

# Doctoral Studies in Faculty of Science in Annamalai University

**DR. S. RAVI**

Professor & Head, Library and Information Science Wing, DDE, Annamalai University

**V. MOHAN**

Technical Officer, Library & Documentation, Central Marine Fisheries Research Institute, Cochin-18.

and.

**P. SRINIVASARAGAVAN, L. MOHAN, UMAR & M.G. SATYAMOORTY**

DLIS, Annamalai University, Annamalai Nagar - 608002

## ABSTRACT

*This study investigates the rates of successful doctorates awarded in the faculty of Science at Annamalai University in the fields of marine biology, physics, chemistry, botany, zoology, biochemistry, maths, statistics and geology. The distribution of Ph.D theses analyzed during the period of 2001-2005. This study led to increase the research activity at various in-depth applied researches in future. An analysis of the data revealed that the rates of differences between the subjects as a whole. Pertinent to this study provides statistics of doctoral research awarded in the faculty of science at Annamalai University and analyzed chronologically, sub-fieldwise participation rates by the guides and genderwise.*

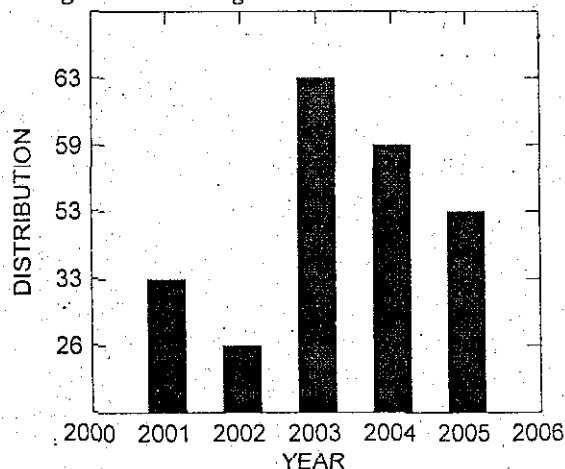
## INTRODUCTION

The contribution of science in a developing country has to be seen in a larger context than merely in terms of Ph.D research programmes as a consequence of rapid development in science; there is a virtual information explosion the world over. For achieving an optimal utilization of these developments it's essential that the academicians have been made significant achievements in the field of science and technology over the years in India. Doctoral studies comprise one subset of academic carrier advancement it has not received a great deal of attention in scholarly productivity of good researchers in developing countries. Since, the quantitative measures of output often figure in decision an academic promotions and tenure. Secondly Professor Subramanian, VC of Tamil University, Tanjore pointed out those 1.35 lakh of students enrolled to do the higher education for the year 2004-2005 and 25,925 (20%) of the students entered into PG Programmes. He also reveals that 1% of the students' only turn into the research programmes (PhDs).

Keeping in view of the Ph.D. research system in the faculty of science, constraints, limitations and information requirements at different levels to be identified and

effectively formulating a comprehensive applied and basic research in India. For the above purpose such a study will help to define a vision for the researchers as producers and consumers of information, have to create awareness of research in the field of science in India. The objectives of this study 234 doctoral and one Post Doctoral theses were taken for analyses from Annamalai University in the faculty of science in nine disciplines during 2001-2005.

**Fig. 1 – Chronological distribution of theses**



**Table 1 - Yearwise distribution of theses during the periods**

Sl. No.	Year	Distribution of theses	Percentage	Cumulative distribution	Cumulative Percentage	Rank
1	2001	33	14.10	33	14.10	IV <sup>th</sup>
2	2002	26	11.11	59	25.21	V <sup>th</sup>
3	2003	63	26.92	122	52.14	I <sup>st</sup>
4	2004	59	25.21	181	77.35	II <sup>nd</sup>
5	2005	53	22.65	234	100	III <sup>rd</sup>

The Fig 1 shows that chronological distribution of Ph.D theses; in 2003 the distribution rate was very high and very low in 2002. When compare with 2002, the rates of distribution were increased tremendously in 2003 and suddenly decreasing the rates in 2004 and 2005 was identified.

