Annexures for Chapter 2

Annexure-2.1

List of Agricultural Universities in India

State	Universities
Andhra Pradesh	1. Acharya N.G. Ranga Agricultural University, Rajendranagar, Hyderabad-500 030 2. Andhra Pradesh Horticulture University Tadepalligudem, Andhra Pradesh - 534 101 3. Sri Venkateswara Veterinary University Tirupati, Chitor 517 502
Assam	4. Assam Agricultural University Jorhat-785 012, Assam
Bihar	5. Bihar Agricultural University Sabour -813 210, Bhagalpur District, Bihar 6. Rajendra Agricultural University Pusa, Samastipur 848 125 , Bihar
Chhattisgarh	7. Indira Gandhi Krishi Vishwavidyalaya Raipur 492 012, Chhattisgarh
Delhi	8. Indian Agricultural Research Institute, New Delhi 110012 (Deemed Univ)
Gujarat	9. Anand Agricultural University Anand 388 110, Gujarat 10. Junagadh Agricultural University Junagadh 362 001, Gujarat 11. Navasari Agricultural University Navsari 396450, Gujarat 12. Sardarkrushinagar – Dantiwada Agricultural University Sardar Krushinagar, District Banaskantha 385 506, Gujarat 13. Kamdhenu University for Veterinary, Dairy Science and Fisheries, Himmatnagar, Sabarkantha-383001, Gujarat*
Haryana	14. Ch Charan Singh Haryana Agricultural University Hisar, 125004 Haryana 15. Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar 125001 Haryana* 16. National Dairy Research Institute, Karnal 132 001 (Deemed Univ)
Himachal Pradesh	17. CSK Himachal Pradesh Krishi Vishvavidyalaya Palampur 176 062, Himachal Pradesh 18. Dr Yashwant Singh Parmar University of Agriculture & Forestry Solan, Nauni 173 230, Himachal Pradesh
Jammu & Kashmir	19. Sher-E-Kashmir University of Agricultural Sciences & Technology Jammu 180 012, Jammu & Kashmir 20. Sher-E-Kashmir of Agricultural Sciences & Technology of Kashmir Srinagar 191 121, Jammu & Kashmir
Jharkhand	21. Birsa Agricultural University Kanke. Ranchi 834 006, Jharkhand
Karnataka	22. University of Agricultural Sciences

	GKVK, Bangalore 560 065 , Karnataka 23. University of Agricultural Sciences Dharwad 580 005, Karnataka 24. University of Agricultural Sciences Raichur-584 102, Karnataka 25. Karnataka Veternary, Animal and Fisheries Sciences University, Nandinagar, Bidar-585 401, Karnataka 26. University of Horticultural Sciences Bagalkot-587 102, Karnataka
Kerala	27. Kerala Agricultural University Vellanikkara, Trichur 680 656, Kerala 28. Kerala Veterinary and Animal Sciences University Thiruvananthapuram, 695004, Kerala 29. Kerala University of Fisheries and Ocean Studies Panangad, Kochi 682506 Kerala*
Madhya Pradesh	30. Jawaharlal Nehru Krishi Viswavidyalaya Jabalpur 482 004, Madhya Pradesh 31. Rajmata Vijayraje Sciendia Krishi Vishwa Vidyalaya Gwalior-474002, Madhya Pradesh 32. Madhya Pradesh Pashu-Chikitsa Vigyan Vishwavidyalaya Jabalpur 48200, Madhya Pradesh*
Maharashtra	33. Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli District , Ratnagiri 415 712, Maharashtra 34. Dr Panjabrao Deshmukh Krishi Vidyapeeth, Krishi nagar Akola 444 104, Maharashtra 35. Mahatma Phule Krishi Vidyapeeth Rahuri 413 722, Maharashtra 36. Marahtwada Agricultural University Parnhani 431 402, Maharashtra 37. Maharashtra Animal Science & Fishery University, Nagpur 440 006, Maharashtra 38. Central Institute of Fisheries Education, Mumbai-61 (Deemed Univ)
Manipur	39. Central Agricultural University Imphal 795 004 Manipur
Orissa	40. Orissa University of Agriculture & Technology Bhubaneshwar 751 003, Orissa
Punjab	41. Guru Angad Dev Veterinary and Animal Science University Ludhiana- 141004, Punjab 42. Punjab Agricultural University Ludhiana 141 004 , Punjab
Rajasthan	43. Maharana Pratap University of Agriculture & Technology Udaipur, Rajasthan 313 001 44. Rajasthan Agricultural University Bikaner 334 006 , Rajasthan 45. Rajasthan University of Veterinary and Animal Sciences Bikaner-334 001, Rajasthan
Tamil Nadu	46. Tamil Nadu Agricultural University Coimbatore 641 003, Tamil Nadu 47. Tamil Nadu Veterinary and Animal Sciences University

	Chennai 600 051, Tamil Nadu
Uttaranchal	48. Govind Ballabh Pant University of Agriculture & Technology Pantnagar 263 145, Uttaranchal
Uttar Pradesh	49. Chandra Shekar Azad University of Agriculture & Technology Kanpur 208 002, Uttar Pradesh 50. Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad 224 229, Uttar Pradesh 51. Sardar Vallabh Bhai Patel University of Agriculture & Technology, Modipuram, Meerut-250 110, Uttar Pradesh 52. UP Pandit Deen Dayal Upadhaya Pashu Chikitsa Vigyan Vishwa Vidhyalaya, Mathura-281001, Uttar Pradesh 53. Sam Higginbotom Institute of Agriculture, Technology and Services, Allahabad-211 007, Uttar Pradesh (Deemed University) 54. Indian Veterinary Research Institute Izatnagar 243122, Uttar Pradesh (Deemed University)
West Bengal	55. Bidhan Chandra Krishi Viswavidyalaya Mohanpur, Kalyani, Nadia-741 252, West Bengal 56. Uttar Banga Krishi Viswavidyalaya District Cooch Bihar-736 165, West Bengal 57. West Bengal University of Animal and Fishery Sciences Kolkata-700 037, West Bengal

Source: ICAR, New Delhi. taken from www.icar.org.in on July 30, 2011

* New universities established recently and are not listed on ICAR web site

Others Universities and Institutions having Agriculture Faculty

S.No.	Name of the University
	Central Universities
1.	Aligarh Muslim University (AMU), Aligarh-202002, Uttar Pradesh
2.	Banaras Hindu University (BHU), Varanasi, 221005, Uttar Pradesh
3.	Visva-Bharati University, Santiniketan – 731235, West Bengal
4.	Nagaland University, Kohima- 797001, Nagaland
	Others
5.	Osmania University, Hyderabad-500007, Andhra Pradesh
6.	Mahatma Gandhi Gramodyog Viswavidyalaya, Chitrakoot, Madhya Pradesh
7.	MDS University, Ajmer, Rajasthan
8.	Universityof Rajasthan, Jaipur, Rajasthan
9.	Annamalai University, Annamalainagar, Tamil Nadu
10.	Gandhi Gram Rural Institute, Gandhigram, Tamil Nadu

11.	Bundelkhand University, Jhansi**,** Uttar Pradesh
12.	University of Allahabad, Allahabad, Uttar Pradesh
13.	Chhatrapati Sahuji Maharaj University, (CSJM), Kanpur, Uttar Pradesh
14.	Poorvanchal University, Jaunpur, Uttar Pradesh
15.	Mahatma Jyotiba Phue Rohilkhand University, Barailley, Uttar Pradesh
16.	Deen Dayal Upadhyay University (University of Gorakhpur), Gorakhpur, Uttar Pradesh
17.	Kanpur University, Kanpur, Uttar Pradesh
18.	Dr.B.R. Ambedkar University (Agra University), Agra, Uttar Pradesh
19.	Chowdary Charan Singh University (Meerut University), Meerut, Uttar Pradesh
20.	HN Bahuguna Garhwal University, Srinagar, Uttarakhand
21.	Kumaun University, Nainital, Uttarakhand
22.	Calcutta University, Calcutta, West Bengal
23.	University of Bangalore, Bengaluru, Karnataka
24.	Manipur University, Canchipur, Imphal , Manipur
25.	North East Hill University, Shillong, Meghalaya
26.	Karnatak University, Dharwar, Karnataka
27.	Guru Ghasidas University, Bilaspur, Chhattishgarh
28.	Guru Nanak Dev University, Amritsar, Punjab
29.	Cochin Univ of Sci & Tech, Cochin, Kerala
30.	Forest Research Institute, Dehra Dun-248195, Uttarakhand
31.	IIT, Kharagpur, West Bengal
32.	Indian Institute of Forest Management, Nehru Nagar, Bhopal, Madhya Pradesh
33.	Indian Institute of Remote Sensing, Dehradun, Uttarakhand
34.	Wildlife Institute of India, Dehradun, Uttarakhand

Source: Project data; Rama Rao & Muralidhar, 1994 and Kirti Singh, 1995

Annexure-2.2

List of Under Graduate Courses Offered in State Agricultural Universities

S. No	Under Graduate Course
1.	B.Sc (Agriculture)
2.	B.Sc (Horticulture)
3.	B.Sc (Forestry)
4.	B.Sc (Agricultural Marketing, Banking & Cooperation)
5.	B.Sc (Agricultural Biotechnology)
6.	B.V.Sc & A.H. (Veterinary Science & Animal Husbandry)
7.	B.F.Sc. (Fisheries)
8.	B.Tech (Dairy Technology)
9.	B.Tech (Agricultural Engineering)
10.	B.Tech (Food Science &Technology)
11.	B.Tech (IT in Agriculture)
12.	B.Sc (Agricultural Business Management)
13.	B.Sc (Home Science)
14.	B.Sc. (Sericulture)

Annexure-2.3

Number of Colleges and Students Intake and Outturn in 2010

Discipline	Number of colleges				Students strength	
	SAUs	Affiliated to SAUs	Gen Univ	All	Intake	Outturn
Agriculture	83	112	33	228	21303	15949
Horticulture	35	8	3	46	2283	1465
Forestry	26	-	11	37	1160	716
Veterinary & AH	51	7	1	59	3521	2683
Fishery	24	-	1	25	792	424
Dairy	21	-	1	22	751	310
Agri –Engineering	33	6	1	40	2487	1507
Agri-Biotechnology	28	6	-	34	822	734
Sub-total for above eight disciplines	301	139	51	491	33119	23788
Food Sci & Tech	19	11	22	52	1650	1000*
Agri-business Management	22	13	30	65	3500	2100*
Home Science	18	-	NA	18	1060	700
Grand Total	360	163	103	626	39329	27588

* Estimate based on out turn of about 60 per cent in SAUS

Annexures for Chapter 3

Annexure-3.1

Methodology Adopted for Forecasting

Step 1: Identify different subsectors of the sector that are important absorbers of manpower of the discipline under consideration:
This is done on the basis of experience, judgment and consultation.

Step 2: Estimate the total employment in different subsectors in 2009-10
The methods used differ from subsector to subsector depending on the availability of information. Generally the following methods are used;
a) In the case of some sub-sectors **data on total employment is available** from other sources, for 2009-10 or e recent year. In such cases, the estimate for 2009-10 has been obtained on the basis of trend analysis. Such subsectors are, **for example**,

Sub-sector	Source	Nature of data
Banks	Banking Statistics of Reserve Bank of India	No. of officers and others each year latest being 2008-09
Different Processing industries (Dairy, agro-, fruit, meat, fish, etc.	Annual Survey of Industries, CSO	Total employment, number of factories, each year, latest being 2005-06
Input industries like fertilizers, pesticides, agricultural equipment, animal feed, etc.	-do-	-do-
Output absorbing industries like, pharmaceuticals, paper, wood processing,	-do-	-do-
Government departments dealing with the subsector	Websites of the respective departments	Total employment, classified by posts
ICAR institutions	PERMISNET of ICAR	Data obtained as in April 2010 from ICAR
Teaching staff in the SAUs	Institutional schedules from SAUs	Data on teachers by qualification and field 2009-10

b) For some sub-sectors, data for total employment is not available, but **only on the number of units** in the sub-sector. **Examples** of such subsectors are :

Sub-sector	Source	Nature of data
Seeds	Seed producers' Association	No. of plants of different sizes, 2009-10
Nurseries	11th Plan Working group on Horticulture, National Horticultural Mission,	Number of nurseries in 2003-04 and year-wise new nurseries each year for subsequent years

Dairy plants	Animal Husbandry Statistics, D/Animal Husbandry, published in IASRI Data Books for various years	Number of plants and processing capacity in cooperative, private and publics sectors
Aqua-culture units	Coastal Aqua Culture Authority, data available from web-site	No. of units of different sizes in 2009-10
Fishing equipment	IASRI Data book for various years	Vessels of different types

In these cases, the total number of units in 2009-10 is first estimated. Employment per unit is obtained from Establishment Survey and total employment in the subsector is obtained by multiplying the number of units by the per-unit employment.

In some cases, per unit employment could not be estimated from Establishment Survey due to data problems. In such cases, norms available from various sources have been used. For example, in the fisheries sector, such norms as are available from CIFE were used to estimate the employment in fish hatcheries, etc.

Step 3: Projection of total employment till 2019-20
This has been done using past trends, target growth rates, Plan targets, likely achievements based on judgment and consultation with experts

Step 4: Breaking up the total employment by discipline and level of qualification (diploma/UG/PG/PhD)
This is done on the basis of proportions obtained from Establishment Survey for each year, assuming generally that the proportions of the base year hold good for the next ten years. Where necessary some judgmental adjustments have been made.

The above 4 steps lead to estimates of stock of manpower (of specific discipline) expected to be required each year up to 2019-20.

Step 5: Conversion of stock estimates to flow estimates.
The flows of manpower required in each year have been derived from the stock estimates taking into account
i) annual increment, being the excess of stock demand in a year over the previous year;
ii) requirement due to attrition calculated as 3% of the previous year's stock in all sectors except in Biotechnology where it is taken as 1% due to youthful ness of the stock, and
iii) adjustment for the fact that in any year, a number of alumni would be pursuing higher education at PG and PHD levels and therefore not available for economic activities.

These flow estimates give the likely outturns required from the educational system in the future years. The corresponding intake levels would depend on the drop out ratios and non-participation in economic activities after completing education.

Annexure-3.2

Estimation of Manpower Replacement Needs

The agricultural manpower attrition rates for the projection period 2010-11 to 2029-20 have been estimated in the following manner. Total attrition factor comprises of depletion of manpower stocks due to

a) Retirements
b) Deaths
c) Migration
d) Other factors like voluntary withdrawal from labour force

A. Retirements

The average retirement age in government and other public sector organizations may be taken as 60 (It varies from 58 to 60 in State governments and may go up to 62 in central research organizations). Assuming this average age of retirement, those who retire during the projection period of 2010-11 to 2019-20 would be those who entered labour force 38 years earlier in the case of graduates, 36 years earlier in the case of post-graduates and 33 years earlier in the case of doctorates), that is, during the years 1972-81 for graduates, 1974-83 for post-graduates and 1977-86 for doctorates. Year of entry into labour force may be roughly taken as the year of passing, as any time lag would bring in those who passed in earlier and leave out those who passed out in the later years, which are likely to cancel out each other, when the whole period is considered.

Available data on out-turns of agricultural graduates, post-graduates and doctorates during the years 1970 to 1990 is given below:

Out-turn of Agricultural Human Resources (1970-90)

Year	Outturn during the year		
	Graduates	Post-graduates	Doctorates
1970	5909	1670	217
1974	4505	1419	287
1975	3966	1511	289
1978	6280	2384	422
1979	6280	2384	480
1984	8116	2785	678
1985	8257	3119	782
1986	7414	2767	684
1987	7810	2827	832
1988	7757	2752	832
1989	8301	2876	792

Source: Department of Science and Technology, Research and Development Statistics, 2007-08. Data for some years 1971to1973,1976, 1977, and1980 to 1983 are not available.

The average annual outturns for the relevant periods were estimated at 5,843 for graduates, 2,267 for post-graduates and 609 for doctorates respectively on the basis of the above available information. Thus, the total attrition due to retirements works out to 8,719 or, say,

9,000 during the projection period. The estimated stock requirement for the year 2009-10 in various disciplines is given below:

Estimated Stock of Agricultural Manpower Required in 2009-10

Discipline	Graduates	Post-graduates	Doctorates	All
Crop sciences	211929	59689	22041	293659
Horticulture	50240	9256	3069	62565
Veterinary & Animal Sciences	28772	8873	4521	42166
Dairy Science & Technology	14043	1833	1010	16886
Fisheries Sciences	10635	2332	986	13953
Bio-technology	1150	887	951	2988
Agricultural Engineering.	13111	4243	2160	19514
Forestry	6718	2678	1189	10585
Grand Total	336598	89791	35927	462316

Source: Projections from the respective sector chapters

Thus, the total required stock of agricultural graduates and above in 2009-10 is about 4.62 lakhs. The annual attritions of 9,000 due to retirements would, thus, be around 1.95% of the stock.

