage at the start, rather than later.

- ✓ Fallow/ waste land/ inter-cropping strategy is used so no threat to food security is imposed. There is no displacement of food crops for cash crops. Moreover, fallow land due to lack of irrigation/ poor soil/ slope etc. or blanks in the tree plantations/ orchards (Coconut etc.) or farm bunds are used. This has maximized biological productivity & income per unit area.
- ✓ The added farm/ forest product income is a boon to the loss making farming in this lateritic hill tract with red, acidic soils. It is infamous as unsuitable for cultivation compared to the black cotton soils in the eastern, rain shadow plains of the Western Ghats mountains. This is avoided by selecting crop suitable for the agro-climate.
- ✓ Kitchen Health Garden (KHG) training planned for primary health improvement. This includes growing & training if using simple garden plants like Tulsi (Holy basil), Haldi (Turmeric) etc. for home remedies to reduce or prevent or quickly cure the damage from the common ailments like cold, cough, fever etc. This is proven to be useful by NGOs such as Rural Communes near Sanjay Gandhi National Park (SGNP), Borivali.
- ✓ Research on propagation techniques of rare, valuable species like Nagkesar (*Mesua ferrea*) is initiated, which is unique. For, the farmers & experts in the project team have knowledge of horticulture techniques such as grafting, budding, layering etc., the resource is rare & valuable & can be re-grown using stock of the common local plants. This will enable its rapid multiplication. This will help resource conservation, eco-restoration & income generation simultaneously.

5.1. Action plan 2012-13:

- ✓ *Collection of about five to six species of wild medicinal plants from forests/ waste lands (see Annexure 1) by about 100 gatherers in the 2 clusters & viable sales to industries at Mumbai.*

- ✓ *Cultivation of five to six* species by about 50 farmers at Alibag & sales as above.
- ✓ Develop further & make functional the micro-enterprise at Alibag.
- ✓ Collaboration with Konkan Krishi Vidyapeeth (Agriculture University), Dapoli on key species like Nagkesar (*Mesua ferrea*) to conserve them & avail the rare resource from alternative options.
- ✓ Cultivation manuals, media kits, project success stories, lessons learnt etc. to be publicized through media, agri-extension agencies like Agri-college/ university
- ✓ Linkage to medicinal plants board, NABARD, horticulture mission & the corporate such as the Dabur & Himalaya Drug company to be strengthened & formalized for long term, sustained efforts even after the project period.

❖ **The work done at ICT Mumbai:**

➤ **Title of project: Development of solar collector system for steam generation for use in absorption refrigeration**

1. Objectives:

The objectives of the project are

1. To generate steam of about 130 degrees Celsius using CPC/ PTC. This steam can be used in ammonia absorption refrigeration system. The refrigeration effect produced can be used for cold storages or air conditioning.
2. To find our optimal design of PTC system for producing high pressure steam (~ 10 atmospheres) for power generation.
3. Development of automatic tracking mechanism (hardware) along with required software for tracking, so as to enable continuous tracking of the Sun and by the solar collector to receive maximum possible solar radiation at the highest possible strike angle for PTC system.

4. Cost reduction through improved materials, innovative geometries and modular designs.

2. Details of the work done:

Various types of reflectors were fabricated with variable geometries and tested experimentally for their collection and thermal efficiencies. For this, following step-wise procedure was followed.

1. Fabrication of CPC system of various geometric configurations and their thermal testing;
2. Fabrication of PTC systems with continuous tracking mechanism and their thermal testing;
3. Development of a mathematical model correlating geometry, and thermal efficiency.
4. Development of cost competitive design of CPC modules;
5. The steam generated by CPC modules was supplied to the absorption refrigeration unit and its performance was tested.

3. Impact of the UPE Programme:

The combination of solar energy with absorption cooling technology will lead to solar operated cold storage for perishable food products in rural India. A major portion of the total energy used by industry (45-65%) is used for direct thermal applications in the preparation and treatment of goods, as Industrial Process Heat (IPH). 37.2 % out of the total IPH demand, is utilized in the temperature range of 92-204°C. The largest share of the total IPH demand is currently met by steam, which can be achieved by proposed technology. Currently, electricity is utilized to produce steam, implementation of proposed technology bring down electricity consumption. This way we can reduce the load shedding problems in rural areas.

★ TITLE: DEVELOPMENT OF SOLAR COLLECTOR SYSTEM FOR STEAM GENERATION FOR USE IN REFRIGERATION:

The aim of the project is to develop CPC/PTC solar system for steam generation at lower cost. The steam thus generated using solar energy can be utilized for absorption refrigeration cycle. To achieve this, it is necessary to optimize design of PTC and CPC systems to get desired quality and quantity of steam. In the past one year, following work has been carried out:

1. 94.6 m² CPC System

CPC system with two glass tube on receiver pipe, Thermal efficiency is determined of solar steam generation system (Collector area 94.6 m²) by varying temperature and pressure. At 100°C temperature and at 1 bar pressure the average thermal efficiency observed is around 36% & overall steam generation rate is around 38 kg/hr. For 120°C and at 2 bar pressure, it is 31% & 33 kg/hr respectively. Steam generated by CPC system is gives to ammonia absorption plant to generate AC effect.

2. 0.59 m² Prototype Fresnel's reflector System

- ✓ Reflector curve is modified by changing mirror strips position. The appropriate point with appropriate orientation has been achieved. Generally, the receiver pipe is surrounded by glass tubes. The glass tube is replaced by mirror cap. Thus the system would be more efficient, cost effective and require less maintenance.
- ✓ Absorptivity of black paint available in market (which is used as a coating on receiver) is calculated by our method and it is around 70%.

3. Heat Loss Experiments

Some heat loss experiments are performed in lab condition for different wattages and wind speeds on electroplating pipe, silvered pipe & solkote pipe and study the heat loss factor. In order to minimize heat loss 3cm thick insulated mirror cap used and study the heat loss. It is observed that mirror cap reduces.

4. Reflectivity experiment

Reflectivities of different mirror sample having different thickness are calculated by using spectrophotometer in the wavelength range between 400nm-700nm. The average reflectivity at wavelength 550nm.

5. Inclined solar chimney experiment

To increase the efficiency of ISC Different model are designed. Experiments are performed by varying parameters such as constriction ratio, and collector area. It is observed that triangular model having constriction ratio 10 gives better mechanical

efficiency. Also this type model is better and cost efficient for generating electricity in hilly region.

Along with above work some experiments are performed on CPC system with (MS) receiver pipe and single glass tube on receiver pipe. At 100°C temperature and at 1 bar pressure the average thermal efficiency observed is around 34.8% & overall steam generation rate is around 36.3 kg/hr (for 4 hours).

⇒ **Expected work during year 2012-2013**

➤ 94.6 m² CPC System

Study performance of CPC system with (MS) receiver pipe and single glass tube on receiver pipe. Steam generated by CPC system is gives to Vapour Absorption Machine to generate AC effect, Also study heat loss and thermal efficiency of CPC system.

★ **TITLE: DISINFECTION OF WATER FOR POTABLE USE**

Aim of the project is to deliver disinfected water (or water with pathogens within the prescribed limits or to reduce the number of pathogens which are responsible for causing the water borne diseases) delivered by a standard/modified hand pump. To achieve this, it is necessary to understand the underlying principles of pumping, cavitation, disinfection due to cavitation, mechanism and hydrodynamics of hand pump. Till now, we have carried out this work in following steps.

★ **Literature survey on disinfection of bore well water using hydrodynamic cavitations, mechanism of pumping in hand pump.**

It was found previously (*Jyoti & Pandit, 2001*) that hydrodynamic cavitation is energy efficient and economic method for treating of bore well water. (Figure.1.)

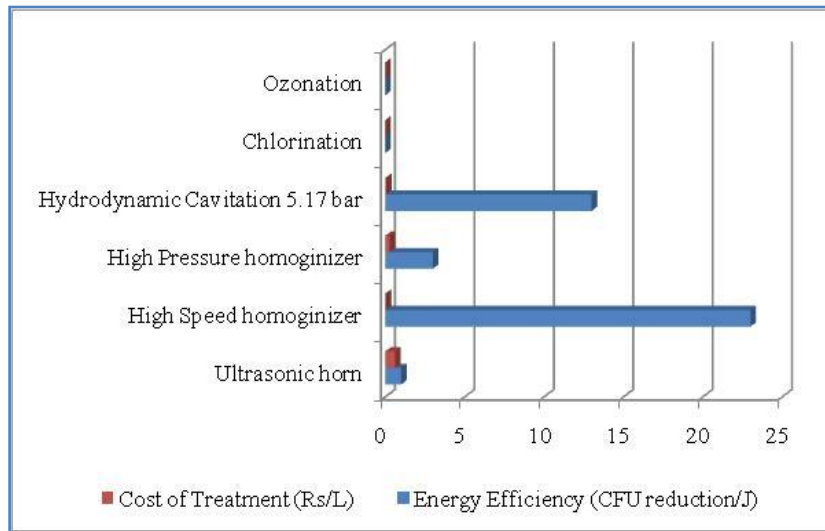


Figure.1. Cost Analysis and Energy efficiency of various disinfection techniques.

The mechanism of hand pump is based on the working principle of a positive displacement pump, negative pressure being the potential behind lifting of water from well to the surface level. Pitting is observed at the surface of the suction valve and valve seat of hand pump. This may be due to the following reasons. Firstly, it may be due to the presence of potential oxidizing agents in the groundwater, which depend on the underground water quality and the geometry of the pump. Secondly, due to hydrodynamic cavitation, such situation arises when an incoming water flow forms a lateral jet through the valve (which can be treated as an orifice of cylindrical shape), flashing the liquid on the head and seat of the valve. This leads to the erosion of the metal and thus pitting. Since there is an increase in the velocity of the fluid at the valve, pressure drops correspondingly, if this falls below vapor pressure of water, it can result to hydrodynamic cavitation.

We suggest that such a situation at the suction valve can be effectively utilized and possibly optimized or intensified for water disinfection while pumping of the water through the system.

A cast iron cylinder which is the main pumping unit of the hand pump was procured from Maharashtra state government. Cross sectional drawing (Figure.2.) of the valve geometry were generated.

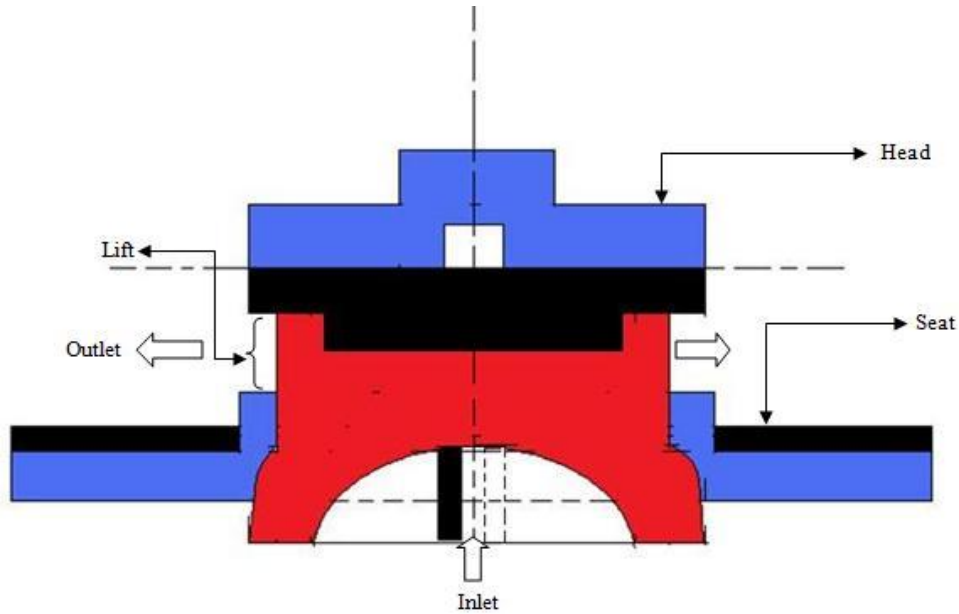


Figure.2. Cross sectional view of the lower check valve

In Figure.2. the head & seat are shown with arrows. The vertical distance between head and seat is the lift of the valve. Also the inlet and outlet for water are shown using block arrows.

★ Numerical simulations

Velocities across the lower assembly check valve has been modeled, to obtain the boundary conditions and to study the possible cavitation location and intensity at the valve. It has been numerically observed that there is no cavitation at the entrance of the valve. Since the cavitation number (defined as the ratio of difference of recovery pressure, P_r & vapor pressure of water, P_v to half the product of density of working fluid i.e. water, ρ_w and square of its local maximum velocity at inlet of the valve, v .

$$\delta = \frac{P_r - P_v}{\frac{1}{2}\rho v^2} \text{) is much higher.}$$

Further, we planned to study velocities across the opening between seat and head (Figure.2.) of the valve, since pitting was observed in this particular region. Numerical simulation showed a good promise for the occurrence of cavitation in this particular region as cavitation number as low as 2 to 10 were obtained, indicating the possibility of cavitation in the region.

★ CFD Simulation

Geometry of the check valve was generated in Gambit and simulations were carried out using Fluent.6.2.16. Following terms were defined before simulating the geometry. (Figure.3.). **Lift**, the vertical distance between head and seat. **Annulus**, annular space available for flow between the head and seat. **Flow area**, cross sectional area available for flow of fluid can be calculated as cross sectional area of valve multiplied by the ratio of current lift of the valve to total lift of the valve.