**SUBJECTWISE DISTRIBUTION OF THESES**

First, difference between the subjects might figure and the distribution rate shows distinct trends among these disciplines. The Marine Biology (24.79%) has the greatest rates of the distribution and followed by Chemistry (10.80%), Physics (14.53%), Botany (13.68%) and 10.26%

distribution in Zoology. Since the Mathematics department has included in this faculty in 1929 the rate of productivity was 6.84% when compare with Maths, the Biochemistry started in 1984+, the then disciplines was in better position i.e. 5.96% during this periods. The Geology department was produced 3.85% of theses and followed by the Statistics (1.28%) were observed

**SUBFIELDWISE DISTRIBUTION**

From these data (Appendix I and 1a) we can learnt that there has been ironically decline in scientific productivity coincides with enhanced inputs into science research; while sub-fieldwise distribution of PhDs awarded in this

**Table 2 - Subject wise distribution of theses**

Sl. No.	Subjects	Year					Total	Percentage	Cumulative Total	Cumulative Percentage	Rank
		2001	2002	2003	2004	2005					
1	Marine Biology	7	8	20	14	9	58	24.79	58	24.79	I
2	Physics	5	2	11	7	9	34	14.53	92	39.32	III
3	Chemistry	3	5	13	16	7	44	18.80	136	58.12	II
4	Botany	8	6	8	4	6	32	13.68	168	71.79	IV
5	Zoology	6	1	3	7	7	24	10.26	192	82.05	V
6	Biochemistry	1	--	3	4	6	14	5.98	206	88.03	VII
7	Mathematics	1	3	3	1	8	16	6.84	222	94.87	VI
8	Statistics	--	1	1	1	--	3	1.28	225	96.15	IX
9	Geology	2	--	1	5	1	9	3.85	234	100	VIII

faculty toxicological study was the highest rate among the total population were identified.

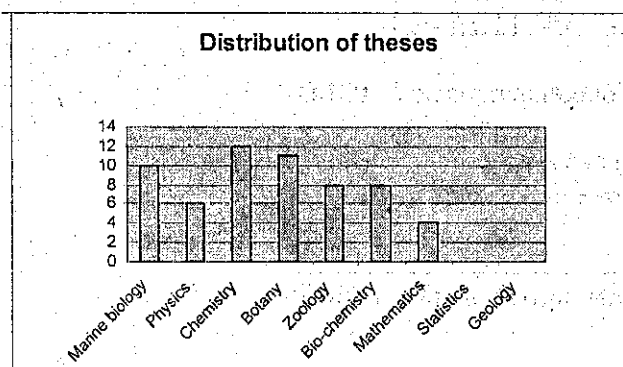
### GENDERWISE DISTRIBUTION

Research facilities are available for both sex and there is no gender discrimination in Research and Development Programmes in Annamalai University. The Table-3 depicts that 74.79% of the male candidates and 25.21% of the remaining were occupied by Female candidates were awarded Ph.D during the study periods. Among Female candidates, the Chemistry department was produced 20.34% and followed by Botany (18.64%), Marine Biology (16.95%). The data also focused that 13.56% each were produced in Zoology and Biochemistry, followed by Physics (10.17%) and Maths (6.77%) were identified.

Table 3- Genderwise distribution of theses

Sl.No.	Subjects	Male	Male Percentage	Female	Female Percentage
1	Marine biology	48	20.51	10	4.27
2	Physics	28	11.97	6	2.56
3	Chemistry	32	13.68	12	5.13
4	Botany	21	8.97	11	4.70
5	Zoology	16	6.84	8	3.42
6	Bio-chemistry	6	2.56	8	3.42
7	Mathematics	12	5.13	4	1.71
8	Statistics	3	1.28	—	—
9	Geology	9	3.85	—	—
<b>Total</b>		<b>175</b>	<b>74.79</b>	<b>59</b>	<b>25.21</b>

Fig 2: Distribution of Ph D theses by female candidates during 2001-2005



### GUIDEWISE DISTRIBUTION OF PHD THESES

The Table 4 indicates that 96 guides guided 234 PhD scholars. Out of 96 guides in the faculty of science the most productive guides by discipline wise were given in Appendix 2 and 2a in details. Thus the productivity rates for the scholars in all disciplines were higher than the guides.

There is only one D.Sc in Marine Biology awarded to Prof. (Dr.) Kathiresan in the sub-field of Mangrove Ecosystem during the study period.