B. Mortality

For estimating attrition due to mortality, it was assumed that the mortality pattern among the urban population in the age group 20-60 would be relevant for the agricultural manpower stock. The projected urban population in the working ages and the corresponding age-specific mortality rates are given below:

Projected Urban Population by Age and Age-specific Mortality Rates (2005)

Age-group	Projected Urban Population (000)	Age-specific Mortality Rate (per 000)	Estimated annual deaths
20-24	32,525	1.6	32,535
24-29	29,312	1.7	29,312
30-34	26,055	2.0	26.055
35-39	23,185	2.8	23,185
40-44	20,209	3.5	20,209
45-49	16,837	5.3	16,837
50-54	13,306	7.8	13,306
55-59	10,088	11.7	10,088
All aged 20-59	171,517	3.5	600,682

Source: 1. Planning Commission, Technical Note on Employment in Eleventh Plan for population projections,
2. Registrar General of India, Sample Registration system, Statistical Report, 2005, cited in IAMR, Manpower Profile 2009

The annual losses due to mortality among urban population in the working age-groups are, thus, about 3.5 per 1000 or 0.35%. Together with retirements, this raises the annual rate of attrition to 2.3%.

C. Migration and Other Factors

No information is available on the migration of agricultural graduates to other countries, though the phenomenon is there. Similarly, no information is available about the extent of withdrawal of agricultural manpower from labour force due to other factors like disability, shift to other fields of activity, and voluntary abstinence from economic activity. The combined effect of all these factors has been assumed to be 0.7% on an ad hoc basis.

D. Overall Rate of Attrition

The overall attrition rate, thus, may be placed at about 3% of the manpower stock. This rate has been used uniformly in determining the annual flows of manpower required in all disciplines, with the sole exception of Bio-technology, where all the manpower was of recent origin and would not be retiring during the next decade. In the case of Bio-technology, therefore, the attrition rate has been assumed to be only 1% for mortality and other factors.

Annexure-3.3

Requirements of Higher Education

If various sectors of the economy together require certain numbers of graduates, post-graduates and doctorates in agricultural fields in a year, the actual outputs required from the educational institutions at graduate and post-graduate levels will be somewhat higher, because many graduates do not enter the labour market directly but go in for post-graduation and many post-graduates go in for doctoral work instead of employment.

Let the actual requirements of the economy in the year 'n' be as follows:
g(n) = the number of graduates required by the economy
p(n) = the number of post-graduates required by the economy
d(n) = the number of Ph.Ds required by the economy

Let
G(n) = the final outturn of graduates required from the educational system
P(n) = the final outturn of post-graduates
D(n) = the final outturn of doctorates

Assuming that in general it takes 3 years for a post-graduate to become a Ph.D and 2 years for a graduate to become post-graduate, the actual outturn of doctorates, post-graduates and graduates required in the year 'n' would be

$D(n) = d(n)$
$P(n) = p(n) + d(n+3)$
$G(n) = g(n) + P(n+2) = g(n) + p(n+2) + d(n+5)$

Annexure-3.4

Sampling of Districts in the Country

All the States and Union Territories were covered. For allocating the 100 districts among all the States, four criteria have been considered a) the proportion of districts in the State to the total number of districts in the country b) the proportion of establishments in the organized sector in the State to those in all States (as given by the Ministry of Labour's EMI programme for 2004-05) c) the State's share of regular employment in agriculture related activities (agriculture, food processing industries, textiles and wholesale and retail trade in agriculture) as obtained from the unit level data from the 61st Round of NSS (2004-05)[1], and d) the number of agricultural and veterinary graduates aged 15 or more) in the State (as given in 2001 Census, Table C8). Allocating the sample on the basis of number of districts in the State no doubt gives a self-weighting first stage sample, but it would not be the best, as there are several States with a large number of districts but with very little presence of agricultural manpower. In the case of number of establishments in the organized sector, it has to be remembered that only a fraction of them are relevant for agricultural graduates. The proportion of regular employees in certain sectors relevant to the subject under consideration (criterion c) also includes all regular employees in the selected industries irrespective of whether they are agricultural graduates or not. Allocation based on the number of agricultural and veterinary graduates enumerated in the 2001 Census is considered most direct and useful as the main purpose of the Establishment Survey is to obtain the occupational-educational pattern of the employed agricultural manpower, and the number of graduates enumerated in the Census in a district/State is a good proxy for the number of employed graduates. It has, however, been observed that the allocations based on criteria b) and c) also give the same broad pattern as allocation based on criterion d) with relatively higher shares for States like Maharashtra, Uttar Pradesh, Tamil Nadu, Karnataka and Andhra Pradesh.

The principles followed in the allocation, therefore, are as follows:

- The number of districts allocated to a State generally is its proportional share in the number of agricultural and veterinary graduates and above as enumerated in the 2001 Census, subject to the adjustments given below.
- In States/UTs, where there is only one district, that is automatically covered, irrespective of the number of graduates enumerated.
- In States where there are two districts, both the districts are similarly covered. Covering only the capital district will introduce bias.
- In States where there are three or more districts, but have a share of less than 1% in the number of total number of agricultural and veterinary graduates in the country, only two districts selected – the capital district and the second to be chosen from the other districts through probability sampling.
- In all other States, a minimum of three districts are covered.
- The maximum number of districts allocated to a State is fixed at 20% of the total number of districts in the State
- The total number of district allocated came to 103.
- In Bihar, the Census data give an excessively large number of over 19000 agricultural graduates in the State, with half of them (9500) in Muzaffarpur district alone. In view

[1] Courtesy Dr. Nilabja Ghosh, Institute of Economic Growth.

of the doubtful nature of the data, the State has been allocated 4 districts (10% of all districts in the State).

List of selected districts is given below:

Establishment Surveys - Allocation of Districts Among States

Sl. No	State	Total districts 2009	No. of estt. org. sector 2004-05	No. of Ag. grads. (2001)	Reg. emp. In		Number of districts allocated			Remark
					Ag. related NSS2004-05	Others	Capital	Others	total	
1	Andaman and Nicobar Islands	3	168	195			1	1	2	
2	Andhra Pradesh	23	22770	10690	10.5	9.8	1	4	5	20 % of total districts
3	Arunachal Pradesh**	16		455			1	1	2	
4	Assam	27	7343	3080			1	2	3	Minimum 3
5	Bihar	38	5415	19204	1.6	1.4	1	3	4	10% of total districts
6	Chandigarh	1	1252	341			1		1	
7	Chattisgarh	16	3177	1448	1.1	1.9	1	1	2	
8	Dadra and Nagar Haveli**	1		36			1		1	
9	Daman and Diu	2	446	14			1	1	2	
10	Delhi*	1	7820	1252	0.0	0.0	1		1	
11	Goa	2	1013	368	0.1	0	1	1	2	
12	Gujarat	25	30364	7386	5.0	6.1	1	4	5	20% of total districts
13	Haryana	21	9591	2251	3.7	2.2		3	3	Minimum 3
14	Himachal Pradesh	12	4273	1061			1	1	2	
15	Jammu & Kashmir	15	2779	2631	0.5	0.5	1	1	2	
16	Jharkand	24	3889	824	0.7	0.0	1	1	2	
17	Karnataka	28	22079	6640	3.2	7.5	1	4	5	
18	Kerala	14	21244	6447	5.7	8.8	1	2	3	20% of total districts
19	Lakshadweep**	1		32			1		1	
20	Madhya Pradesh	50	11193	6745	4.1	1.5	1	4	5	
21	Maharashtra	35	25121	21521	12.1	18.0	1	6	7	20% of total

										districts
22	Manipur	9	972	737	2.4	2.3	1	1	2	
23	Meghalaya	7	1148	403			1	1	2	
24	Mizoram	8	498	237			1	1	2	
25	Nagaland	11	1033	404			1	1	2	
26	Orissa	30	9831	3791	2.4	2.3	1	2	3	
27	Puducherry	4	459	578			1	1	2	
28	Punjab	20	11644	3116	5.0	3.7		3	3	Minimum 3
29	Rajasthan	32	18623	1371	2.5	2.0	1	2	3	Minimum 3
30	Sikkim**	4		124			1	1	2	
31	Tamilnadu	31	24422	7175	9.1	7.1	1	5	6	
32	Tripura	4	291	478			1	1	2	
33	Uttar Pradesh	70	25385	11254	9.1	15.3	1	8	9	
34	Uttarakhand	13	3633	1353	0.5	0.4	1	1	2	
35	West Bengal	19	15891	3126	13.0	8.7	1	2	3	Minimum 3
	Others				0.3	0.2				
		617	293767	126768	92.6	99.7	33	70	103	

* Actually nine districts, treated here as one
** No EMI Programme

a) In States, where there are only one or two districts, all are selected
b) In States, where more than two districts are there, but the share of Agriculture Graduates as per 2001 census is less than one per cent, only two districts are allocated
c) In other States, the number of districts allocated follows the percentage of share of agricultural graduates in the State, subject to:
d) The minimum number allocated to a State is three districts
e) The total number allocated to any State is limited to 20 per cent of the total number of districts in the State
f) In Bihar, the number of Agriculture Graduates from Census appears doubtful with almost 9500 in just Muzaffarpur district. Hence, the allocation is limited to 10% of the total number of districts

State-wise Selection of Districts

The total ultimate sample size for the establishment surveys is fixed at about 4500 establishments from about 100 districts. At the first stage, districts are selected as per the sampling norms. The selection of the sample of districts in each State is done in the following manner.

In each State, the district in which State capital is located is selected first. This is because, several of the State Agricultural Universities, ICAR research institutes, head quarters of State departments dealing with agriculture and allied subjects and major industrial head offices are located in the capitals.

In small States and union territories with one or two districts, the selection of individual districts is automatic.

In States with more than three districts, but with limited presence of agricultural manpower, two districts are covered, one being the State capital and another district chosen randomly from out of the remaining districts with probability proportion to size of agricultural and veterinary graduates in the district. Twenty eight districts selected on this basis.

In States to which 3 or more districts have been allocated, all the districts other than the capital district have been stratified on the basis of the number of agricultural and veterinary graduates. In most States, two strata were formed, with districts having 250 or more graduates forming one stratum and the remaining districts constituting the second stratum. In a few States, the cut off point for forming strata was 500 and in the case of Rajasthan it was only 100, as none of the districts other than Jaipur had over 250. In Maharashtra, the number of graduates was high in many districts. As such, three strata were formed, those having 1000 or more, those having 500 to 999 and those having less than 500. In all cases, the number of districts allotted to the State was split between the strata equally, and where that is not possible, with a higher share for the bigger districts. The requisite number of districts has been selected from each stratum according to simple random sampling without replacement.

The total number of districts selected from the entire country is, thus, 103.

Frames of Establishments in the Selected Districts for Second Stage Sampling

Before sampling establishments in the selected districts, frames (lists) of all establishments from which sampling can be done was prepared. This being the list of establishments in the organized sector[2] available on the Employers' Register maintained by each district Employment Exchange under the Employment Market Information (EMI) programme. This register classifies all establishments covered by the EMI programme in the district into those in public sector (Central Government/State Government/Quasi-Government Organizations/ Local Bodies separately) and those in private sector (establishments with 10 to 24 employees and those with 25 or more workers separately). Within each category, both in the public sector and in private sector, the establishments are further classified by the industrial activity. These lists are taken as a starting point for establishments in the organized sector. They are further improved to ensure completeness by consulting the District Industries Centre, associations of industries and other sources.

The lists of establishments prepared are divided in to three categories based on employment potential/ demand for agricultural manpower. They are establishments with a) high potential b) medium potential and c) others.

The first category of establishments comprises of:

- Agricultural/ horticultural/ animal husbandry/ forestry/ fishery and such activities (including plantations, floriculture, aqua-culture, etc.)
- Extension work and support services in agriculture and allied fields
- Research and developmental activities in agriculture and allied fields both in government, autonomous or private sector.
- Government services in agriculture and allied fields

[2] Organized sector for the purpose of EMI programme comprises all establishments in the public sector and all establishments in the private sector employing 10 or more workers.

- Veterinary services and hospitals

The second category includes:

- Agro-industries (including processing of sugar, tobacco, cotton etc)
- Manufacturing industries linked to agriculture like fertilizers, pesticides, agricultural equipment (like tractors, threshers, etc.)
- Wholesale and retail trade in agriculture and allied fields
- Financial institutions engaged in lending to agriculture and allied fields

All other establishments are included in the third category.

Apart from establishments, graduates are also needed for Non-Government Organizations (NGOs) engaged in activities relating to agriculture (such as organic farming, consultancy in agriculture, extension work, agricultural marketing, etc.). A list of such NGOs available from Centre for Advancement of Rural Technologies (CAPART), Government of India and subsequently improved through local consultations is prepared and used for sampling NGOs.

There may be other smaller establishments engaged in activities relating to agriculture and allied fields. There may also be self-employed graduates in agriculture and allied sciences in the district (e.g. Agri-clinics and agri-businesses). A list of these was obtained from the local knowledgeable sources and financial institutions (who provide assistance to agri-clinics and businesses). The lists, so prepared, are the basis for sampling of establishments, NGOs and self-employment units.

Sample Size for the Second Stage Units (establishments within selected districts)

In each district, the establishments were selected in proportion to their strength based on their size and number of graduates employed. As a general rule, the following sampling fractions was adopted for different strata may be larger in districts with larger number of establishments relevant for graduates in agriculture and allied disciplines, and smaller in other districts.

Selection of Establishments in a District for Survey

SNo	**Establishment category** (based on intensity for employment of agricultural manpower)	**Share %**	**Number of establishments selected**
1	Establishments with high intensity for	50	20
2	Establishments with medium intensity	10	20
3	Others (inclusive of self-employed & NGOs)	5	10
	Total		50

From each stratum, the requisite number of establishments is selected systematically with a random start.

Annexure-3.5

S.No. | | |

INSTITUTE OF APPLIED MANPOWER RESEARCH
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NATIONAL ACADEMY OF AGRICULTURAL RESEARCH MANAGEMENT
Hyderabad

ASSESSMENT OF FUTURE HUMAN CAPITAL REQUIREMENTS IN AGRICULTURE
(Sponsored by NAIP, ICAR)

(Questionnaire 1: Organizations /Departments /Establishments)

Note:

Dear Sir/Madam,

- This questionnaire is self-explanatory and would take about 30 minutes to fill up.
- The information given by you would be extremely helpful in forecasting the demand of employment in the agricultural sectors and revising educational curriculum.
- Wherever possible, please choose from the given codes.
- You are free to give your opinions wherever asked.
- Information given by you would be used for academic purposes and policy modifications.
- Please answer all the questions. If answer for any question is nil, put a dash (-). In case space for any question is not adequate, please use vacant spaces.

State

District

Type of establishment*

* Crop production (including plantation) -01, Plantation -02, Fisheries -03, Dairying and animal husbandry -04, Forestry -05, Manufacturing -06, Trading -07, Financial Institutions -08, Government office-09, Non-governmental organizations-10, Research and other educational institutions -11, Others (pleas specify) -12

I. IDENTIFICATION PARTICULARS

1.1 Name of the establishment……

Address…….

Name of the contact person …….

Designation……..

Telephone No…….. Fax No……..

E mail address…….

1.2 Head office or Branch Office: *Head Office 1 Branch Office 2* [ ]
1.3 Location*: Urban [1] Rural [2]* [ ]
1.4 Year of establishment…….
1.5 Type of ownership [ ]

Government -1, Other Public sector -2, Joint sector-3, Cooperatives -4, Private sector (other than coop and self-employed) -5, Self-employed -6

1.6 Major Activity .....……
Others …… ……. ……..

1.7 Operational details

Year	**(Manufacturing units) Total value of production (Rs)**	**(Other organizations) Total annual expenditure (Rs)**	**Total Employment**

II. Employment of Agriculture and Allied Persons

2.1 Please give the following details of your employees (1st April 2009)

Educational Level	**Total**	**Women**
Certificate holders in agriculture and allied fields		
Diploma holders in agriculture		
Graduates in agriculture and allied fields		
Other Graduates		
Informal training holders in agriculture and allied fields		
Others (Pl. specify)		

2.2 *Please provide the details of all graduates and above in agriculture and allied sciences employed as on 1 April 2009 (including owners and partners)

Designation (by level of Positions)	Qualifications	Discipline	No. of persons		Nature of work	Gross Emoluments
			Males	Females		

* Note

Designation*: As per the designations in the organization*
Qualifications: *Graduate/Post-graduate/Doctorate/Diploma/Certificate*
Discipline*: Agriculture, Horticulture, Bio-technology, fishery, dairy etc.*
Nature of work*: Administrative and managerial, research and or teaching/extension, other professional or technical work, clerical, sales or marketing, production process work, others(Please specify)*

2.3 Please provide details of all graduates and above in agriculture and allied sciences in your organization during the last 5 years according to their discipline

Discipline	No. of employees who are graduates or above in the discipline as on 1 April				
	2005	2006	2007	2008	2009

2.4 No. of vacancies arising for graduates and above in agriculture and allied fields

Year	Number of vacancies arising due to					Number of vacancies filled
	Retirements	Transfers/resignations	Expansion	Other reasons	Total Vacancies	

2.5 Do you find it difficult to fill the vacancies with the persons with agricultural qualifications?

Yes /No

2.6 Please give the following details of vacancy positions

Discipline	Qualifications level required (graduate/post-graduate/Doctorate)	No. of vacancies which could not be filled			Reasons for not being able to fill
		2006-07	2007-08	2008-09	

2.7 Do you employ persons with other qualifications in jobs where qualification in Agriculture and allied fields are needed?

Yes/No

2.8 If yes, please give the reason

- Shortage of agricultural graduates
- Demand of high salary
- Agricultural graduates not needed
- High labour turnover
- Any other (Pl. specify)

2.9 Please indicate the important changes that have taken place in your organization and the new skills required, if any, during the last 5 years.