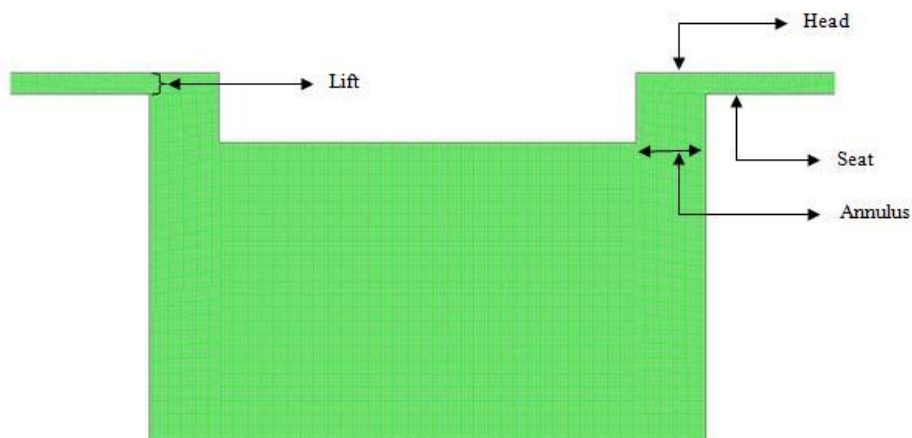


Figure.3. Grid of check valve created in Gambit representing lift and annulus.

Simulation were carried out by hypothetically varying the flow area from 10% to 100 % flow area opening by hypothetically adjusting the lift of the valve in geometry, at 40, 50 and 60 strokes per minute typically that of water pumping activity.

For 40, 50 and 60 number of strokes, the volumetric flow rate of water and water velocity at different locations is determined developing velocity vector diagram.(Figure.4.)

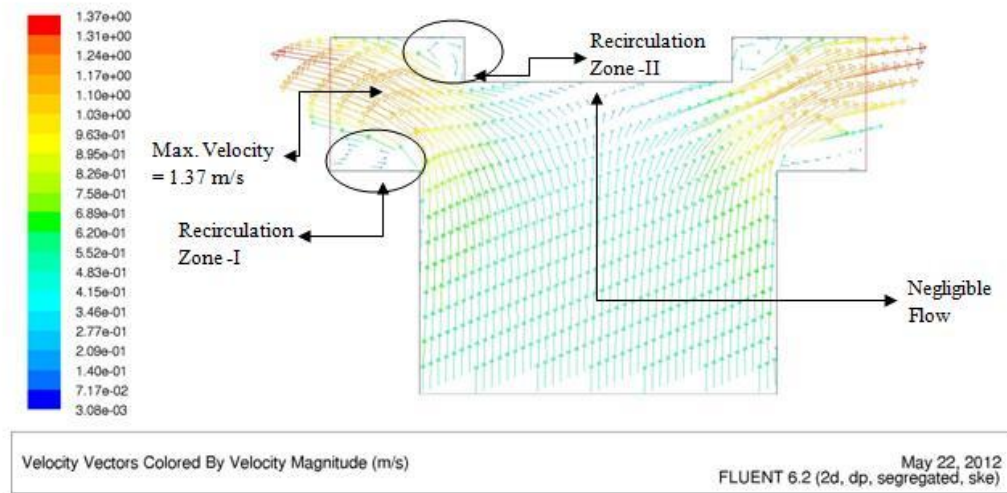


Figure.4. Velocity Vectors

Figure.4. shows the velocity vectors across the valve for operating frequency of 40 strokes per minute, inlet velocity 0.597 m/s and 100% flow area opening. Arrows represent the flow path of water.

Volumetric flow rate in m^3/s is calculated by multiplying discharge per stroke to time required for one stroke.

From the result of simulations and the calculation of cavitation number it can be said that up to 30% flow area, the outlet pressure increase rapidly after which there is only a marginal change in the pressure. This is because up to 30% flow area the cross sectional area available for flow is an annulus whereas after 30% it suddenly increases to a circle (or simply the annulus disappears). (Refer Figure.5. & the sequence shown thereof)

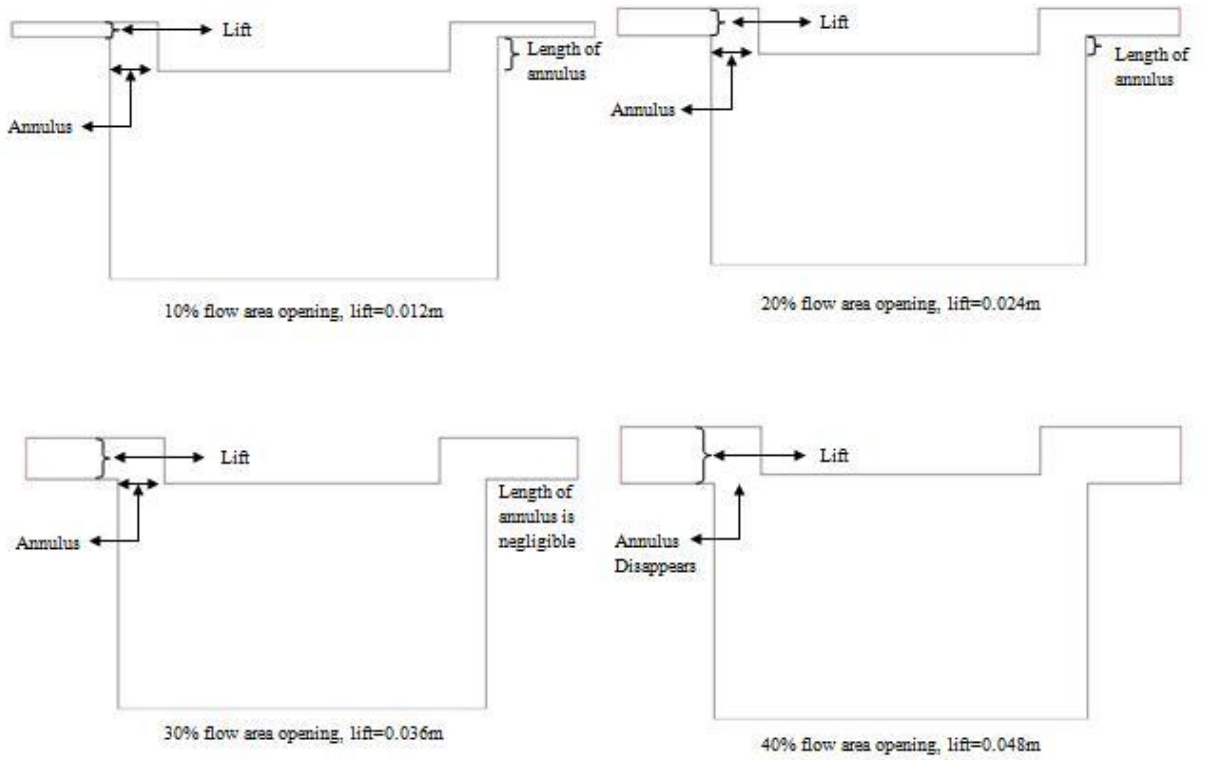


Figure.5.Mechanism of disappearance of annulus

Thus, a sudden increase in area reduces the velocity of fluid increasing the outlet pressure which may promote the collapse of cavities generated earlier.

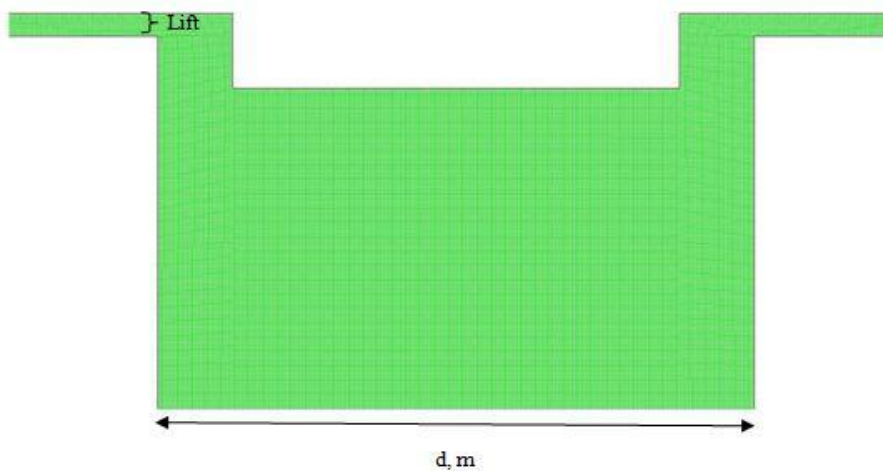


Figure.6. Diameter and lift of valve for the calculation of Reynolds No. (N_{Re})

As the lift of the valve increases, the Reynolds number (defined as, $N_{Re} = \frac{dv\rho}{\mu}$, where d is the inlet diameter of valve in m, v is velocity of water at the lift of valve in m/s, ρ is the density of water in kg/m^3 and μ is the viscosity of water in N.s/m^2) for the flow decreases (reduction in velocity) and cavitation number increases due the change in available flow area corresponding to a decrease in velocity of water. (Figure.7.)

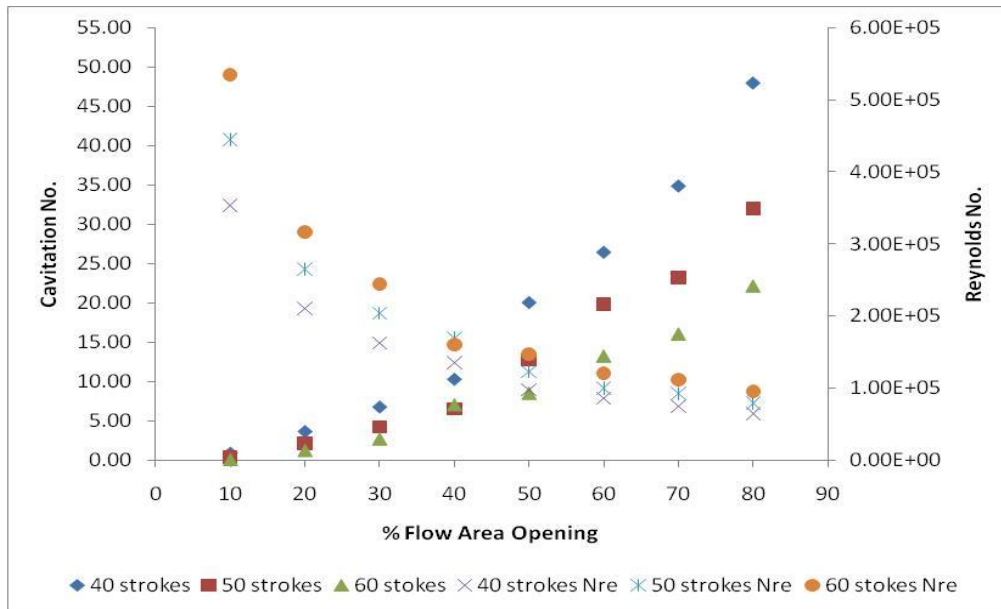


Figure.7. Effect of Flow area opening on cavitation no. and Reynolds no.

II Centres – Projects Concluded

8. CENTRE FOR DISASTER MANAGEMENT

University of Mumbai's Centre for Disaster Management was envisioned to recommend actionable steps for civil society and state agencies to implement and strengthen disaster mitigation, preparedness and response strategies. Two departments are associated with the centre: Department of geography and Department of Applied Psychology. It was proposed by this centre to develop and operate at the state and national level with special expertise in the western region. The Centre would serve needs of

- ❖ disaster management professionals
- ❖ interested citizens
- ❖ intense research and rigorously designed education/training programs

⇒ *Main Objective of this Centre is:*

- ✓ Disaster preparedness, mitigation and management
- ✓ Citizen Preparedness and Public Education
- ✓ Developing Disaster Information System (DIS)

⇒ *Research projects of this centre are:*

- ✓ Disaster Management and Decision Support
- ✓ System for Konkan with special reference to Planning and Mitigation
- ✓ Analysis of Stress and Coping in Disaster Affected Populations

⇒ *The centre conducted to certificate courses in the year 2008*

- ✓ Environment Management and Disaster Mitigation
- ✓ Disaster Counseling

These courses will be followed by a Diploma Course in Disaster Management. Eventually it is proposed to offer a Degree Course. Centre participated in Mumbai Emergency management Programme (MEMEX) in 2008 and 2010.

- Centre organized a half day seminar on '**Earthquake: Causes and Management**', in collaboration with Dept. of Applied Psychology on 24th March, 2011.

- On 20th of June 2011 in collaboration with University of Cologne, Dept of Geography, School of Planning and Architecture, New Delhi conducted International Workshop on **‘Geofactors and Civil Crisis Prevention in Megacities’**. Centre also conducted 3 day short term course for teachers on **‘Disasters, Management and Mitigation’**, with UGC Academic Staff College, University of Mumbai
- Paper presented on **Disaster Information System for Mitigation and Management -Greater Mumbai Case Study** at 33rd INCA International Conference by Dr.Dipti Mukherji and Dr. B. B. Sonule, Jodhpur, 19-21 September, 2013.

Shortly advertisement for the post of 2 Research Associates will be advertised for the Research Projects. Related infrastructure is partly procured.