Table 4 - Guide wise distribution of theses

Sl.No.	Subjects	No. of Guides	No. of PhD Guided
1	Marine Biology	19	58
2	Chemistry	19	44
3	Physics	16	34
4	Botany	14	32
5	Zoology	9	24
6	Mathematics	7	16
7	Biochemistry	7	14
8	Geology	4	9
9	Statistics	1	3
<b>Total</b>		<b>96</b>	<b>234</b>

### CONCLUSION

Distribution and frequencies of Ph.D theses of the faculty of science in Annamalai University has a despairingly there is no PhD thesis in an applied science researches such as biotechnology, genetic engineering and biodiversity studies. Fortunately awareness that such studies are lacking but urgently needed to increasing the number of students still in Ph.D Programmes have started research in contemporary technologies.

Biodiversity plays a key role in the field of Science; it expands the frontiers of knowledge about nature and improves our quality of life. Therefore it requires deep thinking about simple things. The study reveals that most of the guides produced Ph. Ds in the same sub fields in their disciplines were identified.

DR. S. RAVI, V. MOHAN AND P. SRINIVASARAGAVAN

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## APPENDIX 1 –Distribution of Ph.D Theses in Sub-fieldwise

Sl.No	Name of Subfields	No. of PhDs Produced	Sl.No	Name of Subfields	No. of PhDs Produced
<b>Subject: Marine Biology</b>			<b>Subject: Physics</b>		
1	Fishery biology	9	43	Spectroscopic study	16
2	Marine Ecology	6	44	Solid Physics	4
3	Seaweed/Algae	5	45	Dielectric physics	4
4	Estuaries	4	46	Sound Physics	3
5	Marine Biology	4	47	Liquid Physics	3
6	Mangroves	4	48	Radiation Physics	2
7	Microbiology	4	49	Magnetism	2
8	Toxicology	3	<b>Subject: Chemistry</b>		
9	Molluscs	3	45	Heterocyclic compound	7
10	Plankton/Benthos	3	46	NMR Spectra	4
11	Larval development	2	47	Ketonetics	4
12	Hydrobiology	2	48	Nitrogen compound	4
13	Histopathology	1	49	Spectral analysis	4
14	Fish Nutrition	1	50	Chemistry-general	2
15	Marine Mammals	1	51	Electron Transfer reaction	2
16	Seafarming	1	52	Comparitive study	2
17	Reproductive Biology	1	53	Chromium complexes	2
18	Marine chemistry	1	54	Aromatics	2
19	Population dynamics	1	55	Crystallisation	1
20	Bioactive compomnents	1	56	Phenoxy acids	1
21	Shrimp diseases	1	57	Conformation studies	1
<b>Subject: Botany</b>			58	Semiconductor studies	1
22	Plant physiology	14	59	Schiffbase complexes	1
23	Taxonomy/classification	8	60	Photocatalysed reaction	1
24	Ecology	3	61	industrial effiluent	1
25	Algae/seaweeds	3	62	Oxidation	1
26	Plant morphology	2	63	Sterio chemistry	1
27	Plant pathology	1	64	Organic chemistry	1
28	Soil analysis	1	65	Photochemical analysis	1
<b>Subject: Zoology</b>			<b>Subject: Mathematics</b>		
29	Toxicology	6	66	Analysis	10
30	Nutrient analysis	3	67	Fuzzy	3
31	Reproductive Biology	2	68	Graph Theory	1
32	Biochemical Study	2	69	Sequencial analysis	1
33	Microbiology	2	70	Algebra	1
34	Entomology	1	<b>Subject: Statistics</b>		
35	Feed efficacy	1	71	SCBZ Property	1
36	Parasitology	1	72	Stochastic model	1
37	Histopathology	1	73	Control Charts	1
38	Pollution	1	<b>Subject: Geology</b>		
39	Ecology	1	74	Hydrology	4
40	Reproductive physiology	1	75	GIS	2
41	Fish Toxicology	1	76	Geochemical study	3
42	Fish Ecology	1	<b>Subject: Bio-chemistry</b>		
					14