Nature of change	Whether the change took place (Yes/No)	Whether the change required new skills(Yes/No)	Nature of skills needed	How difficult was it to obtain these skills*
Expansion of the organization				
Diversification of product/service				
Technology of production				
Computerization				
Others (specify)				

* Very difficult -1 hard -2 Easy -3

III. DEVELOPMENT PERSPECTIVE OF ORGANIZATION

3.1 Kindly indicate the future plans of the organization

Nature of change	**By 2015**	**By 2020**	**Details of change and skill requirement**
Expansion of the organization			
Diversification of product/service			
Technological changes in production process			
Modernization of organization (e.g. computerization)			
Others (specify)			

3.2 What would be the expected total employment in your organization.

a) By 2015…….. b) By 2020…….

3.3 Please indicate the total number of graduates and above likely to be in your organisation

Discipline	1st April 2009				In 2020			
	UG	PG	PhD	All	UG.	PG	PhD	All

IV. SKILL GAPS

4.1 In your opinion, do the university/ college graduates and post-graduates in agriculture and allied fields meet the skill requirements of your organization?

Fully ☐ Partly ☐ Not at all ☐

If not fully met, what type of skills needed? (You can tick more than one answer)

Particulars	UG level	PG Level
a) more advanced theoretical knowledge		
b) more technical knowledge		
c) more practical orientation		
d) more interaction with industries		
e) managerial skills		
f) Information technology		
g) agri- business economics		
h) any other (pl. specify)		

4.2 Do you conduct any training to raise the skills of fresh recruits to the required level?

Yes ☐ No ☐

If yes give details of such programmes or attach the list of programmes organised

…….

4.3 Describe changes required in the present university education in agriculture and allied fields

A) Changes required in theory/practical ratio Yes/No

If Yes what ratio is needed in UG curriculum

Discipline	Ratio required	
	Theory	Practical

B) Changes needed in curriculum of UG

Discipline	Course Content	**Changes required**				
		Managerial Skills	IT Skills	Communication Skills	Entrepre neurial	Others (Specify)

C) Changes needed in PG level curriculum

……

4.4 In your opinion, what new courses require to be introduced in agricultural universities/colleges in the light of future trends :

a) UG Level……

b) PG Level…….

4.5 In your opinion which agricultural and allied sectors have potential for employment in future and what types of skills would be needed.

……...

Place ……. Date …….

Name of the Investigator…….. Signature of the Investigator……..

Name of the Supervisor…… Signature of the Supervisor…….

Comments of the Investigator

Annexure-3.6

Institutional Code ☐

(Central university- 1, State agricultural universities – 2, Agricultural colleges- 3, Other colleges-4, ICAR research institutions- 5, Other research institutions -6)

S. No ☐☐☐

INSTITUTE OF APPLIED MANPOWER RESEARCH
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A-7, Institutional Area, Narela, Delhi 110 040
&
NATIONAL ACADEMY OF AGRICULTURAL RESEARCH MANAGEMENT
Hyderabad

ASSESSMENT OF FUTURE HUMAN CAPITAL REQUIREMENTS IN AGRICULTURE – sponsored by NAIP - ICAR

(Questionnaire 2: Agriculture and Allied Universalities/ Institutions/ Colleges)

Dear Sir/Madam,

- This questionnaire is self-explanatory and would take about 40 minutes to fill up.
- The information given by you would be extremely helpful in forecasting the demand of employment in the agricultural sectors and revising educational curriculum.
- Wherever possible, please choose from the given codes.
- You are free to give your opinions wherever asked.
- Information given by you would be used for academic purposes and policy modifications only.
- Please provide any printed documents available about your institution such as Vision 2020, Annual Reports for the past ten years etc.

State ☐ District ☐

I. IDENTIFICATION PARTICULARS

1.2 Name of the Institute/University/College……..

Address …….

1.3 Name of the head of the institution…….
Designation……..

1.4 Name of the contact person……..Designation…….
Phone No…… E-mail…….Fax No……

1.4 Type of institution: □
(Teaching 1, Research 2, Extension-3, All (teaching, research & extension) - 4, Others - 5)

1.5 Year of establishment: …….

1.6 Regular staff (University as a whole including all departments and University colleges/Constituent colleges)

Year/Qualification		**Teaching/Research /Extension**		**Others (Technical)**		**Non-technical***		**Total**	
		Total	Female	Total	Female	Total	Female	Total	Female
1st April 2005	Graduate & above in agriculture and allied field								
	Others								
	Total								
1st April 2009	Graduate & above in agriculture and allied field								
	Others								
	Total								

* Non-technical includes administrative, ministerial and support staff.

1.7 Budget and Expenditure (2004 to 2009)

Year	**Budget (Rs.)**	**Expenditure (Rs.)**

1.8 Intake of Students

Please provide the following information on student intake for the academic year 2009-10. Similar data may please be provided w.e.f. 2000-01 to 2008-09(year-wise). Attach separate sheet.

Courses offered	Level	No. of seats	No. of applications received	Final intake by location and sex wise			
				Rural		Urban	
				Male	Female	Male	Female

1.9 Teaching, Research and Extension Staff

Please provide the following details about the teaching and research staff as on 1st April 2009

Discipline	**Sanctioned strength as on 1st April, 2009**	**Number in position as on 1st April 2009 by level of qualifications**			
		UG	**PG**	**PhD**	**Total**

1.10 Future Expansion

Please provide the information on future plans of the university/college (over the next ten years (Please attach vision document)

Future plan	**Details**				
	Departments	Nature of expansion	By 2015	By 2020	Types of skill requirements
1. Expansion					
2.Technological Upgradation					
3. Modification of Curriculum					
4. Closure					
5. Others (specify)					

1.11 Indicate the total number of graduates and above likely to be in your organization

Discipline	**1st April 2009**				**In 2020**			
	UG	PG	PhD	All	UG.	PG	PhD	All

II COURSE/CURRICULUM MODIFICATIONS

2.1 Provide the information on the new courses introduced and courses discontinued in the university /college during the last 5 years at under graduate and post-graduate level.

Name of the course introduced/discontinued	Level	When the course introduced/ Discontinued	Reasons for introduction/discontinuation
I. New courses introduced			
II. Courses discontinued			

2.2 Please indicate if there is any change in curriculum in any course during **the last 5 years for under graduate and post-graduate**

Name of the courses	Level	Discipline/subjects in which curriculum changed	Year of change	Reasons for change

2.3 How was the curriculum revised? (You can select more than one answer)

a) Deans committee report
b) Interaction with faculty
c) Through brain storming session with experts in the field
d) Interaction with industry
e) Consultation with other universities
f) On own
g) Any other (please specify)
h) All together

2.4 Describe changes required in the present university education in agriculture and allied fields

A) Changes required in theory/practical ratio Yes/No

If yes what ratio is needed in UG curriculum

Discipline	**Ratio required**	
	Theory content	**Practical Orientation**

B) Changes needed in curriculum of UG

Discipline	Course content	**Changes required**				
		Managerial Skills	IT Skills	Communication Skills	Entrepreneurial	Others (Specify)

C) Changes needed in PG level curriculum

……..

2.5 In your opinion, what new courses require to be introduced in agricultural universities/colleges in the light of future trends :

c) UG Level……
d) PG Level…….

III. PASSED OUT TRAINEES : Out-turn of graduates, post-graduates and Ph.Ds.

3.1 Pleases provide, the following information about the 2008-09 passed out students. Please also provide similar data for the years beginning for 2000-01 to 2007-08.

Discipline	Level	Number of students passed out		Status of the passed out students			
		Total	Females	No. of students joined higher studies	No. of students joined employment	No. of students went abroad	Others *

Note: *Others may include who have taken up their own business/self –employment etc.

IV. SKILL GAPS

4.1 In your opinion, are there any gaps in skill levels between the outturn of your Institution and requirements of the industry? Yes / No

4.2 If yes, in what disciplines and nature of gaps

Discipline	Skill gaps

4.3 How do you propose to address these gaps……..

V. EMPLOYMENT

5.1 For those going in for employment

a) What are the main industries absorbing the alumni? (Pl. list the leading industries)

……. …… ……

b) Nature of jobs in which absorbed

……. …… ……

5.2 Is there any campus recruitment? Yes / No

If Yes, which are the employers: (Please attach list leading industries)

Year	No of employers visited for campus recruitment
2005-06	

5.3 Does the university have a placement cell? Yes / No

If Yes, please indicate the number of passed out students placed in the last three years

Level	***Discipline***	**No. of passed out students placed in**			**Industries in which placed**	**Average time taken to place after completion of course (months)**
		2006-07	2007-08	2008-09		

5.4 When the placement cell was set up? ……..

5.5 Did you use mass media to publicize your placement cell? Yes/No

VI. POSTS:

6.1 Whether number of post increased/decreased in any discipline during the last three years? Yes/No

If yes please provide the details

Discipline	**Sanctioned Strength as on**		**Reasons for the change**
	1st April, 2006	**1st April, 2009**	

6.2 Vacancies of teaching and research/extension staff

Discipline	**Total no. of vacancies**	**No. of vacancy could not be filled**				**Reasons for vacancy**
		Qualification needed	2006-07	2007-08	2008-09	

6.3 Number of staff retiring/leaving each year.

Discipline	**No. of teachers/ scientists retiring/ leaving the institution**					**Reasons**
	2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**	

6.4 Do you find any difficulties in finding teachers/researchers/extension service providers of the standard required? Yes/No

If yes, please indicate the fields/disciplines

i) ……. ii) ……..

iii) …….. iv) …….

6.5 What, in your opinion, is the reason for the shortage? (more than one reason may be given)

a) Good candidates go abroad
b) Good candidates to go private industry
c) Good candidates go for self-employment
d) Good candidates to join other fields
e) Higher salaries in other institutions
f) Others (please specify)

VII. INTERACTION WITH INDUSTRY /EXTENSION WORKERS/FARMERS

7.1 Does your organization have any interaction with industry? Yes / No
If Yes, nature* …….
(*Giving practical exposure at the industry to the students, sharing of technology etc)
Number of MoUs signed with the Industries…….
Number of projects undertaken in collaboration with Industries ……

7.2 Do you have interaction with extension workers? Yes / No
If yes, nature…….
Frequency…….

7.3 . Do you have any interaction with farmers? Yes / No
If yes, nature…….
Frequency…….

7.4 Do you have any interaction with NGOs? Yes / No
If yes, nature…….
Frequency…….

7.5 Is there any need to improve the interaction and its efficacy? Yes / No

7.6 If yes, your suggestions on how the interaction can be improved
……

7.7 Number of awareness creation programmes organized for employment in the last two years. (Attach list)

7.8 Number Agro-clinics/Agri-business Centres/Self-employed Units promoted by University

7.9 What activities are being organized to help self-employed alumni?

7.10 In your opinion which agriculture and allied sectors have potential for employment and what types skills would be needed

……

Place: **Signature of Investigator**

Date Name of Investigator

Name of Supervisor **Signature of Supervisor**

Investigator's comments

Supervisor's comments

Annexure-3.7

Serial No. of Establishment - | | | | | |

Serial No. of Employee - | | | |

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NATIONAL ACADEMY OF AGRICULTURAL RESERCH MANAGEMENT
(HYDERABAD)

ASSESSMENT OF FUTURE HUMAN CAPITAL REQUIRMENTS IN AGRICULTURE
(Project under NAIP-ICAR)

Questionnaire - 3 : Individual Employees – Only who has education in Agriculture and allied sectors

Dear Sir/Madam,

- This questionnaire is self-explanatory and would take you about 20 minutes to fill up.
- The information given by you would be extremely helpful in forecasting the demand of employment in the agricultural sectors and revising educational curriculum.
- Wherever possible, please choose from the alternative answers/ codes given against the item.
- You are free to give your opinions wherever asked.
- Information given by you would be used for academic purposes only.

I. IDENTIFICATION PARTICULARS OF ESTABLISHMENT

1.1. State …… | | |

1.2 District …… | |

1.3 Name and address of establishment in which employed

a) Name of establishment……

b) Address……

II. GENERAL INFORMATION

2.1 Your Name……

2.2 Sex Male □ Female □

2.3 Age (in completed years) ☐☐

2.4 Social Category (Please tick in the appropriate box)

SC □ ST □ BC □ General □ Others □

2.5 Do you belong to urban or rural areas? Urban □ Rural

2.6 Education **:** ☐

Please give details of all qualifications in the following table. (If needed please attach a separate sheet)

Course level	Discipline	Year awarded	Name of the Institution/University
Diploma			
Graduation			
Post-graduation			
Ph.D			
Graduation in any additional field			
Any other(Please specify)			

III. DETAILS OF EMPLOYMENT

3.1 Please provide the following details about your present and past employment.

Organization with Address (Start with present employment)	Main activity of organization	Duration of employment		Post held	Nature of work*	Reason for leaving	Total emoluments per month last drawn (in Rs)
		From	To				

Note: * Nature of work: Administrative and managerial, research and or teaching/extension, other professional or technical work, clerical, sales or marketing, production process work, others(Please specify)

3.2 Details of job-related training received in the last three years

a) Have you been given any job training of 1 or more months? Yes □ No □

b) If yes, provide the following information.

Major subject area of training	Duration (in months)	Place of training (within establishment -1, training institution -2, others -3)	Year in which received training

3.3 How much time did it take to get employment after completing your studies? ☐

Immediately -1, Within six months-2, 6 months or more but less than 1 year -3,
1 year or more but less than 2 years – 4, More than 2 years- 5

3.4 a) Did your institution have a Placement Cell? Yes/No

b) If yes, what help did you receive from the cell……

3.5 How did you get the job? ☐

Campus interviews -1, Agricultural Scientists Recruitment Board -2, Other competitive examinations -3, Open job advertisements -4, Direct interviews -5, Promotion -6, Transfer -7, Any other (please specify) -8

IV. VIEWS ON EDUCATION RECEIVED

4.1 Why did you go in for a degree in agricultural/allied sciences? ☐

Codes: Interest in the subject (1), Best professional degree as per your qualification –(2), More employment opportunities in the sector – (3), Family pressure –(4), No specific interest in the subject, but a professional degree is useful for competitive examinations –(5), Others (specify) – (6)

4.2 In your opinion, is the education provided at the agricultural university/institution adequate with the requirements of the employment market?

Fully adequate ☐ Partially adequate ☐ Not at all adequate ☐

4.3 If partly or not at all adequate, what should be included in the curriculum?

a) more advanced theoretical knowledge Yes/No
b) more technical knowledge Yes/No
c) more practical work Yes/No
d) more interaction with industries Yes/No
e) managerial skills Yes/No
f) information technology Yes/No
g) agri-business economics Yes/No
h) any other (pl. specify)

4.4 Mention the courses and subjects that need to be strengthened or added or discontinued

To be strengthened		To be added		To be discontinued	
Courses	Reasons	Courses	Reasons	Courses	Reasons
1		1		1	
2		2		2	

4.5 In your opinion which courses in agriculture sector have better job prospects?

4.6 Any other information you may like to add regarding education in agriculture and allied fields.

Thanks for sparing your valuable time

Investigator's comments

Supervisor's comments

Place: Name of the Supervisor……..

Annexure-3.8

Sample Serial No. ……

INSTITUTE OF APPLIED MANPOWER RESEARCH
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NATIONAL ACADEMY OF AGRICULTURAL RESERCH MANAGEMENT
(HYDERABAD)

ASSESSMENT OF FUTURE HUMAN CAPITAL REQUIRMENTS IN AGRICULTURE
(Project under NAIP-ICAR)

Questionnaire : Tracer' s Studies

Dear Sir/Madam,

- This questionnaire is self-explanatory and would take you about 20 minutes to fill up.
- The information given by you would be extremely helpful in forecasting the demand of employment in the agricultural sectors and revising educational curriculum.
- Wherever possible, please choose from the alternative answers/ codes given against the item.
- You are free to give your opinions wherever asked.
- Information given by you would be used for academic purposes only.

I. SAMPLE IDENTIFICATION PARTICULARS (To be filled by the survey staff)

1.1. State …… | | |

1.2. Name of university/college from which selected

a) University……. | | |
b) College……. | | |

1.3. Year from which selected…… | | | | |

1.4. Graduate – 1, Post-graduate - 2, Doctorate – 3 Diploma-4, Certificate-5. | |

1.5. Discipline/branch……

II. GENERAL INFORMATION

2.1 Name……
2.2 Sex Male □ Female □

2.3 Age (in completed years) | |
2.4 Social Category SC□ ST □ BC □ General □ Others □
2.5 You belong to Urban Area □ Rural Area □

2.6 Education **:**

Please give details of all qualifications. If you are still studying or doing research, please enter 'continuing' under col.3 against the relevant course

Course/level	**Discipline**	**Year Awarded**	**Name of the Institution/ University**
Diploma			
Graduation			
Post-graduation			
Ph.D			
Graduation in any additional fields			
Any other(Please specify			

III. PRESENT ACTIVITY

3.1 What is your present activity? |

Employed on salary 1, Self-employed -2, Looking for Work- 3,
Student -4, Doing research – 5, None of these -6

3.2 If you are not employed now, have you ever been employed since graduation?

Yes/No

IV. DETAILS OF SALARIED EMPLOYMENT

4.1 Please provide the following details of your present and past **<u>salaried employment</u>**.

Organisation with address (start from present employment)	Main activity of organisation	Duration of Employment		Post held	Nature of work	Reason for leaving	Total emoluments per month (in Rs.)
		From	To				

4.2. Training courses attended in the last three years

Have you been given any job training of one month or more Yes □ No □
If yes, provide the following information.