Commencement of the Certificate courses will be advertised.

9. CENTRE FOR BEHAVIOURAL RESEARCH

The centre has undertaken six projects simultaneously.

1. FORENSIC PSYCHOLOGY:

❖ Data collection:

- a. Data collected regarding Psychometric evaluation and its role in behavioral forensic approaches.
- b. In the process of data collection: Cybercrime, computer hacking and preventive strategies for India.
- c. Single case study: Detailed and confidential evaluation of high security prison inmate on Government directive.

❖ Methodology:

- (a) Survey
- (b) Questionnaire (one to one)
- (c) Psychological assessment (one to one)
- (d) in depth qualitative observations and detailed narrative case records.

❖ Observations: Time spent with people being studied for Forensic implications leads us to discover personality facets of cybercriminals, criminals with psychiatric history, unsound mind, lack of testamentary capacity, etc.

❖ Seminars/ workshops:

- ✓ Poster presented at 37th National Annual Conference of the Indian Association of Clinical Psychologists at Ahmedabad in January 2011: *Psychological Evaluation of Minors in Long Term Institutional Care –Legal and Ethical implications.*
- ✓ Symposium Paper presented at 38th National Annual Conference of the Indian Association of Clinical Psychologists at Pune in January 2012. *Profiles of criminal v/s non-criminal and psychiatrically ill v/s well males and females using the MCMI III and MMPI 2.*

❖ **Papers presented related to Forensic psychology:** (presented by Panna Rele, Research Fellow.) As above:

- ✓ Psychological Evaluation of Minors in Long Term Institutional Care –Legal and Ethical implications.
- ✓ Profiles of criminal v/s non-criminal and psychiatrically ill v/s well males and females using the MCMI III and MMPI 2.

❖ **Complementary activities:**

Dr. Sovani inaugurated the website for Responsible Netism in an effort to contain Computer crimes. The effort is in collaboration with Cyber Crime cell Thane Police. A public awareness program was held at the Thane Municipality Auditorium on the occasion.

❖ **Publications :**

Dr. Anuradha Sovani is working on a paper for Archives of General Psychiatry focusing on Personality patterns prone to crime and aggression. On completion it will be sent for peer review.

❖ **Future plans of action:**

The project needs to be continued along the same track in order to document the findings of the ongoing study, as well as efforts to document the impact of Responsible Netism programs, specifically aimed to contain cyber crimes and computer hacking.

Two more years would help to satisfactorily wind up the work in progress

❖ **Project 02: Multiculturalism: An interdisciplinary Investigation and intervention:**

- ✓ Centre for Behavioural Research has initiated this project in August, 2009. The main objectives of this project are to investigate multiculturalism and its psycho-social perspectives, to develop multi-disciplinary assessment and interdisciplinary interventions, to investigate multiculturalism correlates, to understand role of the state: Groups, different schemes and activities, to study assumptions and attitudes of each culturally diverse groups and to recognize and respond to mental health needs of diverse groups. After having clearances from various authorities and following due procedures, one research project fellow was

appointed in February, 2010. Along with this, all necessary infrastructure including computers, laptops, hard disks, printers and books were purchased.

- ✓ Following this, literature was reviewed to identify the key variables in understanding of multiculturalism. These were related to prejudice, discrimination, collective self-esteem, stigma consciousness, etc. Along with this, published tools were identified that could be used in the data-collection procedures after adaptation. In view of the goals of this project, it was decided to conduct research and data- collection to study Multicultural Personality, Attitudes towards Religious Diversity, Prejudice Against Muslims, Neighbourhood and School Cohesion among young adults. Data of over 250 young adults was collected. Research Paper titled ‘The Role of Multicultural Personality in Attitudes towards Religious Diversity: An Associational Study’ was presented at the Silver Jubilee Conference of Marathi Manasshastra Parishad on ‘Psychology of Violence’. It was awarded Best Faculty Paper Presentation. This conference was actively attended by 150 participants from Mumbai and different parts of Maharashtra including Pune, Sangli, Amravati, Jalgaon, Nagpur, Kolhapur, etc. as well as other states including Andhra Pradesh, Chattisgarh, New Delhi, etc.

- ✓ Following this, the Prejudice Scale (Jahan et al, 1981) was translated to English from Hindi, with a high internal consistency($r = 0.89$) is ready for use in future research studies. The Attitudes towards Religious Diversity Scale was adapted from subscale 2 of Quick Discrimination Index (Ponterotto et al, 1995) and is ready to be used ($r = 0.56$) for further research. Since March, 2011, data-collection and statistical analysis was conducted for the Multicultural Ideology Scale (Berry & Kalin, 1995), so as to adapt it to suit the Indian conditions. This scale is now ready to be used in further studies ($r = 0.6$). The Research Project Fellow attended a 3 day Workshop on Research Methods conducted by University of Mumbai, to enhance understanding on the various research methods deemed useful for project’s research efforts. In June 2011, a presentation on ‘Collective Memory: Psycho-social perspectives’ was made at the Franco-Indian Seminar on ‘Memory and Memorialization’. Data collection was undertaken on over 200 young adults. Post this, drafts of Research Papers in the area of Multicultural Personality, Counselling Self-Efficacy, Attitudes towards Disability were drafted. In February, 2012, a research paper titled ‘Impact of Globalization on Cultural Identity:

Understanding Exclusionary Processes' was presented at the Marathi Manasshastra Parishad. In May 2012, a draft of this paper was then prepared to be sent for publication. More data was statistically analyzed in June 2012. The beneficiary of this project include a Research Scholar working in this area, along with NGOs and GOs working in the area of communal harmony and peace initiatives as well as society at large.

2. *Rehabilitation Psychology (Clinical):*

❖ Data collection:

- a) Data collected regarding perceived stigma associated with mental illness and changes in perception accompanied by recovery. N=50.
- b) Data collected from people recovering from schizophrenia, self perceptions, attributed causes of rehabilitation and inclusion into mainstream society. N=15
- c) Data collected from caregivers of schizophrenia vis a vis their perceptions about patient rehabilitation. N=50
- d) Data collection in process: professional caregivers of people living with persistent mental illness, in long stay institutions. Perceptions about schizophrenia. Stigma measurement. N=30.
- e) Data pertaining to cognitive processing in people living with persistent mental illness collected with different target groups.

❖ Methodology:

- a) Survey
- b) Questionnaire (one to one)
- c) Neuropsychological assessment (one to one)
- d) In depth qualitative observations and detailed narrative case records.

❖ Observations:

Time spent with patient and caregiver groups, rehabilitation technology training workshops. There is an attitudinal shift gradually occurring at policy level and needs

to translate to attitudes and perceptions of laypersons. Rehabilitation needs to become more the norm than the exception.

❖ **Seminars/ workshops:**

1. Dr. Anuradha Sovani presented an invited international symposium paper titled “Teach me so I can learn” in a symposium titled Employment and Mental Health, at the International Conference on Schizophrenia IV, where the two other symposium speakers, Dr. Susan McGurk and Dr. Kim Mueser presented the Western perspective, and Dr. Sovani presented work from India.
2. Invited symposium at the National Annual Conference of the Indian Association of Clinical Psychologists at Pune in January 2012. The symposium was titled Group Interventions for Mental Health, and Dr. Sovani presented work on Schizophrenia.
3. Dr. Sovani is invited to present her work on “Recovery, Rediscovery and Empowerment” at the International Conference on Schizophrenia scheduled to be held at Chennai in September 2012, wherein all the ongoing work with caregivers, high functioning people with schizophrenia as well as new rehabilitation and recovery initiatives will be presented by her in a Symposium session in which the other two speakers will be Ellen Corrin and Richard Fardig. (Symposium 17: http://www.icons-scarf.org/symposia_2012.pdf)
4. Dr. Sovani was invited by C-DAC to speak at a workshop on Computer interfaces for rehabilitation, where she spoke about possibility of utilizing FOSS for assisting recovering mentally ill, learning disabled as well as geriatric populations.

❖ **Papers presented related to Rehabilitation psychology: (presented by Dr. Sovani) As above:**

- ✓ “Teach me so I can learn” (IConS IV.)
- ✓ Group Interventions for Mental Health – Schizophrenia. (NACIACP)
- ✓ “Recovery, Rediscovery and Empowerment” (IConS V)
- ✓ Computer interfaces for rehabilitation – FOSS applications for Rehabilitation.(C DAC)

- ❖ Contribution of faculty worth mentioning in area of Rehabilitation Psychology:
 - ✓ Appointed on Core Committee for rehabilitation, Maharashtra State (Department of Health Services)
 - ✓ Currently involved in developing TOT program at State level to sensitize key mental health professionals and support staff of all State level institutions.
 - ✓ Involved in manual development for same.

❖ **Complementary activities:**

Dr. Sovani is also involved in rehabilitation and mainstreaming of special groups including people with epilepsy, cancer palliative care, Zilla level committee for women and child welfare, Rugna Kalyan Samiti of the Regional Mental Hospital and Geriatric Care project *Saptasopaan*.

Dr. Anuradha Sovani was invited to serve on the abovementioned Rehabilitation Committee, and attended meetings both at Arogya Bhavan, with Government representatives, Mental Hospital personnel and advisory board members, as well as at the Thane Commissionerate which also took a very proactive stance in this initiative. Dr. Sovani suggested the nomenclature “Saptasopaan” for this project, which is a Sanskrit term for seven steps, signifying the seven steps of caregiving. The project was inaugurated in May 2012 with State and District officials present.

Regarding rehabilitation of people with Mental Retardation, Dr. Sovani is on the Academic Committee of the National Institute for the Mentally Handicapped (NIMH), Secunderabad, and the Ethics Committees of The Research Society, Sewri, and the Institutional Review Board and Ethics Committee of Spastics Society and National Resource Center for Inclusion (NRCI).

Student participation or beneficiaries: Masters students are involved in activities related to the above as far as they overlap with their regular field work, in a manner that would not allow the latter to suffer. They are also invited to free Public programs such as Dwij Puraskaar which is held annually, and rewards Recovery from Persistent Mental Illness.

❖ **Impact of the project:** Impact in terms of policy change and Rehabilitation Initiatives by the State Government are seen in commencement of Rehabilitation activity at the State level Regional Hospitals supervised by Core Committee for Rehabilitation of which Dr. Sovani is a member. A TOT workshop is scheduled for August 2012.

❖ **Publications in press:**

- 1) Dr. Anuradha Sovani has contributed a chapter titled *Mental Health Interventions at Community level* to a forthcoming Tata McGraw Hill publication titled *Current trends and issues in India for Social Psychology of Health*.
- 2) Dr. Sovani's paper on Schizophrenia caregiver burnout titled '*Intervention for burnout experienced by caregivers of people with schizophrenia- An evidence based study*' is in press in the forthcoming issue of Archives of Indian Psychiatry.
- 3) Dr. Sovani's paper titled *Visual and verbal memory deficits in adults and children with Temporal Lobe Epilepsy* is in press for the forthcoming issue of Disabilities and Impairments- A multidisciplinary research Journal.

❖ **Future plans of action:**

The project needs to be continued along the same track in order to document impact of best practices instituted in the field of Rehabilitation of Persons with Persistent Mental Illness, for which advance is sought. Some tests for assessment have also been ordered after seeking due permissions, but are not yet with the Center. Two more years would help to satisfactorily wind up the work in progress.

3. Rehabilitation Psychology –(Counselling)

The research project titled Rehabilitation Psychology started with the notion of the increased importance of rehabilitation in both physical disabilities and mental illness. It aims at identifying, exploring and introducing the various new perspectives to rehabilitate the people with physical disabilities (such as hearing impaired, visual impaired, orthopedically impaired) at psychological as well as vocational level. The objectives of the research project include:

- ✓ Collaboration between academia and NGO.
 - ✓ Programs for various special populations under the aegis of the center.
 - ✓ Documentation of results in terms of Quality of Life changes for concerned people.
 - ✓ Documentation of the intervention modules executed so far.
 - ✓ Launching courses in the field of Rehabilitation psychology, perhaps in collaboration with national and international institutes.
 - ✓ Completing all documentation and dissemination.
 - ✓ Publication of the above documentations for public consumption.
- ★ Considering the first objective, successful collaboration with the following organizations has been established:
- ✓ Vocational Rehabilitation Centre, Sion (GO) and
 - ✓ NAB Workshop for the Blind, Worli (NGO).

A research on **“Reconceptualizing Frustration Aggression Hypothesis: A Study of Vocational Instructors for persons with Disability”** was carried out successfully as a part of this project in the year of 2010. In this research study, an attempt was made to understand the relationship between frustration and aggression in vocational trainers of persons with disabilities, by understanding the relationship of the type of Aggression and the Direction of Aggression (Rosenzweig picture frustration study); Forms of aggression- Physical, Verbal, Anger and Hostility; and the factors related to anger management like escalating strategies, negative attributions, self awareness and calming strategies. For this purpose, three Field Investigators were appointed. Data was collected from 30 vocational trainers working in different four vocational training centres for persons with disabilities in Mumbai. Correlational and regression analysis was utilized for data analysis. The research paper was presented in the UGC sponsored Regional Psychological Conference organized by the College of Social Work, Amaravati in the Sant Gadge Baba University in August 2011 and is in the process to get published in a professional journal.