## Appendix 1a – Frequencies of subfield wise awarded Ph.D Theses during 2001-2005

Sl. No.	Subfields in all subjects	Frequencies	Sl. No.	Subfields in all subjects	Frequencies
1	Spectroscopic study(Eco-toxicology)	16	42	Comparitive study	2
2	Plant physiology	14	43	Chromium complexes	2
3	Biochemistry	14	44	Aromatics	2
4	Analysis	10	45	GIS	2
5	Fishery biology	9	46	Histopathology	1
6	Taxonomy/classification	8	47	Fish Nutrition	1
7	Heterocyclic compound	7	48	Marine Mammals	1
8	Marine Ecology	6	49	Seafarming	1
9	Toxicology	6	50	Reproductive Biology	1
10	Seaweed/Algae	5	51	Marine chemistry	1
11	Estuaries	4	52	Population dynamics	1
12	Marine Biology	4	53	Bioactive compoments	1
13	Mangroves	4	54	Shrimp diseases	1
14	Microbiology	4	55	Plant pathology	1
15	Solid Physics	4	56	Soil analysis	1
16	Dielectric physics	4	57	Entomology	1
17	NMR Spectra	4	58	Feed efficacy	1
18	Ketonetics	4	59	Parasitology	1
19	Nitrogen compound	4	60	Histopathology	1
20	Spectral analysis	4	61	Pollution	1
21	Hydrology	4	62	Ecology	1
22	Toxicology	3	63	Reproductive physiology	1
23	Molluscs	3	64	Fish Toxicology	1
24	Plankton/Benthos	3	65	Fish Ecology	1
25	Ecology	3	66	Crystallisation	1
26	Algae/seaweeds	3	67	Phenoxy acids	1
27	Nutrient analysis	3	68	Conformation studies	1
28	Sound Physics	3	69	Semiconductor studies	1
29	Liquid Physics	3	70	Schiffbase complexes	1
30	Fuzzy	3	71	Photocatalysed reaction	1
31	Geochemical study	3	72	industrial effiluent	1
32	Larval development	2	73	Oxidation	1
33	Hydrobiology	2	74	Sterio chemistry	1
34	Plant morphology	2	75	Organic chemistry	1
35	Reproductive Biology	2	76	Photochemical analysis	1
36	Biochemical Study	2	77	Graph Theory	1
37	Microbiology	2	78	Sequential analysis	1
38	Radiation Physics	2	79	Algebra	1
39	Magnatism	2	80	SCBZ Property	1
40	Chemistry-general	2	81	Stochastic model	1
41	Electron Transfer reaction	2	82	Control Charts	1

## Appendix - 2 Subjects and Guidewise Distribution of Ph.D Theses

Sl. No.	Name of the Guides	No of PhDs Guided	Sl. No.	Name of the Guides	No of PhDs Guided
<b>Subject: MARINE BIOLOGY</b>			50	Dheenathayalu, M	2
1	Kathiresan, K	6	51	Rakkappan, C	2
2	Ajmal Khan, S	5	52	Balamuralikrishnan	1
3	Kannan, L	5	53	Palanivel, R	1
4	Lyla, P.S	5	54	Rajamannan, B	1
5	Perumal, P	5	55	Ramasamy, V	1
6	Rajagopal, S	4	56	Sridharan, K	1
7	Shanmugam, A	4	57	Vsantharam, P	1
8	Srinivasan, M	4	58	Venkatachalapathy, R	1
9	Balasubramanian, T.	3	<b>Subject: Chemistry</b>		
10	Kannupandi, T	3	59	Gopaiakrishnan, M	4
11	Veerappan, N	3	60	Kabilan, S	4
12	Antony Fernandes, S	2	61	Manimekhalai, A	4
13	Oliva, J. Fernandes	2	62	Karunakaran, C	3
14	Purushothaman, A	2	63	Krishnan, C.N	3
15	Ramaiyan, V	2	64	Pandiarajan, K	3
16	Subramanian, A.N	2	65	Sabapathymohan, R.T	3
17	Kasinathan	1	66	Sanagaran, K.R	3
18	Sampathkumar, P	1	67	Swaminathan, M	3
19	Soundrapandian	1	68	Meenakshisundaram, S.P	2
<b>Subject: Botany</b>			69	Nagarajan, S	2
20	Selvaraj, R	6	70	Palaniappan, A.N	2
21	Subramanian, D	4	71	Ramalingam, K	2
22	Arumugam, K	3	72	Ananthakrishnan,	1
23	Panneerselvam, R	3	73	Bharani, N	1
24	Chellappan, K	2	74	Divarapan, I	1
25	Ravindran, K.C	2	75	Prabhakar, L.D	1
26	Sampathkumar, R	2	76	Parameswaran, V.R	1
27	Sundaramoorthy, P	2	77	Sundari, V	1
28	Thamizhiniyan	2	<b>Subject: Biochemistry</b>		
29	Vembu, B	2	78	Venugopal, P. Menon	5
30	Ranganathan, R	1	79	Anuradha, C.V	2
31	Tamilmani	1	80	Pari, L	2
32	Venkatesan, A	1	81	Subramanian, P.	2
33	Venkatesalu	1	82	Nagini, S	1
<b>Subject: Zoology</b>			83	Nalini, N	1
34	Jebanesan, A	5	84	Sethupathy, S	1
35	Selvi Sabanayagm	5	<b>Subject: Mathematics</b>		
36	Ranganathan, L.S	4	85	Meenakshi, A.R	5
37	Indra, N	2	86	Dheena, P	4
38	Jegadesan, G	2	87	Kalyanaraman, R	2
39	Mathivanan, V	2	88	Ranganathan, N	2
40	Meenakshi, V.	2	89	Narayanan, A.L	1
41	Hemalatha, S	1	90	Sampathkumkar, R	1
42	Ramalingam, R	1	91	Vairamanickam, K	1
<b>Subject: Physics</b>			<b>Subject: Statistics</b>		
43	krishnan, S	4	92	Sathyamoorthi, R	3
44	Narayanaswamy, R	4	<b>Subject: Geology</b>		
45	Barathan, S	3	93	Ramkumar, T	4
46	Kalyanaraman, S.B	3	94	Arumugam, M	3
47	Kannappan, A.N	3	95	Chithambram, S	1
48	Palaniappan, PL	3	96	Ramanathan	1
49	Ramamurthy, N	3			