Major Subject Area of training	Duration in months	Place of training	Year in which received training

4.3 Did your university/college have any placement cell? Yes / No
If Yes what help did you receive from the cell?

……..

4.4 How did you get the present employment? ☐

*Campus interviews -1, Agricultural Scientists Recruitment Board -2, Other competitive examinations -3, Open job advertisements -4, Direct interviews -5,Promotion -6, Transfer-7 ,Other means -8

4.5 How much time did it take to get employment after completing your studies? ☐

Immediately-1, Less than six months-2, 6 months to 1 year -3, 1 year or more but less than 2 years - 4, 2 years or more - 5

4.6 Do you think that what you have studied in the university was adequate in getting a job?
Fully adequate □ Partly adequate □ Not at all □

V. DETAILS OF SELF-EMPLOYMENT

5.1 If you are self-employed, please provide the following details

i) Name of the unit …….

ii) When did you start the unit (month and year)……

iii) Type of activity…….

iv) Reasons for choosing self-employment ☐
1) Own interest
2) family business
3) lack of salaried jobs
4) Better opportunities for growth
5) Others (specify)

v) Is the activity taken up under any specific government schemes? Yes/No

vi) If yes, name of the scheme

vii) Is there sufficient demand of your product/ work? Yes /No

viii) Any problems faced……
No problems -1, Lack of demand for the product/service -2,
Raw materials -3, Power – 4, Other inputs -5, Technical know how -6,
Marketing-7, Others (specify) -8

ix) What is the total initial investment in the unit
a) Own funds Rs……..
b) Assistance/loan from financial institutions Rs……

x) What is the net annual income from the unit during

2007-08 Rs…….. 2008-09 Rs……

VI. DETAILS OF UNEMPLOYMENT

6.1 If you are not employed or studying, are you looking for a job? Yes/No

6.2 If Yes,

a) Since when are you looking for a job? Year and month ----------

b) Type of job looking for ----------

Job in the agricultural/allied fields in government -1, Other government jobs -2,
Research institutions -3, Financial institutions -4, Private industry -5, Teaching-6,
NGOs -7, Others -8, Any job -9

c) What do you think are the reasons for not getting a job?

Lack of job openings of the type preferred -1, Lack of opportunities in the locations preferred -2, Gaps in technical skills taught in the university and what is demanded in the market -3, Gaps in practical skills -4, Lack of communication skills 5, Others (specify) – 7

6.3 In your opinion what else should be taught in the colleges/institutions to increase employability or suitability towards job?

……

6.4 Are you interested in self-employment? Yes/No

6.5 If yes, have you made any attempts? please specify----------

6.6 If you are not employed and also not looking for a job, why?.....

VII. VIEWS ON EDUCATION RECEIVED

7.1 Why did you go in for a degree in agricultural/allied sciences? ☐

Interest in the subject 1, Best degree as per my qualification -2, More employment opportunities in the sector – 3, Family pressure -4, No specific interest in the subject, but a professional degree is useful for competitive examinations -5, Others (specify) – 6

7.2 In your opinion, does your education at the agricultural university/institution adequate with the requirements of the employment market?

Fully adequate ☐ Partially adequate ☐ Not at all adequate ☐

7.3 If partly or not at all adequate, what should be included in the curriculum?

h) more advanced theoretical knowledge Yes/No
i) more technical knowledge Yes/No
j) more practical work Yes/No
k) more interaction with industries Yes/No
l) managerial skills Yes/No
m) information technology Yes/No
n) agri-business economics Yes/No
h) any other (pl. specify)

7.4 Mention the courses and subjects that need to be strengthened or added or discontinued

To be strengthened		To be added		To be discontinued	
Courses	Reasons	Courses	Reasons	Courses	Reasons

7.5 What are your future plans……..

7.6 In your opinion which courses in agriculture sector have better job prospects?

……

7.7 In your opinion what should be done to attract youth towards agricultural sector

……

7.8 Any other you may like to add regarding education in agriculture and allied field

……

Thanks for sparing your valuable time

Date: Name of the Investigator……
Place: Name of the Supervisor…….

Investigator's comments Supervisor's comments

Annexures for Chapter-4

Annexure-4.1

Demand and Supply Projections for Food Grains and Other Crops 2011-12

Crops	Demand Projections for 2011-12	Range of Production Supply Projections for 2011-12	Actual levels of production(Million Tonnes)					
			2006-07	2007-08	2008-09	2009-10 (4th Advance Estimate)	2010-11 (Target)	2010-11 (1st Advance Estimate)
1	2	3	4	5	6	7	8	9
Food grains	244[3]	214 – 240 (from alternate methods)	217.28	230.78	234.47	218.20	244.50 (125.31)	(114.63)
Oilseeds	53	45[4]	24.29	29.76	27.72	24.93	33.20 (20.70)	(17.27)
Sugarcane	340[5]	278 – 334 (from alternate methods)	355.52	348.19	285.03	277.75	315.00	32.49
Cotton[1]	29	16 -50 (from alternate methods)	22.63	25.88	22.28	23.94	26.0	33.5
Jute & Mesta[2]	10	11	11.27	11.20	10.36	11.29	11.50	10.28

[1] Million Bales of 170 kg each

[2] Million Bales of 180 kg each

[3] includes 2 million tones for augmenting buffer stock and average export of 8 million tones

[4] based on realization of potential yield. This supply assessment would improve self-sufficiency level in edible oils from existing 55% to 80%. However, if the level edible oil imports to meet the domestic demand is assumed to be retained at present level (4.& million tones) then the supply would require to be of 36 million tones of domestic production.

[5] includes 12 lakh tonnes of sugar for augmenting buffer stock and average export of 5.4 lakh tonnes

[6] Figures in brackets in col.8 are targets for Kharif only, and figures in col. 9 are first advance estimates of achievement for Kharif season.

Source: (1) Report of the Working Group on Crop Husbandry, Agricultural Inputs, Demand and Supply Projections and Agricultural Statistics for the Eleventh Plan,

(2) Directorate of Economics and Statistics, Ministry of Agriculture and Cooperation, Second Advance Estimates.

Annexure-4.2

Progress under National Horticultural Mission

Item	Unit	Achievement during	
		2005-06 to 2008-09	2009-10
1. Nurseries	No.	1,905	201
2. Area coverage	Lakh ha	12.79	2.96
3. Rejuvenation of senile orchards	Lakh ha	2.09	0.37
4. Organic farming	Lakh ha	1.03	0.17
5. Integrated Pest Management	Lakh ha	5.54	1.73
6. Integrated Nutrient Management			
7. Pack house	No.	662	153
8. Cold storage	No.	97	157
9. Markets	No.	134	83

Source: Ministry of Agriculture and Cooperation, Annual Report 2009-10

Annexure-4.3

Yearwise Sale of Agricultural Machineries

Year	Energization of pump sets	Tractors	Power tillers	Four wheel tractors	Threshers	Diesel pumps	Electric pumps
2001	12823480	173181	16891	2833755	4202000	6347800	17538300
2002	13043926	254825	16018	3025838	4542000	6816600	20312600
2003	13792427	256688	18544	3217922	4882000	7285400	23086900
2004	14057268	266446	19983	3410005	5222000	7754200	25861200
2005	14462768	276205	21422	3602089	5562000	8223000	28635500
2006	14868267	285963	22861	3794172	5902000	8691800	31409800
2007	15273767	295722	24300	3986255	6242000	9160600	34184100
ACGR	2.38	4.56	4.78	4.22	4.77	4.48	7.18

Source: Agricultural Research Data Book, 2008, ICAR up to 2007. Projections for subsequent years on the basis of relevant Annual Compound Growth Rate .

Annexure-4.4

Livestock Population in India (1972-2007)

Species	No. in the year							
	1972	**1977**	**1982**	**1987**	**1992**	**1997**	**2003**	**2007 (Provisional)**
Cattle	178.30	180.00	192.45	199.69	204.58	198.88	185.18	**199.08**
Buffalo	57.40	62.00	69.78	75.97	84.21	89.92	97.92	**105.34**
Sheep	40.00	41.00	48.76	45.70	50.78	57.49	61.47	71.56
Goat	67.5	75.6	95.25	110.21	115.28	122.72	124.36	**140.54**
Horses & ponies	0.90	0.90	0.90	0.80	0.82	0.83	0.75	**0.60**
Camels	1.10	1.10	1.08	1.00	1.03	0.91	0.63	1.10
Pigs	6.90	7.60	10.07	10.63	12.79	13.29	13.52	7.60
Mules	0.08	0.09	0.13	0.17	0.19	0.22	0.18	0.09
Donkeys	1.00	1.00	1.02	0.96	0.97	0.88	0.65	**0.44**
Yak	0.04	0.13	0.13	0.04	0.06	0.06	0.06	**0.08**
Total Livestock	**353.60**	**369.00**	**419.59**	**445.29**	**470.86**	**485.39**	**485.00**	**529.70**
Poultry	138.50	**159.20**	**207.74**	**275.32**	**307.07**	**347.61**	**489.01**	**648.83**
Dogs	NC	NC	18.54	17.95	21.77	25.48	29.02	**19.09**

Source: Department of Animal Husbandry, Dairying and Fisheries: Animal Husbandry Statistics 2008, and Provisional Results of Livestock Census, 2007

NC= Not classified

Proportion of Cross-bred Cattle in the Total Cattle Population (1987-2007)

Percentage of Cross bred cattle	1987	1992	1997	2003	2007
	5.7	7.4	10.1	13.3	16.6

Annexure-4.5

Estimates of Production and Per Capita Availability of Milk (1950-51 to 2008-09)

Year	Production of milk (million tonnes)	Per capita Availability (gms. Per day)
1950-51	17	124
1955-56	19	124
1960-61	20	124
1968-69	21.2	112
1973-74	23.2	112
1979-80	30.4	127
1980-81	31.6	128
1981-82	34.3	136
1982-83	35.8	139
1983-84	38.8	147
1984-85	41.5	154
1985-86	44.0	160
1986-87	46.1	164
1987-88	46.7	163
1988-89	48.4	166
1989-90	51.4	173
1990-91	53.9	176
1991-92	55.7	178
1992-93	58.0	182
1993-94	60.6	187
1994-95	63.8	194
1995-96	66.2	197
1996-97	69.1	202
1997-98	72.1	207
1998-99	75.4	213
1999-2000	78.3	217
2000-01	80.6	220
2001-02	84.4	225
2002-03	86.2	230
2003-04	88.1	231
2004-05	92.5	233
2005-06	97.1	241
2006-07	100.9	246
2007-08	104.8	252
2008-09*	110.0	261

* Anticipated achievements

Source: Department of Animal Husbandry, Animal Husbandry Statistics, 2008

Annexures for Chapter-5

Annexure-5.1

List of Agricultural Colleges in India

State	University	College/faculty
Andhra Pradesh	Acharya N. G. Ranga Agricultural University (ANGRAU), Rajendranagar, Hyderabad, 500030	1. College of Agriculture (ANGRAU), Rajendranagar, Hyderabad 500030. 2. S.V. Agricultural College (ANGRAU), Tirupati 517502, Chittoor District 3. Agricultural college (ANGRAU), Bapatla 522101, Guntur District 4. Agricultural College (ANGRAU), Aswaraopet, Khammam District 5. Agricultural College (ANGRAU), Nandyal (Mahanandi), Kurnool District 6. Agricultural College (ANGRAU), Naira, Srikakulam District 7. Agricultural college, Jagtial. 8. Agricultural college,Rajahmundry.
Assam	Assam Agriculture University (AAU) Jorhat, 785013	9. Biswanath College of Agriculture (AAU), Biswanatha Chariali, Dist Sonitpur 10. College of Agriculture (AAU), Jorhat 785013, Assam
Bihar	Bihar agricultural University Sabour	11. College of Agriculture, Dumraon, Buxar 12. Bihar agriculture college, Sabour 13. Faculty of Agriculture , Pusa, Samastipur
	Rajendra Agricultural University, Pusa Samastipura.	14. Mandan Bharti Agricultural College, Agwanpur, Saharsa 15. Tirhut College of Agriculture, Dholi, Muzaffarpur 16. BholaPaswanShashtri College of Agriculture, Purnea
Chhattis-garh	Indira Gandhi Krishi Viswavidyalay, Raipur 492012	17. College of Agriculture, Raipur
Delhi	IARI, New Delhi	18. PG School, New Delhi
Gujarat	Anand Agricultural University (AAU), Anand	19. B.A. College of Agriculture (AAU), Anand 388110, Gujararat
	Junagadh Agricultural University (JAU), Junagadh Gujarat 362001	20. College of Agriculture (JAU), Junagadh 362031
	Navasari Agricultural University (NAU), Navsar 396450	21. N.M. College of Agriculture (NAU), Navsari 396450

	Sardar Krushinagar Dantiwada Agricultural University (SDAU), Sardar Krushinagar,	22. C.P. College of Agriculture (SDAU), Sardar Krushinagar 385506, Banaskantha Dist
Haryana	Ch Charan Singh Haryana Agricultural University (HAU) Hisar**,** 125004	23. College of Agriculture , Hisar 125004, Haryana 24. College of Agriculture , Kaul, Kaithal Dist
Himachal pradesh	Ch. Sarwan Kumar Krishi Vishwa Vidyalaya (CSKHPKV), Palampur	25. College of Agriculture , Palampur 176062, Dist Kangra
Jammu&kashmir	Sher-e-Kashmir University of Agricultural Sciences and Tech (SKUAST-Jammu),	26. Faculty of Agriculture , R.S.Pura, Jammu
	Sher-e-Kashmir University of Agricultural Sciences & Tech. (SKUAST-Kashmir),	27. Faculty of Agriculture , Wadura, Sapore, Kashmir
Jharkhand	Birsa Agricultural University (BAU**)** **K**anke, Ranchi,-834006	28. Ranchi Agricultural College (BAU), Kanke, Ranchi
Karnataka	University of Agricultural Sciences, (UAS), Bangalor 560065	29. College of Agriculture, GKVK Campus, Bangalore 30. College of Agriculture, Hassan - 560065, GKVK 31. College of Agriculture, VC Farm, Mandya Dist-571405, 32. College of Agriculture, Shimoga Dist, Naveli – 577201
	University of Agricultural Sciences, (UAS), Dharwad	33. College of Agriculture, Bijapur Dist, 34. College of Agriculture , Krishinagar, Dharwad
	University of Agricultural Sciences, Raichur	35. College of agriculture, raichur-584 102 36. College of Agriculture, Bheemarayanagudi
Kerala	Kerala Agricultural University (KAU)	37. College of Agriculture, Vellayani P.O, Thiruvananthapuram 38. College of Agriculture , Padannakkad - Kasargode
Madhya pradesh	Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV) Jabalpur	39. College of Agriculture , Krishinagar Adhartal, Jabalpur 40. College of Agriculture , Mandsaur, Madhya Pradesh 41. College of Agriculture , Rewa, Madhya Pradesh
	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya RVSKVV,Gwalior	42. College of Agriculture, Gwalior 43. College of Agriculture, Sehore 44. College of Agriculture, Indore 45. College of Agriculture, Khandwa
Maha-rashtra	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (BSKKV**)** Dapoli, 415712	46. College of Agriculture , Dapoli, Dist Rathnagiri
	Marathwada Agricultural University, (MAU), Parbhani 431402	47. College of Agriculture, Krishi Nagar, Parbhani 48. College of Agriculture, Lathur, Latur Dist
	Mahatma Phule Krishi Vidyapeeth, (MPKV), Rahuri 413722, Ahmednagar	49. College of Agriculture, Badnapur, Jalna Dist 50. College of Agriculture, Ambajogai, Beed Dist 51. College of Agriculture, Osmanabad, Maharashtra 52. College of Agriculture, Dhule 53. College of Agriculture, Kolhapur - 416212,

		54. College of Agriculture, Shivajinagar, Pune
	Dr Punjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola, Maharashtra 444104	55. College of Agriculture, Akola - 444104, 56. College of Agriculture, Nagpur 57. College of Agriculture, At. Sonapur, Gadchiroli. 58. Shri Shivaji College of Agriculture, Amravati. 59. Anand Niketan College of Agriculture, Warora,Dist Chandrapur.
Mizoram	Central Agricultural University, Imphal	60. College of Agriculture, Iroisemba, Imphal
Orissa	Orissa University of Agriculture & Technology, Bhubaneswar	61. College of Agriculture, Bhubaneswar, Khurda 62. College of Agriculture, Chiplima, Sambalpur 63. College of Agriculture, Bhawanipatna
Punjab	Punjab Agricultural University, (PAU), Ludhiana, Punjab 141004	64. College of Agriculture, Ludhiana
Rajasthan	Rajasthan Agricultural University, Bikaner	65. College of Agriculture, Beechwal, Bikaner 66. SKN College of Agriculture, Jobner, Rajasthan 67. College of Agriculture, Lalsot
	Maharana Pratap Agriculture and Technology University, Udaipur	68. Rajasthan College of Agriculture, Udaipur
Tamil Nadu	Tamil Nadu Agricultural University (TNAU), Coimbatore, Tamil Nadu 641003	69. Agricultural College and Research Institute , Coimbatore 70. Agricultural College and Research Institute , Madurai 71. Agricultural College and Research Institute , Killikulam , Tuticorin Dist 72. Anbil Dharmalingam Agricultural College and Research Institute, Navalur Kattupattu, Trichy
Uttaranchal	Govind Ballabh Pant University of Agriculture and Technology (GBPAUT), Pantnagar, Uttaranchal 263145.	73. College of Agriculture (GBPUAT), Pantnagar 263145, 74. College of PG Studies (GBPUAT), Pantnagar 263145
Uttar Pradesh	Chandra Shekhar Azad University of Agriculture & Technology (CSAUT) Kanpur, Uttar Pradesh 208002	75. College of Agriculture , Kanpur , Uttar Pradesh
	Narendra Dev University of Agriculture and Technology (NDUAT, Faizabad 224229,UP	76. College of Agriculture, Kumarganj, Faizabad
	Sardar Ballabh Bhai Patel University of Agriculture Technology, Meerut, UP	77. College of Agriculture, Modhipuram, Meerut
	Allahabad Agricultural university, Allahabad	78. Faculty of agriculture, Allahabad
	Aligarh Muslim University (AMU), Aligarh,UP	79. Centre of agriculture, Aligarh
	Banaras Hindu University (BHU), Varanasi	80. Institute of Agriculture Sciences, Varanasi
West Bengal	Bidhan Chandra Krishi Vishva Vidyalaya, Nadia, West Bengal.	81. Faculty of Agriculture, Mohanpur, Nadia
	Uttar Banga Krishi Vishwavidyalaya (UBKVV), Cooch	82. College of Agriculture, Pundibari, Cooch Behar