A second research paper on **“Socio-Cultural Issues Related to Women with Physical Disability in India”** was presented in the psychological conference held at Amaravati in 2011. This paper was purely theoretical. Hence no primary data was collected

for the same. This paper presented at the conference served as a platform for young psychologists working in both urban and rural areas to increase their awareness regarding issues which arise as a result of the interaction of gender and disability leading to double disability status of women with disabilities.

In February 2012, a paper on “**Factors Associated with Non-Usage of Assistive Devices by People with Disability**” was presented in Marathi Manasshastra Parishad held at Mumbai. This paper is getting revised in the light of discussion in the conference for which data collection is yet to be completed. Data will be collected from 90 people with disability; i.e. hearing impaired, orthopedically impaired, and visually impaired.

A Research paper on “**Correlates of Assertiveness: A Study of Adults with Visual Impairment**” is in the process to get published in the Journal of Psychological Researches and the research paper on “**Personality Correlates of Youth Attitude towards Persons with Disability**” is in the process to get published in *International Journal of Disability*. Research paper on “**The Effect of Physical Disability Labeling on Facial Attractiveness Ratings of Youth: An Exploratory Study**” is in process of being sent for publication.

Three students in the Department are presently doing their Ph.D. in the area of Rehabilitation. The centre provides them infrastructural support in form of books and other reference materials and also by referring them to various NGO's, the centre has collaboration with.

A One Day Workshop on Post-Graduate Teachers' Sensitization on “**Persons with Disability in Higher Education**” was conducted on 27th March, 2012. In this workshop, problems faced by people with disabilities in higher education were addressed. Mr. S. Z. H. Zaidi, Deputy Director and Psychologist from Vocational Rehabilitation Centre for Handicapped, conducted a very interactive session on disability and its psycho-social issues. Mr. Chandrashekar Kulkarni, an official from National Association of Blind, conducted a session on assistive technology used by persons with visual impairment in the process of educational and vocational rehabilitation. Ms. Caryn Mendes, Psychologist and Sign Language Interpreter, conducted a session on Sign Language for basic concepts for teachers in the workshop.

Community Awareness Programmes were conducted on the White Cane Safety Day on 15th October for three consecutive years i.e. 2009-2011 at various places in the University campus. Herein the students from the Department of Applied Psychology, students with

visual impairment from the University & trainees from the NAB Workshop for the Blind, Worli; went around speaking to teachers, students and non-teaching staff from university and also distributed handouts to enhance awareness about the abilities and functioning of persons with visual impairment.

Proposed activities in addition to actual research, include:

- To introduce intervention modules for rehabilitation of people with disabilities.
- To conduct short term courses in the field of rehabilitation psychology.
- To enhance disabled-friendly environment in academic institutes.

Beneficiaries from the above mentioned activities will be people with disabilities as well as the persons working or dealing with people with disabilities.

If the period of project will be extended for another two years, the above future plans can be achieved.

4. Violence on Child and By Child (Period of three years)

The project **Violence on Child and by Child** is the part of **Centre for Behavioural Research** was actively started from 1st Feb 2010.

The main objectives of the project are:

- ✓ To develop preventive and promotive action plans and reaching it to target population through government action plans, government agencies and NGOs.
- ✓ To develop a focused professional group with proper certification (through focused course run by UDAP) to deal with highly exposed child group.
- ✓ To spread awareness regarding violence on and by child to different segments of society and developing a help group and network.
- ✓ To develop action plans to rehabilitate and provide professional services to child at high risk.
- ✓ To prepare a policy document to protect child against violence.
- ✓ To publish a comprehensive book and articles with research data of this project, and documentation of various psycho-social factors leading to violence on or by child etc.

After completing all formalities, one Project Fellow was appointed in the month of Feb. 2010 for the period of one year that is from 1st February, 2010 to 31st January, 2011. First two months i.e. February and March, were utilized for setting up infrastructure and to discuss for further action plans. Computer, printer and required books were purchased to ensure effective work.

At initial level, a research was designed through intensive discussion between Project Coordinators and Project Fellow. The research titled **“A Study of Exposure to Violence, Abuse, And Normative Belief About Aggression Among Children”** In this study independent variables were child abuse, type of housing, and gender. Among these, type of housing and gender had two levels. In type of housing, children staying in slum and children staying in buildings were studied. Dependent variables were exposure to violence and normative belief about aggression. The control variable was age of children, i.e. 8-12 years. The study was designed to compare the gender, type of housing and child abuse and also to explore the correlation of exposure to violence and child abuse with normative belief about aggression. To study exposure to violence, a structured interview questionnaire was utilized wherein questions related to exposure to violence framed in close ended manner. To measure child abuse, “Child Abuse Scale” (Farah D. Malik and Ashiq A Shah, 2007) was used and to measure the normative belief about aggression “Normative belief about aggression scale” (Huesmann, L. R., Guerra, N. G., Miller, L., & Zelli, 1992) was used with the consent of the author. **2x2x2 factorial design was used in this research.**

The data collection completed in almost four months. A Field Investigator was also appointed for data collection. A total **200 respondents were collected from Mumbai.** Out of 200, half of the data was collected by Field Investigator. The data was collected from slum area and from the established societies of Mumbai.

In the month of Feb. 2011 the Project Fellow was reappointed.

The **awareness program** for parents of Primary and Pre-primary children was organized in June, 2011 at St. Anthony Boys High school, Vakola. The program was organized by the school with collaboration of Centre for Behavioural Research. Mr. Naresh Tambe, Project Fellow, Centre for Behavioural Research, was invited as a resource person to address the parents. While addressing the parents, he **focused mainly on awareness about emotional and physical violence, effect of emotional and physical violence on children and effective parenting techniques.**

In the period of February, 2011 to August, 2011; another research paper was designed on **”Gender Discrimination in Health and Education: A Study of Emotional Violence”**. To study the gender discrimination **self-structured interview method** was used. Close ended questions were prepared for the purpose of interview. The objective of the research was to study the discrimination between male and female child in health and education. **The data from 200 respondents was collected within a period of four months.** This was comparative study of municipal school going children and private school going children. This research paper is ready for the publication.

In the period of September 2011 to January 2012, another research paper was designed on **”The Effect of Psychosocial Intervention on Violent Behaviour of Primary School Going Children”**. The objective of this research was to see the effect of different psychosocial intervention strategies on violent behaviour of children. In this research 120 children were selected from one primary school. **Independent two group design was used for this study.** At the initial stage of research, a problem check list was given to teachers and parents of 120 students. The problem check list consisted of a number of problems which indicates the violent behaviour of children. Parents and teachers were asked to rate the items on 3 point rating scale. Sixty children with most violent behaviour were identified. These 60 children were further divided in experimental group and control group equally. In experimental group, parents and teachers were introduced some psychosocial intervention strategies whereas the control group was not introduced to any intervention strategies. After the period of two months, the same problem check list was given to the teachers and parents of those 60 children. Rating by teacher and parents on problem check list indicates that children in experimental group showed significant difference whereas children in control group did not show any difference in their behavior. This research Paper was presented in 26th Annual Conference of “Marathi Manasshatra Parishad” at Chetana College, Mumbai held on 10th and 11th Feb. 2012. This research paper was awarded as **“Best Research Paper”** and was further revised in the light of discussion in Marathi Manasshastra Parishad.

On 1st February, 2012 the Project Fellow was reappointed for the remaining period of the project. All research papers are in progress for publication. By referring relevant literature and observation, the handbook titled **“Handbook for Parents of Primary School Going Children”** is becoming ready for parents to deal effectively with their children.

➤ **The Future Action Plan:**

- ❖ Data need to be collected from Orphanage homes for the purpose of further research.
- ❖ Proposing to organize short term Course on “**Preventing Child Abuse**” to develop focused professional group.
- ❖ Proposing to write Handbook titled “**Handbook for Parents of Primary School Going Children**” for parents to deal effectively with their children. This book is proposed to publish in English, Marathi, and Hindi Languages.
- ❖ **To conduct Community Awareness Program.**
- ❖ To conduct workshop for **Police Employees** to create awareness about child abuse.

If the period of project will be extended for another year, the above future plan can be achieved.

5. Structure of Self : Psychological and Sociological mapping across gender, age and caste in urban and rural Maharashtra

The Research Project titled ‘Structure of Self’ aims to study the personality factors of people across various regions of urban and rural Maharashtra based on age, gender, caste and geographical location.

Various scales of personality are been used including NEO-PI-3, FFPI, EPQ-R, etc. Marathi adaptation of some tests is done. The project intended to conduct specific researches in the area of personality and its stability across various socio-demographic aspects of Maharashtra.

➤ Data Collection:

Various studies were planned and conducted in this project. These studies involved areas like just perceptions, tendency to fake, social desirability, self-esteem, perception of worth, and personality deviations. The studies have been on various samples since the mandate is to investigate rural urban Maharashtra, data was collected from various areas.

➤ **Data Collection for studies:**

- ✓ Data collection in progress for two studies in rural and urban Maharashtra. Data collection network at rural areas are built up at Ahmednagar, Ratnagiri, Rahuri and Ambegaon districts. Sample size: 2400. Data collected 800 so far.
- ✓ Data collection is complete across various districts of Rural and Urban Maharashtra including Mumbai, Pune, Thane, Raighd, Ratnaghiri, Pune, Ko;lhapur, Usmanabad, Nagar, Aurangabad, etc. Sample size: 2400. Data collected 800 so far.
- ✓ Data collection is completed of the study multiple group stability of personality structure over time: multiple group analysis. This requires permission from the researchers who did the data collection earlier (30 years ago). **This is partly based on secondary and partly on primary data.** The permission process is in progress. The Primary data collection is over. We have acquired secondary data on personality profiles. **Sample size: 300 + 250 + 340 = 890**
- ✓ “FFM across instrument” study data collection is complete. The paper is under progress. Sample size: 310.
- ✓ The Just world Perception and cultural differences: sample size 340 data collection complete.
- ✓ Perceptions of self: qualitative data: data collection is ongoing: Visual and auditory data is being collected using in depth interview method. Sample size: 60. 10 interviews are conducted so far.
- ✓ Study on Personality disorders and personality structure: data collection complete: 240: paper published.
- ✓ Participated in cross-cultural investigation: data of 100 from India.

Adaptation of FFPI and data collection is complete. Preparation of the manuscript is under progress.

➤ **Data processing:**

The research uses survey, questionnaire, and experimental methodology. In addition studies using qualitative approach are in progress.

Quantitative Analysis: The data is processed using primarily quantitative approach. The software package R is used for data processing. The statistical analysis used range from descriptive statistics to multivariate statistics. They include Correlational Analysis, Reliability Analysis, MANOVA, Discriminant Function Analysis, Multiple and Logistic Regression, Factor Analysis, Structural Equations Modeling, etc.

➤ **The qualitative analysis :** The qualitative analysis is primarily based on grounded theory approach. It is used in analysis of in depth interviews.

➤ **Other data procedures:** The computer programs are written to conduct experimental study will soon be conducted. It takes writing program using open source programming languages in python.

➤ **Observations:**

Observations that are salient are noted here:

1. Personality structure is relatively stable
2. Self-esteem shows cultural variability though some aspects are common.
3. Perceptions of just world are bidimensional and need instruments that go beyond the social realities.
4. Social desirability is stable personality factor and measures of lie and faking have little value if any.
5. Personality disorder conceptualization need to be revised in the light of normal personality findings and cultural context.
6. Specific differences have been observed in demographic groups in Maharashtra on personality structure, it is premature to comment since data collection is still in progress.

➤ **Seminar Workshop:**

Not conducted.

➤ **Papers presented related to the project:**

★ **Papers published/ presented:**

1. Presented a paper at annual conference of BPA on **‘Rosenberg’s Self esteem scale: factorial invariance across groups and personality co-relates’**
2. **Truth of Lie and Red Herring: Dimensionality and Utility of Lie Scale in Personality Assessment.** Presented at the Meeting of Centre for Behavioural Research (University with Potential for Excellence - UGC) at Department of Applied Psychology University of Mumbai.
3. Paper on EPQ-R lie scale manuscript is prepared and submitted to an international journal (Personality and Individual Differences, England)
4. Paper published in Belhekar, V. M. & Sabnis, S. V. (2011). Five-Factor Model of Borderline Personality. Indian Journal of Clinical Psychology, 37, 6-16.
5. Tafarodi, R. W., Bonn, G., Liang, H., Takai, J., Moriizumi, S., Belhekar, V., & Padhye, A. (in press). What makes for a good life? A four-nation study. Journal of Happiness Studies. Accepted for Publication.
6. Paper completed on ‘Just World Scale: Dimensionality and psychometric properties’. The paper was presented in BPA Conference in February 2012. The paper is submitted to a journal.
7. Paper completed on Self-esteem structure: to be communicated to a journal.
8. What Predicts the achievement? Critical evaluation of the EI as compared to other psychological constructs. Paper Presented at National Association of Psychology (NAOP), March 2010, Bangalore.
9. 3. Belhekar, V. M. et al. (2009). The Borderline Personality: Exploring the Role of Affective Instability and the Five-Factor Model Neuroticism. Journal of Psychological Researches, 53 (2), 91-99.

➤ **Manuscripts under preparation**

- ✓ ‘Rosenberg’s Self esteem scale: factorial invariance across groups and personality co-relates’
- ✓ ‘Just World Scale: Dimensionality and psychometric properties’
- ✓ multiple group stability of personality structure over time: multiple group analysis
- ✓ FFM across instrument
- ✓ NEO-PI-3 stability and psychometric properties.