Appendix 2a - Number of PhDs produced by Guides

Ph.Ds	Name of the Guides	Ph.Ds	Name of the Guides
6	Kathiresan, K	2	Sundaramoorthy, P
6	Selvaraj, R	2	Thamizhiniyan
5	Ajmal Khan, S	2	Vembu, B
5	Kannan, L	2	Indra, N
5	Lyla, P.S	2	Jegadesan, G
5	Perumal, P	2	Mathivanan, V
5	Jebanesan, A	2	Meenakshi, V
5	Selvi Sabanayagm	2	Dheenathayalu, M
5	Venugopal, P. Menon	2	Rakkappan, C
5	Meenakshi, A.R	2	Meenakshisundaram, S.P
4	Rajagopal, S	2	Nagarajan, S
4	Shanmugam, A	2	Palaniappan, A.N
4	Srinivasan, M	2	Ramalingam, K
4	Subramanian, D	2	Anuradhā, C.V
4	Ranganathan, L.S	2	Pari, L
4	Krishnan, S	2	Subramanian, P
4	Narayanaswamy, R	2	Kalyanaraman, R
4	Gopalakrishnan, M	2	Ranganathan, N
4	Kabitan, S	1	Kasinathan
4	Manimekalai, A	1	Sampathkumar, P
4	Dheena, P	1	Soundrapandian
4	Ramkumar, T	1	Ranganathan, R
3	Balasubramanian, T.	1	Tamilmani
3	Kannupandi, T	1	Venkatesan, A
3	Veerappan, N	1	Venkatesalu
3	Arumugam, K	1	Hemalatha, S
3	Panneerselvam, R	1	Ramalingam, R
3	Barathan, S	1	Balamuralikrishnan
3	Kalyanaraman, S.B	1	Palanivel, R
3	Kannappan, A.N	1	Rajamannan, B
3	Palaniappan, PL	1	Ramasamy, V
3	Ramamurthy, N	1	Sridharan, K
3	Karunakaran, C	1	Vsantharam, P
3	Krishnan, C.N	1	Venkatachalapathy, R
3	Pandiarajan, K	1	Ananthakrishnan,
3	Sabapathymohan, R.T	1	Bharani, N
3	Sanagaran, K.R	1	Divarapan, I
3	Swaminathan, M	1	Prabhakar, L.D
3	Sathyamoorthi, R	1	Parameswaran, V.R
3	Arumugam, M	1	Sundari, V
2	Antony Fernandes, S	1	Nagini, S
2	Oliva, J. Fernandes	1	Nalini, N
2	Purushothaman, A	1	Sethupathy, S
2	Ramaiyan, V	1	Narayanan, A.L
2	Subramanian, A.N	1	Sampathkumkar, R
2	Chellappan, K	1	Vairamanickam, K
2	Ravindran, K.C	1	Chithambram, S
2	Sampathkumar, R	1	Ramanathan