	Bihar– 736165,West Bengal	
	Visva-Bharati, Santiniketan	83. Institute of Agriculture, Sriniketan, Brigham, West Bengal

Colleges Affiliated to State Agricultural Universities

Chhattisgarh	Indira Gandhi Krishi Vishwa Vidyalaya (IGKVV) Raipur, 492012	1. Shri Ram College of Agriculture, Rajnandgaon 2. Bhartiya College of Agriculture, Durg 3. Bhoramdev College of Agriculture, Kawardha 4. Chhattisgarh College of Agriculture, Bhilai, Durg 5. College of Agriculture, Ambagarh Chwoki 6. College of Agriculture, Dantewada 7. College of Agriculture, Raigarh 8. Mahamaya College of Agriculture, Dhamtari 9. Mardarshan College of Agriculture, Ambikapur 10. S.K. College of Agriculture, Kawardha
Maharashtra	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (BSKKV) Dapoli, 415712	11. Govindraoji Nikam Agriculture College, District Ratnagiri 12. College of Agriculture , Saralgaon , Tal. Murbad, District Thane 13. Chatrapati Shivaji Agriculture College, Kirlos, Tal. Kudal, Distri Sindhudurg 14. College of Agriculture, Sangulwadi, Tal.Vaibhavwadi ,District Sindhudurg 15. Kai. Rajaram Marathe College of Agriculure Phondaghat,District Sindhudurg. 16. Sharadchandrajee Pawar College of Agriculture, Kharavate Dahivali, Tal.Chipalun District Ratnagiri.
	Marathwada Agricultural University, (MAU), Parbhani 431402	17. Late Dadasaheb Patil College of Agriculture , Dahegaon, Tal Vaijapur, Dist Aurangabad 18. College of Agriculture, , Naigaon Bazar, Tal Naigaon, Dist Nanc 19. Rajiv Gandhi College of Agriculture , , Jintur Raod, Parbhani 20. Shri Chhatrapati Sahu Phule Ambedkar College of Agriculture, , Ashti, Dist Beed 21. College of Agriculture, Hingoli 22. Aditya College of Agriculture, Beed, Maharashtra 23. College of Agriculture, Kanchanwadi 24. CSMSS College of Agriculture, Kanchanwadi, Paithan Road, Tal. & District Aurangabad. 25. S.D.M.V.M's College of Agriculture,Gevrai Tanda, Paithan Road, Aurangabad. 26. College of Agriculture, Mahajan Complex, Nanded Naka, Nanded Road, At.post &Tal.Udgir, 27. College of Agriculture,(Kharpudi), Post Box No.45, Jalna
	Mahatma Phule Krishi Vidyapeeth, (MPKV), Rahuri 413722, Ahmednagar	28. College of Agriculture Akluj, Tal Malshiras, Solapur District 29. College of Agriculture Kadegaon, Sangli Dist 30. College of Agriculture ,Tal Newasa, Ahmadnagar Dist 31. Padmashri Dr Appasaheb Pawar College of Agriculture Baramati 32. College of Agriculture, Nasik 33. Krishna College of Agriculture, Tal Karad, Dist Satara 34. K.K. Wagh College of Agriculture Panchawati, Nasik. 35. College of Agriculture Banpuri, Tal Patan, Dist Satara 36. Loknete Mohanrao Kadam College of Agriculture, Sonsal Hingangaon, Tal.Kadegaon, DistrictSangli 37. College of Agriculture, Udoji Maratha Boarding Campus, Gangapur Road, Nasik. 38. College of Agriculture, Rajmachi, Tal. Karad District Satara

		415 110. 39. Dr.Ulhas Patil College of Agriculture, Near Dr. Ulhas Patil Medical College, Jalgaon-Bhusawal, 40. Padmabhushan Vasant Dada Patil College of Agriculture, Ambi, Talegaon Dabhade, Tal. Maval District Pune 41. College of Agriculture, Pujya Saneguruji Vidya Prasarak , Shahada District Nandurbar 425 409. 42. Lokmangal College of Agriculture, At. Post. Wadala, Tal. Uttar Solapur District Solapur 413 222 43. College of Agriculture, At Post. Talsande, Tal. Hatkangale, Dist .Kolhapur 416 112. 44. College of Agriculture, At Post. Bahubali, Tal. Hatkangale, Dist .Kolhapur 416 110. 45. Shramshakti College of Agriculture, At. Maldad, Tal. District Ahmednagar-422 608
	Dr Punjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola, Maharashtra.	46. Dr. Rajendra Gode College of Agriculture, Buldana 47. Swatantrya Vir Ganpatrao Ingle College of Agriculture, Jalgaon - Jomod, Buldhana Dist, Maharashtra 48. Vivekanand College of Agriculture, Vivekanand Nagar, Hiwara Ashram, Tal Mehkar, Buldhana Dist 49. Marotrao Wadafale College of Agriculture , Kalamb, Yavatmal D 50. College of Agriculture , Dharwa, Yavatmal Dist 51. Ramakrishna Bajaj College of Agriculture , Wardha 52. Shri Sant Shankar Maharaj College of Agriculture, Pimpalkhuta, DistrictAmravati. 53. Late R.G.Deshmukh College of Agriculture, Tiwsa, DistrictAmravati 54. Shri Samarth College of Agriculture, Deoulgaon Raja, District Buldana 443 204 55. Sau. Vasudhatai Deshmukh College of Agriculture, Talegaon Dashasar Dhamangaon Railway, District Amravati 56. Manoharbhai Patel College of Agriculture, Hiratola, Kalimati, Tal. Goregaon, District Gondia 441 801. 57. Shri Sevakbhau Wakhaye Patil College of Agriculture, Kesalwada Wagh, Tal. Lakhani, DistrictBhandara 58. College of Agriculture, Umarkhed, Tal. Umarkhaed DistrictYavatmal
Rajasthan	Rajasthan Agricultural University, Bikaner	59. Dayanand college of agriculture, Ajmeer. 60. Swamy keshawananda maha vidyalaya,Sangria 61. B.B.D.Govt.PG.College,chimanpura,(shahpura) 62. Govt. College, Sawai Madhopur 63. Parmanad Agriculture Colleges, Gajsinghpur, Sriganganagar 64. Parmanad Agriculture Colleges,Bhodra, Hanumanghad Dist
Tamil Nadu	Tamil Nadu Agricultural University (TNAU), Coimbatore, Tamil Nadu 641003	65. Adhiparasakthi Agricultural College, Kalavai, Vellore District. 66. Vanavarayar Institute of Agriculture, Pollachi - 642 103 67. Thanthai Rover Institute of Agriculture and Rural Development, Perambalur - 621 212 68. College of Agricultural Technology, Kullapuram,Theni-625562 69. Pandit Jawahar lal Nehru College of Agriculture, Bhajancoa, Karakul

New Colleges Being Established During 2010-11

	University	College name
Maharastra	MPKV	1. College of Agriculture, Jalod road, Railway crossing junction, Amalnir

		Jalgaon Dist
		2. Satguru College of Agriculture, Mirjgaon (Toll Nakhyajbal) Curzon, Ahmednagar District
		3. College of Agriculture, Dondaicha Sindhkhed Duhule District
		4. Maeer Mit Agriculture College, Loni Kalbhor Pune District
		5. College of Agriculture, Rajmachi, Korad, Satara District
		6. Padmashri Dr D.Y. Patil college of Agribusiness, Akundi, Pune Dist
		7. College of Agriculture, Chandrapur Road, ITI Pharmacy Campus, Loni, Rahata, Ahmednagar District
		8. Lokmangal College of Agriculture, Badala, North Solapur, Solapr District
		9. Modern College of Agriculture, Kule-Dkhane Mulashi Pune Dist
		10. College of Agriculture, Madadgaon, Bhatandi, Ahmednagar Dist
		11. College of Agriculture, Vidya Nagari, ViVigban road, Baramati, Pune District
		12. Padmashri Dr D Bai Patil College of Agriculture, Talsendh, Hatakpangle, Kholapur District
		13. College of Agriculture, Naryangaon, Juttar, Pune Dist
	PDKV	14. College of Agriculture, Shilo Andheri, Pattur, Akola District
		15. Sau, Vasundatai Desmukh College of Agriculture, Lahari Complex Katori, Balgaon, Amarvati District
		16. Shree Sivaji College of Agriculture, Siavjinagar, Amaravati District
		17. College of Agriculture, Jalgaon, Jamod, Buldana District
	BSKVV	18. Saratchandraji Pawar college of agriculture, Kharbate, Dahibali, Chiplun, Ratnagiri
		19. College of Agriculture, Saralgaon, Murbad, Thane District
		20. Dr Budhajirao Mulik College of Agriculture, Mandki, Palban, Chiplun, Ratnagiri
		21. College of Organic Agriculture,Harwate-Dahivali, Chipln, Ratnagiri Dist
	MAU	22. Vasant Rao college of Agriculture, Nehru Nagar, Kandhar, Naded District
		23. Netaji Subhas Chandra Bose College of Agriculture, Morkhel, Deglur, Nanded District
		24. College of Agriculture, Patri, Parbhani District
		25. College of Agriculture, Khandala, Auranagbad
		26. College of Agriculture, Selu, Parbhani District
		27. Rajiv Gandhi College of Agriculture, Jitur Road, Parbhani District
		28. Kesharbhai Sonaji Rao Kheersagar Ope Kaku College of Agriculture, Nabgan, College Campus, Beed District
		29. Kabins College of Agriculture, M I D C Area Rail Station Marg Tarun Bharat Preschya Bajula Auranagabad District
		30. MGM College of Agriculture, MGM Campus, N-3, Sidco, Auranagabad District
		31. College of Agriculture, Naygaon, Nanded District
		32. College of Agriculture, Loni, Udgir, Latur Dist
		33. S D M V Mandal College of Agiculture, Gebrai Tandai, Paton Road, Auranagabad District
		34. Mathama Gandhi College of Agriculture, Pokharni, Libgaon, Nanded Pune Road, Nanded District
		35. College of Agriculture, Hadda, Basmat, Hingoli District
		36. Aditya College of Agriculture, Beed.
		37. Aditya College of Agriculture, Telgab, Beed.

Source: MCAER web site. Sourced on September 30, 2011

General Universities & Others

Andhra Pradesh	Osmania University, Hyderabad-500007.	1. Loyala Academy (Autonomous) Degree College,Alwal, Secunderabad .
Madhya Pradesh	Mahatma Gandhi Gramodyog Viswavidyalaya,	2. College of Agriculture, Chittrakoot - 485 331, Satna,
Tamil Nadu	Annamalai University, Annamalainagar, 608 002,	3. Faculty of Agriculture, Annamalainagar
	Gandhi Gram Rural Institute, Gandhigram	4. Faculty of Agril. & Animal Husbandry, Gandhigram
Uttar Pradesh	Bundelkhand University, Jhansi	5. Baba Brahmanand Mahavidyalaya, Rath, Hamirpur 6. Zila Parishad Agricultural College, Banda, UP
	Poorvanchal UniversityJaunpur	7. PG College,Ghazipur 8. Udai Pratap College,Varanasi 9. Govt.Degree College,Jakhini,Varanasi 10. SMM Town PG College,Ballia 11. TD College, Jaunpur 12. Baba Raghava Das College, Deoria
	Mahatma jyotiba phule Rohilkhand University Barailley	13. RSM PG College, Dhampur
	Deen dayal upadhyay university (Universityof Gorakhpur), Gorakhpur	14. National post graduate college ,Barhalgani,Gorakhpur. 15. Sri Duragagi PG College, Azamgarh
	ChhatrapatiSahujiMaharaj University, (CSJM), (Kanpur university), Kanpur	16. KA Degree College, Allahabad 17. Janta Mahavidyalaya, Ajitmal 18. Janta College,Bakewar, Etawah dist 19. C.B.Gupta College of Agriculture, Bakshi-Ka-Talab, Lucknow Dist
	Dr.B.R.Ambedkar UNIV, Agra	20. RBS College, Agra 21. Narian College,Shikohabad 22. Ch.Charan singh shivdan college,lglas,Aligarh 23. Sarvodaya Mahavidyalaya, Chaumuhan-mathura-281406
	Chowdary charan singh university (Meerut Univ). Meerut	24. RMP PG Col.,Narsan,Haridwar 25. A.S.College, Lakhaoti,Bulandshahar 26. J.V.College, Baraut 27. R.K.College,Shamili 28. Kissan PG College,Simbhaoli 29. Gochar Mahavidyalaya,Rampur 30. K.V.PG College,Machhra 31. Ch.Chhotu Ram PG college,Muzaffarnagar 32. Inst of Advanced Studies
West Bengal	Calcutta University, Calcutta	33. College of Agriculture, Calcutta

Annexure-5.2

Students Admitted and Passed in Agriculture Courses (Crop Science) during 2009-10

	Diploma		UG		PG		PhD	
University	**Admit**	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**
AAU, ALLAHABAD	1	0	120	137	287	188	29	14
AAU, ANAND	0	94	67	67	117	55	14	17
AAU,JORHAT			184	160	154	19	40	4
AMU, ALIGARAH					18	17	10	2
ANGRAU,HYDERABAD	465	318	623	428	162	103	43	39
BAU, RANCHI			50	20	21		11	
BCKV,MOHANPUR			101	96	142	80	66	5
BHU, VARNASI			128	84	94	66	48	17
Bihar AU, Bhagalpur								
BSKV, DAPOLI			417	353	57	28	6	0
CAU, IMPHAL			80	0	48	0		
CBGKMV, Lucknow			170	100				
CCSHAU, HARYANA			181	74	63	35	12	3
CSKHPKV, PALAMPUR			72	49	61	47	19	7
CSUAST, KANPUR			112	138	90	49	22	19
GBPUAT, PANTHNAGAR			160	146	159	106	118	119
IARI, New Delhi					74	51	86	51
IGKV, RAIPUR			280	150	93	32	7	8
JAU,JUNAGADH	25	0	90	73	63	54	2	17
JNKV, JABALPUR			279	212	165	115	7	0
KAU, TRISSUR			147	185	34	25	9	3
MAU, PARABHANI	3658	2661	419	659	323	184	23	8
MPKV, RAHURI*			1276	1136	276	258	84	29
MPUAT, UDAIPUR			105	75	59	33	13	2
NAU, NAVSARI			77	53	80	71	22	13
NDUAT, Faziabad			100					
OUAT, BHUBANESWAR			100	97	124	60	7	7
PAU, LUDHIANA			110	90	113	63	38	21
PDKV, AKOLA*			1166	783	394	204	51	4
PSB VB, Sriniketan			60					
RAU, PUSA			150	100	101	80	29	10
RSKVV, GWALIOR			240	167	160	147	6	
SKDAU,DANTIWADA	106	76	80	59	68	46	14	9
SKRAU, BIKANIR			435	407	102	86	28	14
SKUAST, JAMMU			53	12	17	13	7	7
SKUAST, Kashmir			57	23	16	12	34	10
SVPUAT, MEERUT			75		46		18	
TNAU, COIMBATORE			363	448	231	147	71	33
UAS, DHARWAD	40	33	222	277	114	96	43	24
UAS,BANGLORE	53	53	433	287	156	179	61	62
UAS,RAICHUR			127	77	60	29		
UBKVV, COOCHBIHAR			50	0	14	16	27	4
YSPUHF, SOLAN					17	15	0	1
Colleges Affiliated to								
MAU, Parbhani			900	494				
SKRAU, BIKANIR			300	292				