➤ **Contributions Worth Mentioning**

International associations regarding the project work: International collaboration on Marathi adaption of FFPI with psychologist at Netherland. An association with Canadian researchers lead to publication of paper.

➤ **Psychological Scales Developed and Adapted and Preparation of Manuals.**

- ✓ Marathi translation of NEO-PI –3 is completed. NEO-PI-3 one of leading personality assessment tool: NEO-PI-3 Adult Comprehensive Kit and NEO-PI-3 Adolescent Comprehensive Kit. This is the first adaptation of NEO-PI-R in any Indian Languages.
- ✓ Marathi adaptation of FFPI: only adaptation available in Indian languages.
- ✓ Marathi translation of NPI and Need for Cognition is in process.
- ✓ Development of Psychological instrument on FFM based on Local data and language is underway. Such a instrument is missing in the present academic research in this part of the world.

➤ **Complementary activities:**

Expertise in multiple group data analysis, structural equation modeling and software packages is acquired.

Network with psychologists and non psychologists in rural Maharashtra created for further research activities.

➤ **Students Participation:**

In some of the studies students have participated in data collection as well as participant for the study. They were give feedback for their participation.

➤ **Impact of the project:**

1. Data across various demographic factors on psychological construct is available for the first time.
2. Deeper understanding of personality process is obtained.
3. Developing better theorization of self structures in cultural context.
4. Developed Manuals and Tests are available for use in further research.
5. Specific research questions are created. E.g. role of O in culture, etc.

➤ **Publications**

Listed above

➤ **Future Plans**

The project duration is getting over on 15th July 2012. Indeed, the Project contains collection of variety of data and establishing stability of personality structures. The Data collection work is almost about to over though some data collection is still remaining. The data analysis, interpretation, review work and writing of report will require almost more than one years' time. The proposed duration of the project is 5 years whereas the sectioned duration is 3 years. The project can achieve a meaningful goal if the continuation in terms of time is granted. The Duration of UPE scheme is up to 2014, so this extension is within the duration of the UPE scheme. We will also be

able to spend rest of the funds that are allotted for remaining purposes. The extension will help in

- a. Completing little data collection that is remaining
- b. Completing the review work
- c. Data analysis of part of the data
- d. Preparation of manuals and finalization of development process of psychological test
- e. Exhausting the budget

It is important to note that the project requires continuation in terms of time (Two years) in order to finish the work that is remaining.

6. Self-Concept and Suicidal Behaviour Among Physically Challenged

The project fellow was appointed on 1st February, 2010 on the research project for period of one year. The same project fellow was reappointed for further one year i.e. from 1st February, 2011.

Research paper titled “Relationship between Distress Tolerance and Coping Styles among Suicide Ideators and Non-Ideators” was presented in the Regional Psychological Conference organized by College of Social Work, Amaravati in Sant Gadge Baba Amaravati University. The research aimed at studying the relationship between distress-tolerance and coping style in suicide-ideation and non suicide-ideation group. The research paper was appreciated by many experts in the conference. Data was collected from 80 young adults; 39 males and 41 females.

Three two-day workshops were conducted on teachers’ training for suicide prevention among students.

New research project fellow has to be appointed.

Relevant national and international research articles, books are read and the preparation for the literature review is started.

Various tools for measuring the main variables of the project like self concept, suicidal behaviour and also the variables which are considered as part of comprehensive model of the study are reviewed. The detailed interview schedule has also been developed to collect information about the specific issues related to the area of disability

and suicidal behaviour. Various institutes/ organizations working with physically challenged are identified for the data collection purpose.

The tentative budget for the data collection stage is prepared. The budget is prepared by considering the cost involved for collecting the data of approximately 300 participants. The process of identifying the field investigators who will help in data collection is started.

A small research study related to the area of disability and suicidal behaviour is formulated and the data collection is in process. Two standardized psychological tools and one semi-structured interview schedule will be utilized for the study. Data will be collected from 300 people. Further, qualitative and quantitative analysis will be conducted. Plan for data collection is ready waiting for the expenditure sanction from finance. Data collection can be done in four to six months. The completed research paper will be presented in the conference related to disability or suicide area.

Program on suicide prevention among persons with disabilities will be formulated and can be disseminated and executed. Beneficiaries would be population with disability, academics and people working in the field of persons with disabilities. One seminar has also been planned.

Research paper titled “Relationship between Distress Tolerance and Coping Styles among Suicide Ideators and Non-Ideators” has been published in *Disabilities and Impairments: An Interdisciplinary Research Journal*.

Books for project purpose have been purchased of the amount Rs. 1,20,000/-.

➤ **The Future Action Plan:**

- ✓ Data need to be collected and make a report of the same.
- ✓ To conduct Community Awareness Program.
- ✓ To conduct workshop for person with disability.

. Activities during the period January 2012 – December 2013:

- Terrorism and the ‘utility’ of people with ASPD trait patterns: Forensic significance of MCMI III and Rorschach Inkblot Assessment. *Archives of Indian Psychiatry*, 2013.

- One doctoral student is pursuing a research in the area of Forensic Psychology.
- The effect of physical disability labelling on facial attractiveness ratings among youth. *Disabilities and Impairment*, 27(2), 104-110, 2013.
- Developmentally appropriate counseling needs in Pediatric Palliative care. *Indian Journal of Palliative Practice*, 2013.
- Two doctoral students have completed the research in the area of Rehabilitation Psychology.
- One doctoral student pursuing the research in the area of Multiculturalism

7. *Self-Concept and Suicidal Behaviour Among Physically Challenged*

The project fellow was appointed on 1st February, 2010 on the research project for period of one year. The same project fellow was reappointed for further one year i.e. from 1st February, 2011.

Research paper titled “Relationship between Distress Tolerance and Coping Styles among Suicide Ideators and Non-Ideators” was presented in the Regional Psychological Conference organized by College of Social Work, Amaravati in Sant Gadge Baba Amaravati University. The research aimed at studying the relationship between distress-tolerance and coping style in suicide-ideation and non suicide-ideation group. The research paper was appreciated by many experts in the conference. Data was collected from 80 young adults; 39 males and 41 females.

Three two-day workshops were conducted on teachers’ training for suicide prevention among students.

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Relevant national and international research articles, books are read and the preparation for the literature review is started.

Various tools for measuring the main variables of the project like self concept, suicidal behaviour and also the variables which are considered as part of comprehensive model of the study are reviewed. The detailed interview schedule has also been developed to collect information about the specific issues related to the area of disability

and suicidal behaviour. Various institutes/ organizations working with physically challenged are identified for the data collection purpose.

The tentative budget for the data collection stage is prepared. The budget is prepared by considering the cost involved for collecting the data of approximately 300 participants. The process of identifying the field investigators who will help in data collection is started.

A small research study related to the area of disability and suicidal behaviour is formulated and the data collection is in process. Two standardized psychological tools and one semi-structured interview schedule will be utilized for the study. Data will be collected from 300 people. Further, qualitative and quantitative analysis will be conducted. Plan for data collection is ready waiting for the expenditure sanction from finance. Data collection can be done in four to six months. The completed research paper will be presented in the conference related to disability or suicide area.

Program on suicide prevention among persons with disabilities will be formulated and can be disseminated and executed. Beneficiaries would be population with disability, academics and people working in the field of persons with disabilities. One seminar has also been planned.

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Books for project purpose have been purchased of the amount Rs. 1,20,000/-.

➤ **The Future Action Plan:**

- ✓ Data need to be collected and make a report of the same.
- ✓ To conduct Community Awareness Program.
- ✓ To conduct workshop for person with disability.

If the period of project will be extended for another two years, the above future plan can be achieved.

10. CENTRE FOR RESEARCH IN THE FIELD OF EDUCATION.

The **MAJOR OBJECTIVES** of Centre for Research in the field of Education Project are:

- To conduct, applied research in the field of education.
- To suggest improvements in educational practices, policies and procedures.
- To undertake interdisciplinary research in education.
- To develop a databank
- To conduct seminars on the research themes.
- To bring out publications

SOCIO-ECONOMICS OF EDUCATION: TWO PROJECTS

1. Schooling and Life Skills Education in Mumbai : Issues and Alternatives
2. Developing an Educational Programme for ‘At Risk’ students from Lower Socio-Economic Background and Testing Its Effectiveness.

Research Investigators

1. Dr. Shefali Pandya
2. Dr. Satishkumar
3. Dr. B. V. Bhosale
4. Dr.Sunita Magre
5. Dr.Sudha Pingle

Research Project Fellow

1. Hetal Dagha
2. Divya Peter
3. Sandhay Khedekar (Ph.D Student)

Details of Project 1 on Schooling and Life Skills Education in Mumbai : Issues and Alternatives

Objectives:

- To understand the needs and problems of drop-out students.

- To develop an instructional programme for developing life skills in drop-outs and test its effectiveness with the objective of channelizing the dropouts as productive resources of the society.

Methodology Used: Mixed Methods Research

qual _____ QUAN

Phase 1 : Qualitative Research (Unstructured interviews of 10 school dropouts conducted to understand their needs and problems, Visits to BMC schools and other schools catering to students from the lower SES background to understand teachers' perspectives of the needs and problems of students). Analysis of Qualitative Data –Coding.

Phase 2 : Quantitative Research (Experimental Method)

Development of Life Skills Development Instructional Programme.

Development of Structured Tools

Construction of Tools

Studying the Effectiveness of Life Skills Development Programme for the students.

Analysis of Quantitative Data.

- **Qualitative Data:** Unstructured interviews of 10 school dropouts and 5 teachers conducted to understand the needs and problems of students. An attempt was made to identify problems and issues facing the students from the disadvantaged group concerning their future employment prospects and the kind of training they need in order to be productive citizens who can be gainfully employed. A qualitative analysis of the data using coding showed that the students were concerned with the following life skills :

1. Developing an Identity
2. Managing Emotions
3. Building Relationships
4. Resisting Peer Pressures

An instructional programme was thus developed to facilitate these life skills in the students.

- **Quantitative Data: Quasi-Experimental Design**

Pre-Test Post-test Non-Equivalent Groups Design

Instructional Programme : Discussions, Role Playing, Decision Mapping, Case Study.

Use of Structured Tools

Design O₁ C O₂ (N=17) O₃ X O₄ (N= 19)

Techniques of Data Analysis : t-Test, ANCOVA, Wolf's Formula.

- **Findings:**

- The Effect Size of the Programme was computed using Wolf's formula and was found to be 0.89, 1.03 and 0.91 for Developing an Identity, Managing Emotions and Resisting Peer Pressures and it was 0.65 for Building Relationships .

Details of Project 2 : Development of An Educational Programme for 'At Risk' Students from Low Socio-Economic Background and Testing Its Effectiveness.

Objectives:

(1) To identify students 'at risk' of failure in schools

(i.e. low achievers / probable drop outs) particularly those from low-income groups.

(2) To develop an educational programme for these students and test its effectiveness in terms of

- (a) imparting career awareness,
- (b) imparting job-related skills-computers
- (c) enhancing attendance and
- (d) attitude towards education

Independent Variable of the Study:

Educational Programme (Treatment)

- Creating a supportive and personalized learning environment.
- Providing students with more individualized attention, coaching and support.
- Including vocational subjects in the curricula along with academic subjects with the aim of imparting job-related skills to students so as to prevent drop-outs.

Dependent Variables of the Study:

1. Career Awareness
2. Awareness of vocational subjects- computer

3. Attitude towards Education
4. Attendance

• **Moderator Variables:** Socio-Economic Status

• **Control Variables**

- 1) Age
- 2) Gender
- 3) Types of institutions
- 4) Medium of instruction

- ***A student at risk is*** defined as students who have difficulty excelling in a standard classroom environment. Students are considered at-risk if they had one or more of the following characteristics:

- low socio-economic status
- from a single parent family
- an older sibling dropped out of school
- the students themselves changed schools two or more times
- had average grades of "C" or lower from sixth to eighth grade repeated a grade.

For the purpose of the study, Educational Programme is defined as a plan, which is developed for training students at-risk which include the following aspects...

- a. Providing career awareness
- b. Providing computers awareness

This programme was implemented using various interactive teaching methods such as discussion, case studies, power point presentations, showing educational video films and group work activities.

Methodology: Quasi experimental - pretest and posttest non-equivalent group design

O₁ X O₂ O₃ C O₄

Sample : 81 Student 38 in experimental group and 43 in control group

Treatment: Programme Developed and Implemented, The duration of conducting programme is **36 hrs spread over three weeks** using different interactive teaching methods including the pre and post testing in both experimental and control group.

Descriptive statistical analysis: Measure of Central Tendency, Measures of Deviation and Graphical Representation.

Inferential statistics: t Test, ANNOVA, and Wolf's Formula

Tools Prepared by the Researchers

Life Skills Questionnaire

Career Awareness Questionnaire

Computer Awareness Questionnaire

Ready made Tools Used

Socio-Economic Status Inventory (SESI) By Dr. Patel

Attitude towards Education Rating Scale By Vrinda Thombare.

Findings

Significant Difference was found in Experimental and Control Group.

Experimental group after treatment showed more progress than control group in the following variables...

- a. Career Awareness,
- b. Computer Awareness
- c. Attitude towards Education.