TNAU, COIMBATORE			270	128				
Sub Total	4348	3235	10429	8136	4373	2809	1125	583

***** Include data of affiliated colleges

Others

Amar Singh College, Ch Charan Singh University, Lakahoti			185	170				
Annamalai University, Annamalainagar					53	0		
Baba Raghva Das PG College,Deoria, Deen Dayal Upadhyay University			120	110	58	58		
Calcutta University, Calcutta					60	0		
Ch Charan Singh University			120	109	74	54		
Ch Chhotu Ram (PG) College, Ch Charan Singh University, Muzaffernagar			235	151	26	23		
Chandra Bhanu Gupt Krishi Mahavidyalaya, Chhatrapati Sahuji Maharaj University, Lucknow			120	118				
Gochar Mahavidyalaya, Ch Charan Singh University, Rampur			118	110				
Govt Degree college, Veer Bahadur Singh Poorvanchal University, Varanasi			60	59				
Janata Degree College,Bakewar, Etawah, Chhatrapati Sahuji Maharaj University			120	100	15	15		
Janta Vedic College, Ch Charan Singh University, Baraut			156	135				
Kulbhaskar Ashram PG College,Allahabad, Chhatrapati Sahuji Maharaj University			78	61	44	24		
National PG College,Gorakhpur, Deen Dayal Upadhyay University			120	119	30	29		
Raja Balwant Singh College,Bichpuri, Agra, Dr B R Ambedkar University					54	50		
Raja Mahendra Pratap(PG) College, Gurukul Narsan, Haridwar, Hemwati Nandan Bahuguna Garhwal University					30	22		
Ranjit Singh Memorial PG College,Bijnor, Mahatma Jyotiba Phule Rohilkhand University			177	170	30	29		
Rashtriya Kisan P G Degree College, Ch Charan Singh University, Shamili			155	130	53	49		
SASARD, MEZDIPHEMA			600	400	0	0		
Shri Durga Ji PG College, Deen Dayal Upadhyay University			264	240	96	88		
Shri Ganesh Rai PG College,Jaunpur, Veer Bahadur Singh Poorvanchal			188	180	30	30		

University								
Shri Murali Monohar Town PG college,Ballia, Veer Bahadur Singh Poorvanchal University			240	168	110	106		
Tilak Dhari PG College,Jaunpur, Veer Bahadur Singh Poorvanchal University			220	210	90	85		
Udai Pratap College,Varanasi, Veer Bahadur Singh Poorvanchal University			100	96	45	43		
Other 11 pvt colleges			1100	880				
Sub-total others			4476	3716	898	705		

All Colleges

	Diploma		UG		PG		PhD	
	Admit	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**
Grand Total	**4348**	**3235**	**14905**	**11852**	**5271**	**3514**	**1125**	**583**

Annexure-5.3

Posts of Agricultural Human Resources in Some States

State	No. of districts	Posts for agricultural graduates
Andhra Pradesh	23	7159
Uttar Pradesh	70	888
Rajasthan	32	5336
Maharashtra	35	11000
Goa	2	21
Himachal Pradesh	12	880
Tamilnadu	31	2880
Bihar	38	1,627
Kerala	14	4,776
Karnataka	28	8,500
Madhya Pradesh	50	9,388
Jammu & Kashmir	12	500
Punjab	20	850
Andaman &Nicobar	3	50
Lakshadweep	1	10
Total	371	53015
Estimate for other states/Union Territories*	251	35,900
Total of all State Governments		88,915
Central Government (Deptt. Of Agriculture and its offices)		500
Grand total		89,408

Source: Official web-sites of the respective State governments and data collected directly from the States. Numbers are approximate and estimated in some cases on the basis of available data from the websites and also the data collected through the Establishment Survey.

* Estimates for the remaining 251 districts have been made pro rata.

Annexure-5.4

Agricultural Human Resources Stock Requirement Projections for State Governments and Central Promotional Organizations

Year	Diploma	UG	PG	PhD
2009-10	27600	56160	13200	8640
2010-11	27968	56909	13376	8755
2011-12	28336	57658	13552	8870
2012-13	28704	58406	13728	8986
2013-14	29072	59155	13904	9101
2014-15	29440	59904	14080	9216
2015-16	29808	60653	14256	9331
2016-17	30176	61402	14432	9446
2017-18	30544	62150	14608	9562
2018-19	30912	62899	14784	9677
2019-20	31280	63648	14960	9792

Annexure-5.5

Agricultural Human Resources Stock Requirement Projections for Extension Work

Year	Diploma	UG	PG	PhD
2009-10	4580	22400	6008	4013
2010-11	4649	23108	6116	4053
2011-12	4715	23814	6223	4093
2012-13	4772	24509	6326	4131
2013-14	4830	25205	6429	4170
2014-15	4888	25903	6533	4210
2015-16	4946	26603	6637	4249
2016-17	5004	27304	6742	4290
2017-18	5063	28007	6847	4330
2018-19	5122	28712	6953	4371
2019-20	5182	29419	7059	4413

Annexure-5.6

a. Trends in Staff Strength in ICAR Institutions

Year	Scientific		Technical		Administrative		Others		All	
	S	F	S	F	S	F	S	F	S	F
2001	6965	5054	9407	8223	5783	5050	12540	11967	34695	30294
2002	6100	4589	8897	7702	5626	5102	12453	11177	33076	28570
2003	6100	4796	8897	7759	5626	5161	12453	11181	33076	28897
2004	6100	4796	8897	7759	5626	5161	12453	11181	33076	28897
2005	6428	4458	7765	7100	5198	4787	10708	9724	30099	26069
2006	6428	4609	7952	7355	5103	4705	10145	9174	29628	25843
2007	6428	4184	7893	7119	4814	4355	9980	8964	29115	24622
2008	6428	4184	7893	7119	4814	4355	9980	8964	29115	24622
2009	6428	4165	8460	6478	5025	4440	10346	8441	30259	23524
2010	6428	4470	9407	8223	5783	5050				

S= Sanctioned F=Filled

Source: Department of Agricultural Research and Education, Annual Reports for the respective years

b. ICAR's scientists in crop science division as on March 2010

S. No.	Name of the Institute	Overall Scientists in position		
		Sanctioned	In position	% Filled
1.	IARI, New Delhi	594	380	63.97
2.	VPKAS, Almora	60	33	55.00
3.	NBPGR, New Delhi	159	108	67.92
4.	DWR, Karnal	56	44	78.57
5.	NCIPM	24	19	79.16
6.	CICR	80	61	76.25
7.	DRR	71	53	74.64
8.	CRRI, Cuttack	119	85	71.42
9.	DSR, Mau	30	16	53.33
10.	DSR, Hyderabad	48	38	79.16
11.	CRIJAFT	74	43	58.10
12.	DMR, New Delhi	34	21	61.76
13.	SBI, Coimbatore	79	56	70.88
14.	IGFRI, Jhansi	144	78	54.16
15.	IISR, Lucknow	83	61	73.49
16.	IIPR, Kanpur	86	53	61.62
17.	DOR, Hyd.	42	37	88.09
18.	NBAII, Bangalore	30	21	70.00
19.	CTRI, Rajahmundry	70	37	52.85
20.	NBAIM, Mau	24	08	33.33
21.	NRCG, Junagadh	39	19	48.71
22.	NRCPB, New Delhi	33	20	60.60
23.	DRM, Bharatpur	34	26	76.47
24.	NRC Soyabean, Indore	35	23	65.71
	TOTAL	**2055**	**1340**	**65.20**

Annexure-5.7

Agricultural Human Resources Stock Requirement Projections for Research

Year	UG	PG	PhD
2009-10	85	425	1190
2010-11	88	438	1225
2011-12	90	450	1260
2012-13	93	463	1295
2013-14	95	475	1330
2014-15	98	488	1365
2015-16	100	500	1400
2016-17	103	513	1435
2017-18	105	525	1470
2018-19	108	538	1505
2019-20	110	550	1540

Annexure-5.8

SAU's Scientists and Faculty in Crop Science Education as on March 2010

Sl No	University	Sanctioned	In position	Vacant
1	UAS,Banglore	553	365	188
2	AAU,Anand	361	283	78
3	JAU,Junagadh	350	257	93
4	UAS,Raichur	323	146	177
5	SKDAU,Dantiwada	282	251	31
6	ANGRAU,HYDERABAD	393	281	112
7	BCKV,MOHANPUR	230	197	33
8	UBKV,COOCH BEHAR,WB	65	25	40
9	TNAU,COIAMBATORE	1032	994	38
10	UAS, Dharwad	295	247	48
11	UHS, Bagalkot	114	52	62
12	YSPUHF,SOLAN	7	4	3
13	BSKKV,Dapoli	193	170	23
14	RSKVV,GWALIOR,UP	207	71	136
15	CSUAST,Kanpur	106	73	33
16	OUAT,bhubaneshwar	101	87	14
17	KAU,KERALA	318	172	146
18	JNKVV,JABALPUR	190	79	111
19	MPUAT,UDAIPUR	80	46	34
20	UPPDDU,MATHURA	13	7	6
21	UAS,BANGLORE	607	194	413
22	JAU,JUNAGADH	327	88	239
23	MAFSU,NAGPUR	2	0	2
24	BAU,RANCHI	141	28	113
25	SKDAU,DANTIWADA	283	44	239
26	WBAFS,WB	3	0	3
27	AAU,JORHAT	768	413	355
28	SKRAU,BIKANER	610	331	279
29	PDKV,AKOLA	350	146	204
30	CCSHAU,HISSAR,HARYANA	360	155	205
31	IGKVV,RAIPUR	240	155	85
32	RAU,PUSA	291	170	121
33	NAU,NAVSARI	72	9	63
34	CBGKMV, Luchnow	14	0	14
Sub-total for available unvi. (34)		9281	5540	3741
No of total unvi (40)				
Estimate for all universities		10919	6518	4401

Annexure-5.9

Private Sector Seed Industry in India

Year	Indian Private	Multinationals	All
1990-91	107	23	130
1995-96	142	44	186
2000-01	203	68	271
2005-06	253	90	343
2006-07	267	93	360
2009-10	NA	NA	450

Source: wwwtradeindia.com; http:/seednet.in. *Data for 2009-10 from Seed Association*

Annexure-5.10

Production/Distribution of Seeds

Year	Production of Breeder Seed (thousand quintals)	Production of Foundation Seed (lakh quintals)	Distribution of Certified/quality seed (lakh quintals)
2000-01	42.69	5.91	86.27
2001-02	45.54	5.44	91.80
2002-03	48.42	6.14	98.03
2003-04	61.82	6.50	108.59
2004-05	66.46	6.90	120.26
2005-06	68.64	7.40	126.75
2006-07	73.83	7.96	155.01
2007-08	91.96	8.22	179.05
2008-09	94.41	9.69	215.81
2009-10	105.00	10.50	240.00
Annual Growth Rate (%)	10.8	7.1	12.4

Source: Directorate of Economics and Statistics, Ministry of Agriculture and /Cooperation, Agricultural Statistics at a Glance, 2010

Annexure-5.11

Agricultural Human Resources Stock Requirement Projections for Seeds (Low Growth)

Year	Diploma	UG	PG	PhD
2009-10	327	3972	1323	515
2010-11	343	4171	1389	541
2011-12	360	4379	1458	568
2012-13	378	4598	1531	596
2013-14	397	4828	1608	626
2014-15	417	5070	1688	658
2015-16	438	5323	1772	690
2016-17	460	5589	1861	725
2017-18	483	5869	1954	761
2018-19	507	6162	2052	799
2019-20	532	6470	2154	839

Agricultural Human Resources Stock Requirement Projections for Seeds (High Growth)

Year	Diploma	UG	PG	PhD
2009-10	327	3972	1323	515
2010-11	359	4369	1455	567
2011-12	395	4806	1600	623
2012-13	435	5287	1760	686
2013-14	478	5816	1936	754
2014-15	526	6397	2130	830
2015-16	579	7037	2343	913
2016-17	636	7740	2577	1004
2017-18	700	8515	2835	1104
2018-19	770	9366	3118	1215
2019-20	847	10303	3430	1336

Note: LOW GROWTH means growth of 5% per annum
HIGH means growth of 10% per annum

Annexure-5.12

Consumption, Production and Imports of Fertilizers: 2000-01 to 2008-09 (in lakh tonnes)

Year	Production	Imports	Consumption	Imports as % of consumption
2000-01	147.52	20.90	197.02	10.6
2001-02	146.32	23.99	173.60	13.8
2002-03	144.68	17.57	160.94	10.9
2003-04	142.65	20.18	167.98	12.0
2004-05	154.05	27.52	183.98	15.0
2005-06	155.75	52.54	203.40	25.8
2006-07	160.95	60.80	216.52	28.1
2007-08	147.07	77.21	225.70	34.2
2008-09	143.34	101.51	249.09	40.8
2009-10	163.20	81.23	132.25[2]	

[1.] Estimated [2.] Relates to Kharif season only Source: Economic Surveys 2007-08, 2008-09 and 2009-10

Annexure-5.13

Agricultural Human Resources Stock Requirement Projections for Fertilizers (Low Growth)

Year	Diploma	UG	PG	PhD
2009-10	508	4558	2160	157
2010-11	513	4604	2182	158
2011-12	518	4650	2204	160
2012-13	523	4696	2226	161
2013-14	528	4743	2248	163
2014-15	534	4791	2270	165
2015-16	539	4838	2293	166
2016-17	544	4887	2316	168
2017-18	550	4936	2339	170
2018-19	555	4985	2363	171
2019-20	561	5035	2386	173

Agricultural Human Resources Stock Requirement Projections for Fertilizers (High Growth)

Year	Diploma	UG	PG	PhD
2009-10	508	4558	2160	157
2010-11	518	4649	2203	160
2011-12	528	4742	2247	163
2012-13	539	4837	2292	166
2013-14	549	4934	2338	170
2014-15	560	5032	2385	173
2015-16	572	5133	2433	176
2016-17	583	5236	2481	180
2017-18	595	5340	2531	183
2018-19	607	5447	2582	187
2019-20	619	5556	2633	191

Annexure-5.14

Agricultural Human Resources Stock Requirement Projections for Pesticides (Low Gowth)

Year	Diploma	UG	PG	PhD
2009-10	217	1570	315	58
2010-11	219	1586	318	58
2011-12	221	1602	321	59
2012-13	224	1618	324	60
2013-14	226	1634	327	60
2014-15	228	1650	331	61
2015-16	230	1667	334	61
2016-17	233	1683	337	62
2017-18	235	1700	341	63
2018-19	237	1717	344	63
2019-20	240	1734	348	64

Agricultural Human Resources Stock Requirement Projections for Pesticides (High Growth)

Year	Diploma	UG	PG	PhD
2009-10	217	1570	315	58
2010-11	221	1601	321	59
2011-12	226	1633	327	60
2012-13	230	1666	334	61
2013-14	235	1699	341	63
2014-15	240	1733	347	64
2015-16	244	1768	354	65
2016-17	249	1803	362	66
2017-18	254	1839	369	68
2018-19	259	1876	376	69
2019-20	265	1914	384	71

Annexure-5.15

Agricultural Human Resources Stock Requirement Projections for Financial Institutions (Low Growth)

Year	Diploma	UG	PG	PhD
2009-10	2454	27429	9799	700
2010-11	2491	27840	9946	710
2011-12	2528	28258	10095	721
2012-13	2566	28682	10247	732
2013-14	2605	29112	10401	743
2014-15	2644	29549	10557	754
2015-16	2684	29992	10715	765
2016-17	2724	30442	10876	777
2017-18	2765	30899	11039	788
2018-19	2806	31362	11204	800
2019-20	2848	31833	11372	812

Agricultural Human Resources Stock Requirement Projections for Financial Institutions (High Growth)

Year	Diploma	UG	PG	PhD
2009-10	2454	27429	9799	700
2010-11	2600	29060	10382	742
2011-12	2696	30136	10766	769
2012-13	2796	31251	11165	797
2013-14	2900	32407	11578	827
2014-15	3007	33606	12006	858
2015-16	3118	34849	12450	889
2016-17	3233	36139	12911	922
2017-18	3353	37476	13389	956
2018-19	3477	38863	13884	992
2019-20	3606	40301	14398	1028

Annexure -5.16

Agricultural Human Resources Stock Requirement Projections for Insurance

Year	UG	PG
2009-10	1417	708
2010-11	1425	713
2011-12	1433	717
2012-13	1442	721
2013-14	1450	725
2014-15	1458	729
2015-16	1467	733
2016-17	1475	738
2017-18	1483	742
2018-19	1492	746
2019-20	1500	750

Annexure-5.17

Agricultural Human Resources Stock Requirement Projections for Agro-processing (Low Growth)

Year	Diploma	UG	PG	PhD
2009-10	41430	72324	18356	1836
2010-11	41844	73047	18540	1854
2011-12	42263	73778	18725	1873
2012-13	42686	74515	18913	1891
2013-14	43112	75260	19102	1910
2014-15	43544	76013	19293	1929
2015-16	43979	76773	19486	1949
2016-17	44419	77541	19680	1968
2017-18	44863	78316	19877	1988
2018-19	45312	79100	20076	2008
2019-20	45765	79891	20277	2028

Agricultural Human Resources Stock Requirement Projections for Agro-processing (High Growth)

Year	Diploma	UG	PG	PhD
2009-10	41430	72324	18356	1836
2010-11	42259	73770	18723	1872
2011-12	43104	75246	19098	1910
2012-13	43966	76751	19480	1948
2013-14	44845	78286	19869	1987
2014-15	45742	79851	20267	2027
2015-16	46657	81448	20672	2067
2016-17	47590	83077	21086	2109
2017-18	48542	84739	21507	2151
2018-19	49513	86434	21937	2194
2019-20	50503	88162	22376	2238

Annexure-5.18

Agricultural Human Resources Stock Requirement Projections for Organized Retailing

Year	Diploma	UG	PG.
2009-10	2000	2000	1000
2010-11	3000	2500	1500
2011-12	4000	3000	2000
2012-13	5000	3500	2500
2013-14	6000	4000	3000
2014-15	7000	4500	3500
2015-16	8000	5000	4000
2016-17	9000	5500	4500
2017-18	10000	6000	5000
2018-19	11000	6500	5500
2019-20	12000	7000	6000

Annexure-5.19

a) Overall Projections of Requirements Stocks of Agricultural Human Resources (Low Growth)

Year	Diploma	UG	PG	PhD	All UG & above
2009-10	87028	211107	59424	22019	292549
2010-11	89130	214805	60776	22322	297903
2011-12	91236	218527	62136	22628	303291
2012-13	93338	222264	63499	22935	308698
2013-14	95447	226031	64872	23244	314147
2014-15	97563	229828	66255	23556	319639
2015-16	99685	233657	67648	23871	325175
2016-17	101815	237518	69051	24189	330757
2017-18	103952	241412	70465	24510	336386
2018-19	106096	245340	71889	24834	342064
2019-20	108248	249304	73325	25162	347791

c. Overall Projections of Requirements Stocks of Agricultural Human resources (High Growth)

Year	Diploma	UG	PG	PhD	All UG &
2009-10	87028	211107	59424	22019	292549
2010-11	89731	217228	61570	22459	301257
2011-12	92400	222814	63521	22892	309227
2012-13	95086	228515	65509	23334	317357
2013-14	97800	234351	67541	23788	325680
2014-15	100543	240331	69620	24254	334206
2015-16	103316	246464	71750	24733	342947
2016-17	106120	252757	73932	25227	351916
2017-18	108956	259221	76170	25736	361127
2018-19	111826	265866	78467	26262	370596
2019-20	114731	272704	80828	26806	380338

c) Overall Projections of Requirements Stocks of Agricultural Human Resources (Average Growth)

Year	Diploma	UG	PG	PhD	All UG &
2009-10	87028	211107	59424	22019	292549
2010-11	89431	216016	61173	22391	299580
2011-12	91818	220671	62828	22760	306259
2012-13	94212	225390	64504	23134	313028
2013-14	96624	230191	66207	23516	319913
2014-15	99053	235080	67938	23905	326922
2015-16	101501	240060	69699	24302	334061
2016-17	103968	245137	71491	24708	341337
2017-18	106454	250316	73317	25123	348757
2018-19	108961	255603	75178	25548	356330
2019-20	111489	261004	77077	25984	364064

Annexure-5.20

a) Projected Outturns Required in Crop Sciences (Low Growth)

Year	Diploma	UG	PG	PhD	All UG & above
2010-11	4713	14281	4132	964	19377
2011-12	4780	14479	4192	975	19647
2012-13	4839	14668	4249	985	19903
2013-14	4909	14875	4312	997	20184
2014-15	4979	15083	4376	1009	20468
2015-16	5050	15292	4440	1022	20754
2016-17	5120	15503	4505	1034	21043
2017-18	5191	15717	4569	1047	21333
2018-19	5263	15850	4633	1060	21542
2019-20	5334	16050	4698	1073	21820

b) Projected Outturns Required in Crop Sciences (High Growth)

Year	Diploma	UG	PG	PhD	All UG & above
2010-11	5282	16988	4872	1086	22945
2011-12	5385	17404	4995	1108	23507
2012-13	5482	17826	5118	1130	24073
2013-14	5592	18278	5251	1155	24684
2014-15	5703	18748	5389	1181	25319
2015-16	5815	19230	5534	1209	25972
2016-17	5930	19730	5684	1237	26651
2017-18	6047	20251	5833	1268	27351
2018-19	6166	20750	5987	1299	28036
2019-20	6288	21269	6147	1333	28749

c) Projected Outturns Required in Crop Sciences (Average Growth)

Year	Diploma	UG	PG	PhD	All UG & above
2010-11	4997	15634	4502	1025	21161
2011-12	5083	15942	4594	1042	21577
2012-13	5161	16247	4683	1058	21988
2013-14	5250	16576	4781	1076	22434
2014-15	5341	16916	4882	1095	22894
2015-16	5432	17261	4987	1115	23363
2016-17	5525	17617	5095	1136	23847
2017-18	5619	17984	5201	1157	24342
2018-19	5715	18300	5310	1179	24789
2019-20	5811	18659	5422	1203	25284

Annexures for Chapter-6

Annexure-6.1

List of Horticultural Colleges in India

Horticultural Colleges in SAUS

State	University	College/faculty
Andhra Pradesh	Andhra Pradesh Horicultural university, (APHU) Venkatrammanagudem, West godavari, 534101	1. College of Horticulture, Anantharajupet, Kadapa District 2. College of Horticulture, Mojerla, Mahaboobnagar District 3. College of Horticulture, Rajendranagar, Hyderabad Distrcit 4. College of Horticulture, Venkataramannagudem, West Godavari District.
Bihar	Rajendra Agricultural University, Pusa Samastipura,848125	5. College of Horticulture, Noorsarai, (Nalanda)
Delhi	IARI, New Delhi	6. PG School
Gujarat	Navasari Agricultural University (NAU), Navsari 396450	7. ASPEE College of Horticulture and Forestry , Navsari
	Sardar Krushinagar Dantiwada Agricultural University (SDAU), Sardar Krushinagar,	8. Faculty of Horticulture,Dantiwada
Himachal pradesh	Dr. Yashwant Singh Parma University of Horticulture & Forestry (YSPUHF) Solan, Himachal Pradesh 173230	9. College of Horticulture , Via Ochighat, Nauni, Solan
Karnataka	University of Horticulture Sciences, (UHS), Bagalkot	10.KRC College of Horticulture Arabhavi, Belgaum 11.College of Horticulture, Mudigere, Chikkamagalur 12.College of Horticulture, Bagalkot 13.College of Horticulture, Bidar 14.College of Horticulture, Kolar 15.College of Horticulture, Sirsi 16.College of Horticulture, Koppal 17.College of Horticulture, Hiriyur (Chitradurga) 18.College of Horticulture, Mysore 19.Centre for Post Graduate studies, Bangalore
Kashmir	Sher-E-Kashmir University Agricultural Sciences and Technology,Sri nagar,Kashmir	20.Faculty of Agriculture, Wadura Sopore
Kerala	Kerala Agricultural University (KAU)	21. College of Horticulture, P. O. Vellanikkara, Thrissur

Madhya pradesh	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya**,Gwalior**	22.College of Horticulture, Mandsaur
Maha-rashtra	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (BSKKV) Dapoli, 415712	23.College of Horticulture (KKV), Dapoli, Dist Rathnagiri.
	Marathwada Agricultural University, (MAU), Parbhani 431402	24.College of Horticulture (MAU), Krishi Nagar, Parbhani
	Mahatma Phule Krishi Vidyapeeth, (MPKV), Rahuri 413722, Ahmednagar	25.College of Horticulture (MPKV), Pune-, Maharashtra
	Dr Punjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola, Maharashtra 444104	26.College of Horticulture (PDKV), Akola –Maharashtra
Mizoram	Central Agricultural University, Imphal	27.College of Horticulture and Forestry (CAU), Pasighat ,
Orissa	Orissa University of Agriculture & Technology, Bhubaneswar	28.College of horticulture, Chiplima
Rajasthan	Maharana Pratap Agriculture and Technology University, Udaipur	29.College of Horticulture and Forestry, Udaipur
Tamil Nadu	Tamil Nadu Agricultural University (TNAU), Coimbatore, Tamil Nadu 641003	30.Horticultural College and Research Institute, Theni Dist, Priyakulam East. 31.Horticultural College and Research Institute, Coimbatore.
Uttar Pradesh	Chandra Shekhar Azad University of Agriculture & Technology (CSAUT) Kanpur, Uttar Pradesh 208002	31.Faculty of Horticulture, Kanpur, Uttar Pradesh
	Narendra Deva University o Agriculture & Technology ,Faizabad,U.P	32.College of horticulture,Faizabad
Uttarakand	G.B.pant University of Agriculture and technology,Pant Nagar, Uttarakand	33.V.C.S.G.College of Horticulture,Bharsar
West Bengal	Bidhan Chandra Krishi Vishva Vidyalaya (BCKV Nadia,West Bengal 741246	34.Faculty of Horticulture, Mohanpur, Nadia
	Uttar Banga Krishi Vishwavidyalaya (UBKV Cooch Bihar– 736165,west bengal	35.College of Horticulture , Pundibari, Cooch Behar

Horticultural Colleges Affiliated to Agricultural Universities

Maharashtra	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (BSKKV) Dapoli, 415712 Mahatma Phule Krishi Vidyapeeth, (MPKV), Rahuri	1. Sharadchandrajee Pawar College of Horticulture (Private- afiliated to BSKKV), Tal. Chiplun, District Ratnagiri 2. Shrimant Shivajiraje College of Horticulture (Private – afiliated to MPKV), Phaltan, Satara Dist – 415523
	Dr Punjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola, Maharashtra 444104	3. Shivaji College of Horticulture (Private college-afiliated to PDKV), Amravati. 4. Swatantrya Veer G.I. College of Horticulture, (Private college-afiliated to PDKV) Jalgaon Jamod, District Buldhana 443 402.
Chhattis-garh	Indira Gandhi Krishi Viswavidyalay, Raipur 492012	5. Gayatri college of horticulture,Dhamtari 6. K.L.college of horticulture, Dhamtari. 7. Rani Durgwati college of horticulture,pendra, Bilaspur 8. Danteshwari college of horticulture, RAIPUR

* New colleges being established during 2010-11. Source: MCAER web site on Sept 30, 2011

Horticultural Colleges in General Universities

West Bengal	Calcutta University, Calcutta	1. Rev. William Carey Institute of Horticulture, Calcutta, University of Calcutta
Tamil Nadu	Annamalai University	2. Faculty of Horticulture, Chidambaram, Tamil Nadu
Uttarakhand	HNB Garhwal University, Srinagar	3. School of horticulture, Srinagar, Pauri District, Uttarakhand

Annexure-6.2

Students Admitted and Passed in Horticultural Colleges during 2009-10

University	Diploma		UG		PG		PhD	
	Adm	Pass	Adm	Pass	Adm	Pass	Adm	Pass
AAU, Allahabad			0	0	60	27	2	0
AAU, Anand			0	0	15	12	0	0
APHU, Vgudem	133	0	261	100	47	20	8	NA
BCKV,Mohanpur			30	20	27	15	17	NA
BHU, Varnasi			0	0	18	12	5	1
BSKV, Dapoli			55	51	7	7	0	0
CAU, Imphal			38	0	27	0	0	0
CCSHAU, Haryana			0	0	15	10	3	2
CSKHPKV, Palampur			0	0	2	0	2	2
CSUAST, Kanpur			NA	NA	19	12	2	1
GBPUAT, Panthnagar			32	12	16	12	10	4
IARI, New Delhi			0	0	8	6	11	6
IGKV, Raipur			103	43	13	5	2	4
JAU, Junagadh	25	0	0	0	20	16	4	0
JNKV, Jabalpur			0	0	74	71	0	0
KAU, Trissur			NA	NA	21	8	2	5
MAU, Parabhani			33	31	0	0	0	0
MPKV, Rahuri			328	257	0	0	0	0
MPUAT, Udaipur	0	0	37	24	4	4	8	8
NAU, Navsari			32	29	20	24	12	2
OUAT, Bhubaneswar			24	NA	0	0	0	0
PDKV, Akola			108	73	0	0	0	0
RAU, Pusa			25	20	33	7	0	0
RSKVV, Gwalior			50	54	23	20	4	NA
SKDAU, Dantiwada	7	4	36	NA	0	0	0	0
SKRAU, Bikanir			0	0	13	11	3	1
SKUAST, Jammu			0	0	18	10	1	1
SKUAST, Kashmir			28	NA	0	0	0	0
TNAU, Coimbatore			79	79	36	24	10	7
UAS, Dharwad			0	45	0	2	4	1
UAS, Bengaluru	7	6	0	44	30	24	0	0
UBKVV, Coochbihar			15	0	15	NA	0	0
UHS, Bagalkot			220	63	36	18	0	0
YSPUHF, Solan			68	56	36	32	18	10
NDUAT, faizabad			NA	NA	0	0	0	0
Others								
Calcutta University, Calcutta	NA	NA	0	NA	10	0	0	0

Annamalai University, Annamalainagar	NA	NA	6	NA	0	0	0	0
HNB Garhwal University, Srinagar	NA	NA	25	NA	10	NA	8	NA
Grand Total	**172**	**10**	**1602**	**1001**	**653**	**409**	**128**	**55**

Annexure-6.3

Rates of Productivity Change for Different Horticultural Crops

Crop group	Productivity growth rate (% per year)		
	During 2000-01 to 2008-09	**During 2004-05 to 2008-09**	**Assumed growth rate for 2009-10 to 2019-20**
Fruits	0.0	2.9	2.5*
Vegetables	1.5	2.1	2.5
Flowers	(-)1.6	1.5	2.0
Nuts	3.4	3.8	4.0
Aromatic and medicinal crops	NA	(-)1.3	1.0
Plantations	1.0	2.8	3.0
Spices	5.5	5.1	6.0
All horticultural crops	**2.1**	**3.5**	**4.0**

* considering that the rise in productivity has been steep in recent years

Annexure-6.4

Year-wise Projected Employment in Nurseries

Year	Total Emp.(in Lakhs)	All Agri. Trained Personnel	Certificate /training	Diploma	UG	PG	PhD
2009-10	1.35	13312	1809	1688	7560	1580	675
2010-11	1.38	13607	1849	1725	7728	1615	690
2011-12	1.41	13903	1889	1763	7896	1650	705
2012-13	1.44	14199	1930	1800	8064	1685	720
2013-14	1.47	14495	1970	1838	8232	1720	735
2014-15	1.50	14790	2010	1875	8400	1755	750
2015-16	1.53	15086	2050	1913	8568	1790	765
2016-17	1.56	15381	2090	1950	8736	1825	780
2017-18	1.59	15678	2131	1988	8904	1860	795
2018-19	1.62	15973	2171	2025	9072	1895	810
2019-20	1.65	16270	2211	2063	9240	1931	825

Annexure-6.5

Projected Area under Fruits and Vegetables and Skilled Human Resources Requirements

Year	Projected Area (million hectares)		Employment of skilled human resources			
	Fruits	Vegetables	Fruits (25,000 per million hectares)	Vegetables (1,00,000 per million hectares)	Total of fruits and vegetables	Total for horticulture @
2009-10	6.13	8.14	153250	814000	967250	1381786
2010-11	6.16	8.30	154000	830000	984000	1405714
2011-12	6.19	8.46	154750	846000	1000750	1429643
2012-13	6.22	8.62	155500	862000	1017500	1453571
2013-14	6.25	8.79	156250	879000	1035250	1478929
2014-15	6.28	8.96	157000	896000	1053000	1504286
2015-16	6.31	9.14	157750	914000	1071750	1531071
2016-17	6.34	9.32	158500	932000	1090500	1557857
2017-18	6.38	9.50	159500	950000	1109500	1585000
2018-19	6.41	9.68	160250	968000	1128250	1611786
2019-20	6.44	9.87	161000	987000	1148000	1640000

@Fruits and vegetables crops accounted for 65% of all area under horticulture in 2000-01 and 68% in 2008-09. Accordingly, overall skilled human resources requirement for horticulture as a whole has been estimated pro rata.