The Effect Size of the Career awareness was 0.59, Computer awareness was 2.94 and Attitude towards Education was 0.98.

Papers Published :

- “Enhancing Interpersonal Relationship Skills of Tribal Students Through a Personal Effectiveness Intervention Programme” Indian Journal of Applied Research. (**Kadu and Pandya**) **Second Author**
- “Developing Life Skills in Drop-Outs : An Experiment” Journal of Divergent Thinking. Vol. 1 No. 2, February 2013. pp.174-176. (**Dr. Shefali Pandya**) (**ISSN 2319-9431**)

- “Need of Life Skills for Tribal Students of Government Ashram School” Journal of Divergent Thinking. Vol. 1 No. 2, February 2013. pp.20-22. ((ISSN 2319-9431) **(Kadu and Pandya) Second Author**
- “Life Skill Training for Adolescent Students: An Urgent Need , National Conference on Life Skills Education January 23-24, 2014 Jointly Organized By S.P.Mandali’s Tilak College of Education, Pune. **Dr.Sudha Pingle**

Future Activities Proposed for Next 3 years...

- To organise as seminar on the two project-themes. (Rs. 2 Lakh)
- To publish books based on the present research (Rs. 2 Lakhs).
- To organize workshops to equip teachers in preventing drop-outs. (Rs. 2 Lakhs)
- To develop a short-term certificate course for teachers on “Capacity Building for Teachers of Under-Priviledged School Students.” (Rs. 65,000)
- **Further Research Topics:** (Rs. 10 Lakhs)

“Developing Career Oriented Skills in Marginalized Students : A Mixed Method Study”

“Transformative Life Skills Education for Marginalised Students”

Team :

1. Dr. Shefali Pandya
2. Dr. Satishkumar
3. Dr. Sunita Magre
4. Dr. Sudha Pingle
5. Dr. Priya Vaidya

11. CENTRE FOR REFORMS IN UNIVERSITY EDUCATION

This is a uniquely different centre from others under the UPE. The underlying idea was that while creating physical infrastructure in the University was important, equally or even more importantly it was necessary to create an ambience through provisioning of soft infrastructure. Thus this Centre addresses the lacunae that exist in the broad arena of governance.

As per the extant Act, University's top management comprises of the VC, Pro-VC and four statutory officers of equal rank, viz., Registrar, Director BCUD, Finance Accounts Officer and Controller of Examinations. These officers of the University are to drive the activities of the centre. The two service centres namely, the Press and the Central Computing Facility were also seen as important stakeholders in the process. The idea was thus to look at Administration, Exams, Academics and Finance (apart from CCF and Press) identify lacunae in the processes and try and simplify so as to transparently reduce the transactions cost. The felt needs so identified and addressed will thus form the thrust areas. Gaps where innovations were possible were also to be identified and addressed. The VC and the Pro-VC were to work as the drivers of the endeavors keeping in mind the overall vision for the furtherance of the goals of the University.

The work related to creating manuals and policies' regarding time table management for exams, affiliation of colleges, photocopy of answer books, revaluation work and on-line PhD entrance (PET) has been completed. The process of standardization of codes/ names of affiliated colleges and degrees apart from database regarding the non-teaching employees, protocol for communication process with colleges and manual for convocation process is well underway. The charting for action plan for holding of workshops for capacity building for RTf handling is complete and pilots have been conducted for a few officers. Ultimately when pilots in all the areas are conducted and scaled to the University level all the stake holders (students, faculty, non-teaching staff of the University and affiliated colleges are expected to benefit from the reduction of transactions costs (time and money) and efficiency gains.

12 CENTRE FOR GEO-INFORMATICS

The faculty members involved in the Centre for Geo-informatics have been actively engaged in acquiring of the knowledge of Geo-informatics by attending and participating in workshops and training programmes. They are also involved in dissemination of the knowledge of Geo-informatics by publishing and presenting papers employing remote sensing and GIS techniques and delivering lectures at different platforms. The report of the activities is as under:

A) Publications:

★ International:

1. **Jadhav,A.S.(2009):**” ‘Use of Remote Sensing in Land Use Monitoring’ Journal of Applied Science and Environmental Management, Port Harcourt, Vol.12, No.2, pp. 43-46.

★ National:

1. **Jadhav, A.S** and Ehsan Golmehar (2009) Current Application of Remote Sensing Techniques In Land Use Mapping: A Case Study of Northern Parts of Kolhapur District India , journal of Water and Land-Use Management, New Delhi. Vol.9, Issue 1-2, ISSN 0973-9300 Pp 107-114
2. **Jadhav, A. S.**, (2010) Role of Advanced Techniques in Resources Management with Special Reference to Remote Sensing and Geographical Information System: Some Reflections, Key note Address in Jadhav S.B. at al (Ed) Souvenir of UGC Sponsored National Level Seminar on Remote Sensing and Geographical Information System and its Application in Geography, Organised by MES’s Arts Commerce and Science College, **Jalna**, 8 & 9 March 2010, Pp.1-11.
3. Ram singh and Jadhav, A.S,(2013) Optimizing Land use, Geospatial Today, Hyderabad Vol.5,(2013),Pp.42-45 ISSN:0972-6810
4. **Dipti Mukherjee** ‘Spatial Behaviour and Resultant Cognitive Maps: An Empirical Study of Goawith GIS Approach’, **Proceedings of the International Conference on Perspectives of Perspective of Computer Confluence with Sciences 2012, (ICPCCS -12)**, Excel India Publishers, new Delhi,ISBN no. 078-93-82062-76-9, 376-384pp .

5. Dipti Mukherjee, Developmental Issues and Dynamics of Mumbai Cityscapes: Geoinformatic Inventory of F South Ward published by ICIARSGIS, International Conference on Interdisciplinary Applications, 2013,

B) Workshops Organised:

The Center has organized workshops/training programmes with collaboration of ESRI , NIIT India, ERDAS, ADCC Autocad, Aditi Infotech and geography department for the benefit of the members, college teachers and research scholars. These programmes were organized before procuring GIS software. Intensive training was provided by the companies.

In addition to training programmes workshops were organized for college teacher and research scholars on Geoinformatics and Remote Sensing.

C) Seminars organised:

1. Organised seminar on Spatial Dimensions on Health Care-Use of GIS in Health Studies, CEHAT and Dept of Geography, 24th September,2010.
2. Organized National Seminar on Earth Observation And Geoinformation Sciences for Environment and Sustainable development, Centre for Geoinformatics, University of Mumbai, Mumbai,7-9 Feb 2013

D) Papers presented:

1. **Jadhav, A. S.** (2010), Photogrammetry: Principles and Applications, presented in One day Workshop on Revised Syllabus at B.A. III, Mahavir Vidyalyaya, Kolhapur and Shivaji University, Kolhapur 10 October, 2010.
2. **Jadhav, A.S. and Shinde, S.D** (2010) Land Use Mapping in Parts of Western Maharashtra Based on Remote Sensing Techniques, Presented in National Seminar on GIS Application in Environmental Sciences and Geography, School of Earth Sciences, Swami Ramanand Thirth Marathwada University, Nanded. 29-30 October, 2010.
3. **Jadhav, A.S.** (2011), Global Warming with Special Reference to Indian Scenario, Presented in State Level Seminar on Environmental Issues, Krantiveer Vasantrya

Narayanrao Naik Shikshan Prasarak Sanstha's Arts, Commerce and Science College, Nashik, 21-22 January, 2011.

4. **Jadhav, A.S.** (2011), Planning and Management of Natural Resources, Valedictory address delivered at UGC Sponsored National Level Seminar on Planning and Management of Natural Resources, Milind College of Arts, Aurangabad, 20-21 January, 2011.
5. **Jadhav, A.S.** (2011), Impact of Globalization on Indian Agriculture: Perspective and Challenges, Keynote address delivered at UGC Sponsored State Level Seminar on Impact of Globalization on Indian Agriculture: Perspective and Challenges, Sau Rajanitai Deshmukh Arts, Commerce and Science College, Bhadgaon, Dist. Jalgaon, 12-13 Feb., 2011.
6. **Jadhav, A.S.** (2011), Remote Sensing: A Modern Tool, Presented Paper a paper as resource person in UGC Sponsored National Seminar on Application of GIS Techniques in Geography, Changu Kana Thakur Arts, Commerce and Science College, New Panvel, 11-12 Feb., 2011.
7. **Jadhav, A.S.** (2011) Chaired Technical Session IX at National Conference on Population Resources and Environment, Department of Geography, Aligarh Muslim University, Aligarh, 1-2 March, 2011.
8. Paper presented on **'Spatial Behaviour and Resultant Cognitive Maps: An Empirical Study of Goa with GIS Approach'** at the conference on Perspective of Computer Confluence with Sciences, 2012, December 10-12, 2012, Organised by Nowrosjee Wadia College, Pune.
9. Paper presented on **Developmental Issues and Dynamics of Mumbai Cityscapes: Geoinformatic Inventory of F South Ward** at ICIARSGIS, International Conference on Interdisciplinary Applications of Remote Sensing and Geographic Information Systems, K. J. Somaiya College of Arts, Science and Commerce, Mumbai, 26 - 27, April 2013,
10. **Mukherji, Dipti (2010) 'Role of GIS in Healthcare Management'**, seminar on Spatial Dimensions on Health Care-Use of GIS in Health Studies, organised by CEHAT and Dept. of Geography, Dept of Geography, 24th September, 2010.

11. **Mukherji, Dipti** (2010) Present a theme paper on ‘GIS in Disaster Management’, MEMEX 2010, presented 10th December, 2010, Marshall Hall, J.N. library, University of Mumbai
12. **Mukherji, Dipti** (2010) Presented paper on ‘Geographical Information System for Postal Service of a City’, National Seminar on Dynamics of Cities and City-Regions: Development Strategies and Environmental Issues in Contemporary India, organised at Department of Geography, University of Mumbai.
13. Paper presented on ‘Assessment of Social Infrastructure in Transforming Mills Areas of Mumbai : A Geographical Inquiry’ at 33rd INCA International Conference by Dipti Mukherji and Prasad Gogate, Jodhpur , 19-21 September, 2013.
14. Paper presented on ‘Disaster Information System for Mitigation and Management –Greater Mumbai Case Study’ at 33rd INCA International Conference by Dipti Mukherji and B. B. Sonule, Jodhpur, 19-21 September, 2013.
15. **Srivastava, S and Kaur Narinder**:(2010) “The Status of Forests in City-Regions: A Case Study of the Forests of Thane” presented at National Seminar on “Dynamics of Cities and City- Regions: Development Strategies and Environmental Issues in Contemporary India” organized at the Dept. of Geography and BGA, Jan 20-22, 2010, in Vidyanagari Campus, University of Mumbai. The paper being published in book by Rawat Publications
16. **Srivastava, S.:(2010) “Declining Biotic Cover and Strategies for Conservation”** present lead paper in session on ‘*Resource Degradation and Environmental Pollution*’ at National Seminar on “Population, Development and Environment: Issues and Challenges” organized by the Dept. of Geography, Banaras Hindu University, Varanasi, Feb 18-20, 2010. Above paper being published in book by Dept. of Geography, BHU.
17. **Srivastava, S. and Mukherji, D.(2010): “Heritage Structures and Changing Environment”** paper presented at Vastu Shastra National Conference, at Mavalankar Auditorium, New Delhi, on July 22-24, 2010 organised by Vastu Sadan and Kashi Hindu Vishwavidyalaya, BHU.

E) Workshops Attended:

Dr A.S. Jadhav and Dr Dipti Mukherji attended below mentioned International Workshop to update knowledge of advanced Geospatial Technology:

1. Workshop on GIS technology and Applications: Geospatial Information for Developing Countries organised by Department of Computer science and Engineering, IIT Bombay and Department of Computer science and Engineering, University of Minnesota, USA and Sponsored by Indo-US Technology Forum (IUSSTF), 16-18 December, 2009.

F) Lectures delivered:

➤ **Dr A. S. Jadhav:**

- 1) Delivered a Series of 5 lectures on Principles of Remote Sensing, Image Processing, Aerial Photo- interpretation, False Colour Composite (FCC) Interpretation and Geographical Information System at Department of Geography, Aligarh Muslim University, **Aligarh**, 19 -20 March, 2010.
- 2) Delivered Lecture on Remote Sensing, Refresher Course organized by Academic Staff college, Sant Gadage Baba University, **Amravati**. 14-10-2010
- 3) Delivered two lectures on Principles of Remote Sensing and Applications in Geography' in Department of geography, Dharwad University, **Dharwad**, 24-3-2011
- 4) Delivered two lectures on Remote Sensing Applications in Geography' in University of Pune, **Pune**, 9-5-2011.
- 5) Delivered Lecture as Resource person for Workshop on 'Application of Quantification Techniques in social Science Research' for Degree College Geography teacher and Research Scholars by Dept. Geography, university of Mumbai, **Mumbai**, 19-23 July, 2010.
- 6) Delivered Lecture as Resource Person at ' A Preparation Guidance Workshop for SET and NET Candidates, organized by Dept. of Geography, University of Mumbai, **Mumbai**, 24tNovember 2010

- 7) Delivered lecture on ‘New Dimension in Human Geography -- Induction of Spatial Information Technology’, 15th February,2013 for refresher course on “Emerging Issues in Geography”, Organised by Department of Geography and Academic Staff College, University of Pune, 11 February ,2013 to 2nd March,2013 .
- 8) Delivered lecture on ‘Dynamics GIS for Spatial Data Analysis in Socioeconomic Studies : Some Archetype’, 15th February,2013 for refresher course on “Emerging Issues in Geography”, Organised by Department of Geography and Academic Staff College, University of Pune, 11 February ,2013 to 2nd March,2013 .
- 9) Delivered lecture on ‘Dynamics GIS for Multidimensional Spatial Data Analysis for Decision Making and Interactive mapping: Some Archetype’ for National Seminar on ‘Geo-Spectrum: Towards New Frontier’ on Tuesday 26th February 2013 Ruia College, Mumbai

➤ **Dr. Sudha Srivastava**

- 1) Delivered the **Valedictory Address** at the National seminar on ‘Application of GIS Technique in Geography’ Feb 11, 12, 2011 at CK Thakur Arts, Commerce and Science College, New Panvel
- 2) Delivered special session (10.30 a.m.-1.30 p.m.) on “**Coastal Environment: A Study through Maps, Charts and Images**” at Central Institute for Fisheries Education for their CAFT training program on ‘Advanced Analytical Techniques for Aquatic Environment’ on March 1, 2011.

Centre has stated the procedure of procuring the equipment recommended by the committee by inviting the quotation following university rules. Within two months the completely well equipped laboratory for GIS and Remote Sensing will be ready.

The centre has started the process of getting approval to the course structure and syllabi to be prescribed to M.Sc. Soon the necessary approval of relevant university authorities will be obtained to introduce Ph.D. degree through the centre. Both M.Sc. and Ph.D. (Geo informatics) will be started after obtaining necessary sanctions of authority by academic year 2013-2014.

The centre is committed to disseminate the knowledge of Geoinformatics by organizing workshops, trainings' and conferences. Data collection regarding the major project has started and images of the Mumbai city will be procured soon.

13. DIGITAL KNOWLEDGE CENTRE

➤ **Objectives:**

Digital Knowledge Centre, one of the ambitious projects under UPE, is aimed towards creation of repository of intellectual publications of faculties and research scholars of University of Mumbai. The major objective of the project is to make accessible the scholarly publications of University of Mumbai to its clientele and digital preservation of the scholarly resources

➤ **Details of work carried out under the project:**

An Open source software is installed on two PC's in the Department of Library and Information Science and the project was initiated with a pilot study of 500 theses from the library collection in the subject of Life Science, Political Science, Linguistics, Microbiology, Management, Philosophy, Psychology, Sociology. The Table of Content and Synopsis of theses are digitized and uploaded on the DSpace software by assigning standard metadata for information retrieval. The same is made accessible through University Website. The success of the Pilot study, led to continuation of the digitization of other available theses and dissertations in the library.

We have so far digitized 3121 theses and dissertations, 60+ Convocation Addresses of University of Mumbai and 50+ Faculty Publications.

It is proposed to include full text of faculty publications, and some specialized publications of the University in this repository in near future. It is expected that faculty members, students of the university and the research scholars will greatly benefit from this project as contents of the knowledge repository will be uploaded on university website from time to time.

The DKC committee members strongly recommend that, in order to pick up the progress of the project, the total budget allocation should be re-appropriated under more specific heads to include improvement in infrastructural facilities, visits, conducting conferences, AMC, software development etc. Considering the nature of the project, there is an urgent need to appoint technically qualified personnel and

Professional Assistants with higher remuneration (at least 7 more), in addition to currently employed ones.

✓ **Future Plan**

It is being planned that new recruitment will be made in DKC. The work of digitization of theses and dissertation will be undertaken. In the later stage, the digitization of University Calendar/ Annual Reports, old Convocation addresses and other University Publications will be undertaken by the DKC.

14. INTERNATIONAL STUDENTS' HOSTEL & GUEST HOUSE

The students' hostels and guest house construction has started on the Vidyanagari campus of the University and presently first phaser is complete. There was a procedural delay (including the permission from the Brihan Mumbai Municipal Corporation (BMC) in starting the construction of the building. However it is likely to be completed by the end of this financial year 2015 – 16.

Annexure 7

Externally funded Research Projects

- International organizations like European Commission: Rs. 3.5 crore, British Columbia Govt.: Rs. 0.44 crore, Peoples Republic of China: Rs. 0.75 crore, US Army to Dept. of Chemistry: Rs. 0.16 crore.
- UGC XII plan Rs.11 Crores for a state of art library building at Vidyanagari campus.
- Partnership with the Industry : Rs. 4.20 crore from Tata Consultancy Services Ltd. for restoration of Rajabai Tower, Rs. 2.0 crore from the Indian Merchant Chamber for Chair in Finance, Reliance Industries Ltd.: Rs. 0.70 crore, Reserve Bank of India for RBI Chair: Rs. 2.0 crores, HCCB Ltd.: Rs. 0.28 crore
- Contribution received from UGC, DST, Govt. etc.
 - UGC : Rs.10.02 crore
 - DAE/BRNS : Rs. 0.33 crore
 - DST : Rs. 0.19 crore
 - DBT : Rs. 0.24 crore
 - Inter University Accelerator Center : Rs.0.03 crore
 - Indian Academy of Sciences : Rs. 0.033 crore
 - Planning Commission : Rs. 0.16 crore
 - State Govt. for Synthetic Athletics Track : Rs. 3.16 crore
 - State Govt. for Women's Hostel : Rs. 10.00 crore
 - State Govt. for Indian History Congress : Rs. 2.00 crore
 - State & Central Govt. for Model Colleges : Rs. 16.00 crore
 - State Govt. has committed Rs. 100.00 crore for International Convention Center

Some Specific Individual Projects from Science Departments

DEPARTMENT OF CHEMISTRY

Name of the Investigator	Title of the project and duration	Amount sanctioned (Rs)	Funding Agency
Dr. B. H. Mehta	Environmental accumulation and transfer factor of radionuclides, elements released from nuclear facilities	16,18,950	Board of research in nuclear science (B.R.N.S)

	at Tarapur site. 2007-2010		
Dr. A. V. Karnik	Development of C ₂ symmetric hetero-helicenes as fluorescent chiral sensor for amines and amino esters. 2008-2011	28,42,800	Department of Science and Technology(DST),
Dr. (Mrs.) M. A. Karve	Solid Phase extraction methodologies for heavy metal removal 2008-2011	6,43,000	UGC
Dr. V. R. Patil	Synthesis and Studies of Water-Soluble Polyesters Containing Ethylenediaminetetraacetic acid and Their Metal Complexes 2010-12	1,10,000/-	UGC, Delhi
Dr. V. R. Patil	Stable Blue Light Emitting Polyfluorene Containing Diphenylanthracene and Terphenyl-based Light Emitting Diodes 2013-16	17,00,000/-	DST, Delhi
Dr. A K Srivastava	Supramolecular interactions based nanoscale electrochemical sensors for certain metal ions of nuclear technological importance	18,00,000/-	DAE - BRNS
Dr. A K Srivastava	Development of Electrochemical Sensors	USD 24,000/-	US Army Research
Dr. A K Srivastava	Studies on high energy density reactions reactions for development of nanostructured hybrid 2012 - 2013 supercapacitors	USD 33,800/-	US Army Research
Department of Chemistry	DST FIST	124.50 Lakhs	DST

Department of Chemistry	UGC-SAP	47.25 Lakhs	UGC
Department of Chemistry	UGC-SAP	75.00 Lakhs	UGC

DEPARTMENT OF BIOPHYSICS

- a) Studies on oxidative stress of various cancer patients undergo Chemotherapy and Radiotherapy and to evaluate those as surrogate markers for immediate clinical response. **Sponsor Agency:** Department of Atomic Energy, Board of Nuclear Sciences & Research, Govt of India, (DAE-BRNS) **Collaborator:** Chief Division of Oncology, Dr Balabhai Nanavati Hospital, Mumbai.

Principle Investigator: Dr P M Dongre, Department of Biophysics
 Period 2008-2009 to 2009-2010
 Amount: Rs. 12,07,450/-

- b) Development of Bioinformatics database for Radiomodifiers and make available through internet to user community; **Sponsor Agency:** DAE-BRNS

Principle Investigator: Dr P M Dongre
 Period: 2009-2010; 2010-11, 2011-12
 Amount Rs: 7,96,900/-

Annexure 8

Infrastructure

Details of Green Technology Building:

Total area 14,000 sq. ft.

Sr.No.	Description	Size (m)	Area (Sq m)	Capacity (nos.)	No. of rooms	Total Capacity
1	Ground Floor					
i	Seminar hall	34 x 11.23	381.82	304	1	304
ii	Administration	6.8 x 5.5	37.40	10	1	10
2	Mezzanine					
i	Administration	9.6 x 5.5	52.80	12	1	12
3	First Floor					
i	Lab Type-1	8 x 11.23	89.84	24	2	48
ii	Lab Type-2	11.23 x 11.23	126.11	36	2	72
iii	Classroom	5.5 x 6.2	34.10	24	1	24
iv	Faculty Room	2.8 x 3.6	10.08	1	9	9
4	Second Floor					
i	Lab Type-1	8 x 11.23	89.60	24	2	48
ii	Lab Type-2	11.23 x 11.23	126.11	36	2	72
iii	Classroom	5.5 x 6.2	34.10	24	1	24
iv	Faculty Room	2.8 x 3.6	10.08	1	9	9

Annexure 9

Courses

Development of Academic Programmes.

- i) Credit Base Systems are introduced for Under Graduate Level.
- ii) 155 Under Graduate Syllabi have been redeveloped.

Following new Courses started Since 2010

1. M.A.(Honours) in Politics.
2. One Year Part-Time Post Graduate Diploma in Advertising and Media (Garware Institute).
3. One Year Part-Time Post Graduate Diploma in Business Management (Garware Institute)
4. Certificate Course in Mass Media in Hindi.
5. Diploma Course in Mass Media in Hindi
6. Certificate Course in Computerized Accounting and Tally Package
7. Certificate Course in 'Philosophy of Communal Harmony Social Peace'
8. Certificate Course in 'Indian Aesthetics'
9. Post-Graduate Diploma Course in Women's Studies
10. Post-Graduate Diploma Course in Public Policy
11. Post-Graduate Diploma Course in Environment and Development.
12. Post Graduate Diploma Course in Mysticism
13. Post Graduate Advance Diploma Course in Mysticism
14. Certificate Course in Puppetry
15. Diploma Course in Buddhist Studies.

16. Diploma Course in Jewellery Designing Management
17. Certificate Course in Introduction to Computer Reservation System
18. Certificate Course in Agri-Tourism.
19. Diploma in Epigraphy.
21. Diploma Programme in Agriculture and Business
22. Certificate Course in Ancient Indian Culture.
23. Diploma in Indian Numismatics.
24. Certificate Course in Geology.
25. Post Graduate Diploma in Clinical Studies, data Management and Medical Writing.
26. Post Graduate Advanced Diploma in Pali.
27. 1. B.A./B.Sc. (Human Sciences)
28. 2. B.A. (Film, TV and New Media Production)
29. 3. B.A. (Culinary Arts)
30. 4. M.A. (Business Economics)
31. 5. M.A. (TV and New Media Productions)
32. 6. M.A. (Entertainment, Media and Advertising)
33. 1. B.A./B.Sc.(Human Sciences)
34. 2. B.Sc.(Inter-disciplinary)
35. 3. M.Sc. (Renewable Energy)
36. 4. M.Sc. (Biodiversity and Wildlife Conservation and Management)
37. 5. M.Sc.(Hotel and Hospitality Administration)
38. 1 B.Com. (Financial Management)
39. 2. B.Com. (Investment Management)
40. 3. B.Com. (Transport Management)

41. 4. B.Com./B.M.S. (Environmental Management and Economics)
42. 5. M.M.S. (Pharma and Healthcare Management)
43. [D] N.C.C. Studies/NSS/Sports(Optional for Foundation course in B.A., B.Com., B.Sc.)
44. B.E.(Mechatronics Engineering)
45. B.E.(Electronics and Electrical Engineering)
46. M.E.(Mechanical Engineering –Product Design & Development)
47. M.E. (Mechanical Engineering – Energy System & Management)
48. M.E. (Electrical Engineering - Power Plant Engineering & Energy Management)
49. M.E. (Civil Engineering - Construction Engineering & Management)
- M.E.(Signal Processing)
50. M.E.(Advance Communication &Information System)
51. M.E.(Computer Network &Information Security)
52. M.E.(Packaging Technology)

ANNEXURE 10

Industry collaboration

1. MoU with I.M.C. for the Institution of the I.M.C. Pravinchandra Gandhi Chair on Banking and finance
2. MoU with Reserve Bank of India.
3. MOU with Hindustan Coca-Cola Beverages Pvt. Ltd. (Sales Management/Retail training.)(Smart Course)
4. MoU with CSIR National Institute of Oceanography Dona Paula, Goa
5. MoU with Indian Air Force University Department of African Studies

ANNEXURE 11

International Collaborations

MOU/Agreement with Foreign Universities and other organizations

- Collaboration MoU with University of Picardy Jules Verne, France
- MoU with I.M.C. for the Institution of the I.M.C. Pravinchandra Gandhi Chair on Banking and finance
- MoU with Reserve Bank of India.
- MoU with Edith Cowan University (Australia)
- MoU with Tainjin University of Technology (People's Republic of China)
- MoU with Tainjin Normal University
- MoU with between University of Mumbai and Nankai University.
- MoU with between Deakin University (Deakin), Australia and University of Mumbai India.
- MOU with Hindustan Coca-Cola Beverages Pvt. Ltd. (Sales Management/Retail training.) (Smart Course)
- MOU with University of Hawai'i system Kapi'olani Community College Hawai'i.
- MoU with The Board of Trustees of the University of Illinois, USA.
- MoU with Confucius Headquarters of China on the Establishment of Confucius Institute
- MoU with CSIR National Institute of Oceanography Dona Paula, Goa
- Agreement for Cooperation with University of Paris
- Agreement for Cooperation with University of Gottingen, Germany
- MoU with Indian Air Force University Department of African Studies

Department of Physics

National Collaborations

- Indian Institute of Science, Bangalore
- Tata Institute of Fundamental Research (TIFR)
- Indian Institute of Technology (IIT), Bombay
- UGC-DAE-CSR at Indore, Mumbai and Kolkata Centers
- Bhabha Atomic Research Centre (BARC)
- Inter-University Accelerator Center, New Delhi
- Sophisticated Analytical Instrumental Facility (SAIF)- IIT, Bombay
- Indian Institute of Geomagnetism (IIG), New Mumbai
- Materials Science Research Laboratory, Dept. of Physics, J.C.D.A.V College Dasuya, India.

International

- NIKHEF Theory Group, Netherlands
- Institut Curie, Centre de Recherche, CRNS UMR 168, Paris Cedex 05, FRANCE.
- University of Trento, Italy
- Russian Academy of Sciences , Russia
- University of Seoul, South Korea
- King Abdulha University of Science and Technology Saudi Arabia (KAUST)
- Hanyang University Seoul , south Korea

Department of Chemistry:

International

- US Army Research Laboratory, Aberdeen, Mary Land USA

Department of German

1. Collaboration – National, international during current phase

a.) The Department of German signed an MOU with the University of Göttingen in 2013. There has been an ongoing project on “Multilingualism” with the Universities of Göttingen and Pune under the German Institutes’ Partnership (GIP). A publication on the volume on Concepts and Context of Multilingualism is expected soon.

b.) With the University of Hamburg two projects have taken place:

(i) Under the aegis of “A New Passage to India” financed by the German Academic Exchange Service (DAAD) and the German Federal Ministry of Education and Research the project titled “Harbour Cities as Intercultural Topos: Mumbai and Hamburg in Comparative Media Studies” between the Department of German and the Institute of German Studies, University of Hamburg was completed. 12 German research scholars visited the Department of German in February 2011 and 2012 for four weeks and eight research

scholars and post-graduate students of the Mumbai University Department of German spent eight weeks in 2011 and 2012 at the University of Hamburg for research and language courses. A publication of the findings will be published soon.

(ii) Under the DAAD-UGC “Project based Personnel Exchange Programme (PPP)

Prof. Dr. Vibha Surana and Dr. Meher Bhoot carried out the project on “Semantics of Maritime Urbanity, Harbour Cities Hamburg and Mumbai” with Prof. Dr. Ortrud Gutjahr from the University of Hamburg.

c.) In December 2014 the Department of German celebrated 100 years of German Studies at the University of Mumbai. In order to commemorate this event the Department collaborated with the International Association of Intercultural German Studies (GiG) for the international conference on “Comparative Aesthetics”.

Department of Philosophy

Collaboration- National International during the current phase

i.MOU with St. Paul’s University, Ottawa Canada for academic collaborations

ii.Collaboration with ICSSR on an International Workshop on ‘Contemporary Political Theory’

iii.Collaboration with the ICPR on several research activities.

iv.Collaboration with the University of Hyderabad on the UGC’s EPathshala programme.

Department of Sociology

National and International Collaboration

a) Faculty-Student exchange programme with University of Magdeburg, Germany.

b) Research collaboration with Plymouth University, UK

c) Research collaboration with selected universities in BRICS nations

Annexure 12

Patents

Patents filed/obtained during the current phase:

S. No	Name of Invention	Patent Number/Application no.
1	A process for highly dispersed nanoclay	260237 (526/MUM/2009)
2	The novel oxalate ceramic method for the synthesis and production of spinel ferrites	3257/MUM/2011
3	The Novel Oxalate Ceramic Method for the synthesis and production of spinel ferrites	Indian Patent applied no.: 3257/mum/2011
4	A Process of Ultrasonic Cavitation Technique for Synthesis of Polymer Nanoparticles	36/MUM/2012
5	Controlled Synthesis of Inorganic/Hydroxide Nanoparticles Using Continuous Ultrasonic Cavitation Technique	1671/MUM/2012
6	Solvent free process for oxidation of alcohols to carbonyl compounds	Indian Pat. Appl. (2012), IN 2011MU00361 A 20120817
7	Process for the preparation of pharmaceutically active valsartan and its intermediates	Indian Pat. Appl. (2012), IN 2011MU00362 A 20120817,
8	A high-throughput process for the preparation of pharmaceutically active valsartan and its intermediates	Indian Pat. Appl. (2012), IN 2011MU00371 A 20120817,
9	A process for the preparation of valsartan	Indian Pat. Appl. (2012), IN 2011MU00372 A 20120817
10	An apparatus for the continuous synthesis of carbon nanomaterials	3179/MUM/2013
11	Process for preparation of oxo-containing macrocyclic and macrocyclic aromatic compounds	Indian Pat. Appl. (2013), IN 2010MU02377 A 20130906
12	Synthesis of 4-alkylcalix[n]arenes in presence of alumina supported KF under microwave irradiation	Indian Pat. Appl. (2013), IN 2010MU03469 A 20130628

13	Synthesis of 4-alkylcalix[n]arenes in presence of alumina supported KF under microwave irradiation	Indian Pat. Appl. (2013), IN 2010MU03470 A 20130628
14	Synthesis of 4-tert-butylcalix[n]arenes having phenyl substituents on methylene bridges	Indian Pat. Appl. (2013), IN 2010MU03471 A 20130628
15	Microwave assisted synthesis of 4-tert-butylcalix[n]arenes having phenyl substituents on methylene bridges Microwave assisted synthesis of 4-tert-butylcalix[n]arenes having phenyl substituents on methylene bridges	Indian Pat. Appl. (2013), IN 2010MU03472 A 20130628
16	Microwave assisted synthesis of 4-tert-butylcalix[n]arenes having phenyl substituents on methylene bridges in presence of alumina supported KF under solvent free conditions	Indian Pat. Appl. (2013), IN 2010MU03473 A 20130628
17	Synthesis of low temperature ferrocene containing liquid crystalline materials	Indian Pat. Appl. (2014), IN 2013MU00216 A 20141031

Annexure 13

Academic Reforms

Promote Autonomy

In Jurisdiction of University of Mumbai, there are 52 colleges which have been graded „A“ by NAAC, to groom this autonomy campaign the University of Mumbai has organized this creative Programme.

Academic Audit

For the first time, University of Mumbai conducted academic Audit of Affiliated colleges, The audit will assess colleges on several parameters based on performances of students in University exams, student achievements etc, it will also consider the number of students whose scores have been scaled down in the last academic session. This will be to check if colleges have been liberal in giving internal marks, colleges will be assessed on parameters that are different from the NAAC norms, MU will launch the project in phases, starting with 50 colleges this year.

Summer School

To promote innovation and research skill among students, University of Mumbai had started Summer school.

Departmentwise Academic Reforms

Sociology

a) Teaching-Learning Process:

A marked shift away from classroom style teaching to discursive pedagogy wherein the students are provided with reading material ahead of the contact hours and the classes are in the form of discussions based on the reading.

Student presentations have become integral part of the contact hours.

b) Examinations: 40% of marks are now earmarked for continuous assessment system in every paper wherein the students writes an assignment which is evaluated in a viva-voce examination attended by a panel of three members of the faculty. Rest of the 60% marks are for the conventional written examination.

Department of Philosophy

1. Academic reforms introduced during the current phase
 - i. Project work and text study with the Masters credit-based semester system syllabus.
 - ii. Interdisciplinary courses and papers in emerging areas.

- iii. The Department initiated a publication series on the teacher-philosophers who initiated interest in the discipline in Mumbai (such as Dr. Ookerjee, Prof. Kulkarni) during its seminal period, on seminar proceedings (Indian Aesthetics Seminar proceedings) and on topics that interest individual faculty authors (such as ‘Jyotiba Pule: A Modern Indian Philosopher’) (List available in the Department).
- iv. The Department has initiated Book Release/Book Review programmes each year (on Teacher’s Day normally) to communicate published work to the philosophical and other academic communities.
- v. The Department annually celebrates the World Philosophy Day (which is Socrates’ birthday).
- vi. The Department holds monthly meetings of the Bombay Philosophical Society which is a research forum for college and university teachers, research scholars and students.
- vii. The Department faculty have initiated several student study circles for interactive discussions on disciplinary and interdisciplinary academic matters.
- viii. The Department has initiated a faculty discussion group ‘Nous Circle’ for teachers to discuss research papers that are outside their specializations.
- ix. The Department offers extension programme courses in different areas of philosophy (Jainism, Buddhism, Yoga, Indian Aesthetics and Vallabh Vedanta).
- x. The Department is committed to remembering the legacy of philosophy in Mumbai with the D’Andrade Memorial Lecture (ongoing at the BPS), the Prof. Kulkarni Seminar (conducted once) and the Dr. Ookerjee Memorial Seminar (ongoing).
- xi. The Department collaborates with other Departments, local colleges, national and international institutions in research work.
- xii. Three faculty members from colleges are research guides in the Department.
- xiii. The Department initiated research activities in Buddhism under Buddhist Studies New Initiatives.
- xiv. Students have been encouraged to actively participate in Seminars/Workshops/Talks as a part of their project work for the credit-based semester system.

Department of German

A major reform has been the transfer and recognition of credits in the programme M.A. (Hons.) in German Studies. Credits of German students, who study at the Department of

German, University of Mumbai are already being awarded and recognized by the Georg-August University of Göttingen. Now students of the University Department of German can study a semester at the University of Göttingen and get their credits recognized and transferred here.

The Department has a GIP partnership with the University of Göttingen, Germany and University of Pune for the project on “Multilingualism”. Research and post-graduate students have received scholarships for a semester in Göttingen, Germany funded by the German Academic Exchange Service (DAAD). Students were also awarded other scholarships like the Erasmus Mundus programme.

Post-graduate students have been actively involved in the Departmental Projects. For instance they were also sent to the University of Hamburg for the project “Harbour Cities as Intercultural Topos: Mumbai and Hamburg in Comparative Media Studies” under the aegis of New Passage to India.

The syllabus of part time courses has been optimized to correspond with the European Reference Framework, in which language course levels have been internationally structured and systematized. The courses are communicative based and use state-of the art methods of learning and teaching.

Department of English

Academic Reforms introduced

- (i) Updated and systematized Remedial Programme for disadvantaged students
- (ii) Peer teaching
- (iii) Periodic Workshops for students by visiting Professors
- (iv) Guidance/mentorship of students for publishing of research papers in academic journals
- (v) Guidance/mentorship of students to present conference papers at national/international fora

Annexure 14

Community reach, Extension and Outreach Activities undertaken during current Phase.

Centre for Computational Social Sciences

- Experiments conducted in Mahabaleshwar, Tetli in order to test some hypotheses about Elinor Ostrom's framework on conservation of common pool resources. The experiments consisted of a well known of the appropriation game from Ostrom (2006). Some flaws in the design were detected and hence a new version is planned in August.
- Public goods, ultimatum and trust games conducted at Nagewadi, Dist. Satara. The objective is to test the role of caste groups in achieving coordination in solving collective problems. The results were interesting and the first draft of the paper is being written up.
- An MoU has been signed with Messrs Maxus , a leading media research company to explore the possibilities of using insights from behavioural economics into managerial decision making and in particular into media planning. A set of six to eight video films is being planned to convey the basic ideas to the general audience. The scripts have been written and the production of the videos is being undertaken.
- One four day workshop, one three day workshop, one 1 week workshop, and three one day workshops have been held from May to July 2014. The workshops familiarised the participants with use of NSSO consumption expenditure data, use of basic statistical methods in social sciences, basic concepts in behavioural economics and evolutionary psychology and use of software for experimental research.

Department of Physics

- Department has taken initiative in starting Mumbai Area Physics Meet which is a group of major research centres in the city of Mumbai- TIFR, IIT, BARC, University Department and the UMADE-CBS. The first event under this was hosted by department. The aim is to establish connection between research centres and colleges
- Science Day program every year
- I Love Physics program
- NET Coaching Sessions
- Linux workshop(June 2015)
- Skill India program for underprivileged youth (June 2015)

Other Activities

- Establishment of Model Colleges at low GER districts, Ratnagiri and Sindhudurg.
- Soft Skills Training for students with rural background.
- Yuva Diwas on 12th January, birth anniversary of Swami Vivekanand
- Bhajan Sandhya on birth anniversary of Mahatma Gandhi.
- Community college in Thane- Kalwa
- Aid for Hailstorm farmers and flood victims in Jammu and Kashmir
- 2 days Round Table Conference on Media Education
- Enlighten yourself every Saturday (EYES) lecture series has been organized.