Annexure-6.6

Projected Skilled Human Resources Requirements for Horticultural Production

Year	All skilled personnel	Certificate/informal trg.	Diploma	UG	PG	PhD
2009-10	1381786	1243607	124373	12437	1244	124
2010-11	1405715	1265144	126527	12653	1265	127
2011-12	1429643	1286679	128681	12868	1287	129
2012-13	1453571	1308214	130834	13083	1308	131
2013-14	1478930	1331037	133117	13312	1331	133
2014-15	1504287	1353858	135399	13540	1354	135
2015-16	1531071	1377964	137810	13781	1378	138
2016-17	1557856	1402070	140221	14022	1402	140
2017-18	1585000	1426500	142664	14266	1427	143
2018-19	1611786	1450607	145075	14508	1451	145
2019-20	1640001	1476001	147615	14761	1476	148

Annexure-6.7

a. Projected Skilled Human Resources Requirements for Horticultural Cold Stores by Level of Education (Low growth scenario)

Year	No. of cold stores	Total employment	Employment of persons with agri. skills	Cert./ Trg	Diploma	UG	PG/ PhD
2009-10	5480	71234	10464	4986	0	5478	0
2010-11	6241	81129	11918	5679	0	6239	0
2011-12	7058	91757	13479	6423	0	7056	0
2012-13	7936	103163	15155	7221	0	7933	0
2013-14	8877	115396	16952	8078	0	8874	0
2014-15	9885	128504	18877	8995	0	9882	0
2015-16	10965	142544	20940	9978	0	10962	0
2016-17	12121	157569	23147	11030	0	12117	0
2017-18	13357	173641	25508	12155	0	13353	0
2018-19	14679	190823	28032	13358	0	14674	0
2019-20	16091	209180	30729	14643	0	16086	0

b. Projected Skilled Human Resources Requirements for Horticultural Cold Stores by Level of Education (High growth scenario)

Year	No. of cold stores	Total employment	Employment of persons with agri. skills	Cert./trg	Diploma	UG	PG/ PhD
2009-10	5480	71240	10465	4987	0	5478	0
2010-11	6385	83005	12193	5810	0	6383	0
2011-12	7304	94958	13949	6647	0	7302	0
2012-13	8307	107989	15864	7559	0	8304	0
2013-14	9399	122182	17948	8553	0	9396	0
2014-15	10587	137625	20217	9634	0	10583	0
2015-16	11878	154416	22684	10809	0	11875	0
2016-17	13281	172655	25363	12086	0	13277	0
2017-18	14804	192453	28271	13472	0	14800	0
2018-19	16456	213926	31426	14975	0	16451	0
2019-20	18246	237202	34845	16604	0	18241	0

Annexure-6.8

Projections of Volumes of Fruits and Vegetables to be Processed

Year	Per cent to be processed	Volume to be processed High Growth scenario		Volume to be processed Low Growth scenario	
		Production	To be Processed	Production	To be Processed
2009-10	10	224164	22416	226740	22674
2010-11	11	234027	25743	239438	26338
2011-12	12	244324	29319	252846	30342
2012-13	13	255074	33160	267005	34711
2013-14	14	266297	37282	281958	39474
2014-15	15	278014	41702	297747	44662
2015-16	16	290247	46440	314421	50307
2016-17	17	303018	51513	332029	56445
2017-18	18	316351	56943	350622	63112
2018-19	19	330270	62751	370257	70349
2019-20	20	344802	68960	390992	78198
CAGR		4.4	11.8	5.6	13.1

Annexure-6.9

Fruit and Vegetable Processing Units in India Approved Under Fruit Product Order 1955

Year	No. of Units	Installed capacity (lakh tonnes/year)	Production (lakh tonnes/year)
1990	3,629	7.08	2.60
1995	4,270	14.02	6.76
1996	4,400	17.60	8.50
1997	4,700	19.10	9.10
1998	5,112	20.80	9.40
1999	5,198	21.00	9.80
2000	5,293	21.10	9.90
2007	6,736	NA	NA

Source: Ministry of Food Processing Industries, cited in Agricultural Research Data Book, 2009, IASRI

Annexure-6.10

Number of Factories in Operation Engaged in Processing and Preserving of a) Fruits and Vegetables and b) Alcoholic Beverages and the Number of Persons Engaged in them

Year	No. of Factories in Operation		Total No. of Persons Engaged		
	Vegetables and fruit	Alcoholic beverages	Vegetables and fruit	Alcoholic beverages	
1998-99	307	381	21,039	45,128	
1999-2000	395	382	26,725	47,540	
2000-01	499	408	27,030	55,332	
2001-02	449	401	24,514	54,561	
2002-03	440	387	29,714	53,933	
2003-04	473	398	29,323	56,587	
2004-05	565	433	40,506	58,349	
2005-06	576	439	42,743	62,773	
CAGR (%)	7.4	1.8	9.3	4.1	
Projections					
			High	Low	
2006-07	619	447	48011	46,718	65,347
2007-08	664	455	54013	51,063	68,026
2008-09	714	463	60764	55,812	70,815
2009-10	766	471	68360	61,002	73,718
2010-11	823	480	76905	66,675	76,741
2011-12	884	489	86518	72,876	79,887
2012-13	949	497	97333	79,654	83,163
2013-14	1020	506	109499	87,062	86,572
2014-15	1095	515	123187	95,158	90,122
2015-16	1176	525	138585	104,008	93,817
2016-17	1263	534	155908	113,681	97,663
2017-18	1357	544	175396	124,253	101,667
2018-19	1457	554	197321	135,809	105,836
2019-20	1565	564	221986	148,439	110,175
CAGR(%)			12.5	9.3	4.1

Source: Estimates from Annual Survey of Industries Reports for the respective years up to 2005-06, and projections based on the annual growth rates (CAGRs) for the period 1998-99 to 2005-06 for subsequent years

Annexure-6.11

Projected Skilled Human Resources Requirements for Horticultural Processing by Level of Education (Low Growth)

Year	Total employ-ment	All Agri-skilled personnel	Cert./ training	Diploma	UG	PG	PhD
2009-10	134721	36557	26120	2064	7671	476	226
2010-11	143416	38434	27262	2235	8170	520	247
2011-12	152763	40389	28458	2386	8707	568	270
2012-13	162816	42461	29710	2550	9285	621	295
2013-14	173634	44656	31021	2727	9906	679	322
2014-15	185280	46983	32395	2917	10576	742	352
2015-16	197825	49451	33834	3123	11298	811	385
2016-17	211344	52072	35343	3345	12076	887	421
2017-18	225920	54854	36925	3585	12915	969	460
2018-19	241644	57812	38585	3845	13820	1059	502
2019-20	258614	60956	40326	4125	14798	1158	549

Projected Skilled Human Resources Requirements for Horticultural Processing by Level of Education (High Growth)

Year	Total employ-ment	All Agri-skilled personnel	Cert./ training	Diploma	UG	PG	PhD
2009-10	142078	37392	26285	2222	8099	533	253
2010-11	153646	39555	27492	2413	8766	600	285
2011-12	166405	41885	28765	2624	9501	675	320
2012-13	180495	44398	30108	2858	10314	759	360
2013-14	196071	47115	31526	3117	11212	854	405
2014-15	213308	50055	33026	3405	12207	961	456
2015-16	232402	53241	34612	3725	13310	1081	513
2016-17	253571	56700	36293	4080	14533	1216	577
2017-18	277064	60460	38076	4475	15891	1368	649
2018-19	303157	64553	39969	4915	17400	1539	730
2019-20	332161	69017	41980	5405	19078	1731	821

Annexure-6.12

Posts of Horticultural Officers and Staff in Some States

State	No. of districts	Horticultural human resources		
		Officers	Staff	Grade IV (Malis, etc)
1. Andhra Pradesh	23	390	400	NA
2. Karnataka	30	1664	856	1953
3. Madhya Pradesh	50	475	1112	54
4. Punjab	20	202	49	553
5. Gujarat	26	196	78	NA
6. Himachal Pradesh	12	408	329	887
7. Orissa	30	106	NA	NA
8. Chhattisgarh	18	197	NA	NA
Total	**209**	**3638**	**2824**	**3447**

Source: Official web-sites of the respective State governments and data collected directly from the States. Numbers are approximate and estimated in some cases on the basis of available data from the websites and also the data collected through the establishment Survey

Annexure-6.13

ICAR's Scientists in Horticulture Division as on March 2010

Sl. No	University	Sanctioned	In position	Vacant (%)
1.	CPRI, Shimla	109	77	70.64
2.	IISR, Calicut	42	36	85.71
3.	CARI, Port Blair	55	33	60.00
4.	CPCRI, Kasargod	84	60	71.42
5.	CISH, Lucknow	46	40	86.95
6.	IIVR, Varanasi	63	40	63.49
7.	CITH, Srinagar	21	16	76.19
8.	CTCRI, Thiruvananthapuram	50	43	86.00
9.	IIHR, Bangalore	149	135	90.60
10.	CIAH, Bikaner	31	23	74.19
11.	DMAP, Anand	25	15	60.00
12.	NRC Cashew, Puttur	18	12	66.66
13.	NRC Citrus, Nagpur	20	17	85.00
14.	NRC Mushroom, Solan	16	08	50.00
15.	NRC Grapes, Pune	17	14	82.35
16.	NRC Oilpalm, Pedavegi	22	16	72.72
17.	NRC Banana, Trichy	15	15	100
18.	NRC Pomegranate	09	08	88.88
19.	NRC Orchid	15	09	60.00
20.	NRC Seed Spices, Ajmer	20	11	55.00
21.	Directorate on Onion and Garlic Research, Pune	15	10	66.66
22.	NRC on Litchi	15	06	40.00
23.	Directorate of Floriculture Research, New Delhi	14	3	21.42
TOTAL		**871**	**647**	**74.2**

Annexure-6.14

SAU's Scientists and Faculty in Horticulture Education as on March 2010

SNo	University	Sanctioned	In position	Vacant
1	UAS, Bengaluru	35	20	15
2	UAS, Raichur	31	10	21
3	BCKV,Mohanpur	55	48	7
4	UBKV,Coochbehar	35	14	21
5	TNAU,Coiambatore	150	130	20
6	UAS, Dharwad	37	21	16
7	APHU,Vrgudem	190	174	16
8	UHS, Bagalkot	109	67	42
9	YSPUHF, Solan	240	155	85
10	BSKKV, Dapoli	5	5	0
11	OUAT, Bhubaneshwar	17	12	5
12	KAU, Trissur	53	40	13
13	MPUAT, Udaipur	14	12	2
14	MPKV, Rahuri	78	17	61
15	CCSHAU, Hissar	117	82	35
16	WBAFS,WB	3	0	3
17	PDKV, Akola	128	57	71
18	IGKVV,Raipur	230	150	80
19	NAU, Navsari	67	35	32
20	RVSKVV,Gwalior	49	25	24
Sub-total for available 20 unviersities		1643	1074	569
Estimate for all 34 unviersities		3204	2094	1110

Annexure-6.15

Overall Projections of Requirements Stocks of Horticultural Personnel

a. High growth

Year	Diploma	UG	PG	PhD	UG & above
2009-10	146320	50005	9325	3254	62583
2010-11	148977	52345	9489	3360	65193
2011-12	151625	54780	9663	3471	67914
2012-13	154294	57394	9849	3587	70829
2013-14	157133	60219	10045	3708	73972
2014-15	159998	63258	10269	3876	77403
2015-16	163040	66544	10508	4053	81104
2016-17	166117	70084	10762	4235	85081
2017-18	169271	73907	11035	4426	89368
2018-19	172434	78032	11328	4627	93987
2019-20	175790	82506	11645	4840	98990

b) Low growth

Year	Diploma	UG	PG	PhD	UG & above
2009-10	146320	50004	9325	3254	62583
2010-11	148940	52061	9472	3352	64885
2011-12	151541	54232	9626	3454	67311
2012-13	154156	56525	9786	3558	69869
2013-14	156929	58963	9953	3665	72581
2014-15	159715	61541	10142	3816	75499
2015-16	162664	64281	10339	3973	78593
2016-17	165630	67179	10544	4132	81855
2017-18	168653	70250	10758	4295	85304
2018-19	171664	73499	10982	4463	88944
2019-20	174840	76957	11219	4637	92813

c) Average growth

Year	Diploma	UG	PG	PhD	UG & above
2009-10	146320	50005	9325	3254	62583
2010-11	148959	52203	9481	3356	65039
2011-12	151583	54506	9645	3462	67613
2012-13	154225	56960	9817	3572	70349
2013-14	157031	59591	9999	3686	73276
2014-15	159857	62399	10205	3846	76451
2015-16	162852	65412	10423	4013	79848
2016-17	165873	68632	10653	4183	83468
2017-18	168962	72079	10897	4361	87336
2018-19	172049	75765	11155	4545	91465
2019-20	175315	79731	11432	4738	95902

Annexure-6.16

a) Projected Outturns Required in Horticulture (High Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	7015	4607	673	204	5484
2011-12	7117	4801	739	212	5752
2012-13	7218	5102	767	220	6089
2013-14	7468	5428	795	229	6452
2014-15	7580	5766	844	280	6890
2015-16	7842	6151	881	292	7324
2016-17	7968	6550	921	304	7774
2017-18	8138	6988	967	319	8274
2018-19	8241	7436	1013	334	8782
2019-20	8529	7950	1063	351	9365

b) Projected Outturns Required in Horticulture (Low Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	7010	4277	641	196	5113
2011-12	7069	4471	699	202	5373
2012-13	7160	4695	720	208	5623
2013-14	7398	4931	739	214	5883
2014-15	7494	5170	775	262	6207
2015-16	7740	5445	798	271	6513
2016-17	7846	5715	824	278	6817
2017-18	7993	6008	858	288	7154
2018-19	8070	6304	888	296	7489
2019-20	8326	6641	922	308	7871

c) Projected Outturns Required in Horticulture (Average Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	7012	4442	657	200	5299
2011-12	7093	4636	719	207	5562
2012-13	7189	4899	744	214	5856
2013-14	7433	5179	767	221	6168
2014-15	7537	5468	810	271	6548
2015-16	7791	5798	839	282	6919
2016-17	7907	6132	872	291	7296
2017-18	8065	6498	913	303	7714
2018-19	8155	6870	951	315	8136
2019-20	8428	7295	993	330	8618

Annexures for Chapter-7

Annexure-7.1

List of Institutions Offering Forestry Courses in India

State	University	College/faculty
Assam	Assam Agricultural University,Jorhat	1. College of agriculture(Dept. of forestry),Jorhat
Arunachal Pradesh	CentralAgricultural University	2. College of Horticulture and Forestry (CAU), Pasighat , Arunachal Pradesh
Delhi	IARI, New Delhi	3. PG School
Gujarat	Navsari Agricultural University, Navsari.	4. ASPEE College of Horticulture and Forestry, Navsari.
Haryana	CCS HAU, Hisar	5. Dept of Forestry
Himachal Pradesh	Dr. Yashwant Singh Parmar University of Horticulture & Forestry (YSPUHF) Solan, Himachal Pradesh, 173230	6. College of Forestry (YSPUHF), Via Ochighat, Nauni, Solan
	CSHPKV, Palampur	7. Department
Jammu & Kashmir	Sher-e- Kashmir University of Agricultural Science & Technology University, Srinagar	8. College of forestry, Srinagar
	SKUAST, Jammu	9. Department
Jharkhand	Birsa Agricultural University, Ranchi	10. Ranchi Forestry College (BAU), Kanke, Ranchi 834006
Karnataka	University of Agricultural Sciences, (UAS-B), Bangalore	11. College of Forestry, Ponnampet, kodagu dist
	University of Agricultural Sciences, (UAS-D), Dharwad	12. College of Forestry, Sirsi
Kerala	Kerala Agricultural University, Thrissur	13. College of Forestry (KAU), P.O. Vellanikkara, Thrissur,
Madhya Pradesh	Jawaharlal Nehru Krisghi Viswavidyalay, Jabalpur	14. College of Agriculture, Jabalpur(for Agro-forestry)
	IGKVV, Raipur	15. Department
Maha-rashtra	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (BSKKV) Dapoli, 415712	16. College of Forestry, Ratnagiri
	Dr Punjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola, Maharashtra 444104.	17. College of Forestry (PDKV), Akola - 444104, Maharashtra
Orissa	Orissa University of Agriculture & Technology, Bhubaneswar	18. College of agriculture (Dept. of forestry)

Punjab	PAU, Ludhiana	19. Forestry Department
Rajasthan	Maharana Pratap University of Agriculture and Technology, Udaipur	20. Department College of Horticulture and Forestry,Udaipur
Tamil Nadu	Tamil Nadu Veterinary and Animal Sciences University, Chennai	21. Foresty College and Research Institute (TNAU), Mettupalayam, Coimbatore - 641301
Uttar Pradesh	Chandra Shekhar Azad University of Agriculture & Technology (CSAUT) Kanpur, Uttar Pradesh 208002	22. Faculty of Agriculture(Dept. of forestry),Kanpur
Uttara-khand	Govind Ballbh Pant University of Agriculture & Technology, Pantnagar	23. College of Forestry & Hill Agriculture (GBPUAT), Ranichauri (Uttarakhand)
Uttar Pradesh	Allahabad Agricultural University,	24. College of Silviculture & Agro Forestry (AAI), Naini, Allahabad
West Bengal	UBKVV, Coochbehar	25. Forestry Department

Forestry Colleges in General Universities & Others

1. Forestry Research Institute, Dehra Dun
2. Osmania University, Hyderabad
3. HN Bahuguna Garhwal University, Srinagar, Uttar Pradesh.
4. Indian Institute of Forest Management, Nehru Nagar, Bhopal
5. Karnatak University, Dharwar
6. Kumaun University, Nainital.
7. Manipur University, Canchipur, Imphal
8. North - Eastern Hill University, Shillong
9. Indian Institute of Remote Sensing, Dehradun
10. Wildlife Institute of India, Dehra Dun (affiliated to Saurashtra Univ, Rajkot)
11. Guru Ghasidas University, Bilaspur

Annexure-7.2

Students Admitted and Passed in Forestry Colleges at Various Levels During 2009-10

Universities	UG		PG		PhD	
	Admit	Pass	Admit	Pass	Admit	Pass
AAU, Allahabad	78	83	10	6	5	1
AAU,Jorhat	33	4	10	11	3	3
BAU, Ranchi	23	10	6	NA	5	NA
BHU, Varnasi	0	0	16	10	0	0
BSKV, Dapoli	30	24	6	2	0	0
CAU, Imphal	26	NA	0	0	0	0
CCSHAU, Hissar	0	0	2	NA	2	NA
CSKHPKV, Palampur	0	0	3	NA	0	0
CSUAST, Kanpur	23	28	0	0	0	0
GBPUAT, Panthnagar	26	22	22	14	0	0
IGKV, Raipur	0	0	7	4	2	1
JNKV, Jabalpur	26	11	8	NA	0	0
KAU, Trissur	22	20	10	3	0	0
MPUAT, Udaipur	13	12	2	NA	2	NA
NAU, Navsari	26	16	6	1	2	0
OUAT, Bhubaneswar	24	17	0	0	0	0
PDKV, Akola	29	24	0	0	0	0
SKUAST, Jammu	0	0	4	3	0	0
SKUAST, Kashmir	15	9	5	2	6	NA
TNAU, Coimbatore	32	23	16	9	4	3
UAS, Dharwad	43	29	18	14	0	0
UAS,Banglore	43	22	6	1	0	0
UBKVV, Coochbihar	0	0	NA	1	0	0
YSPUHF, Solan	50	32	53	45	26	5
Others						
Guru Ghasidas University, Bilaspur, Chattisgarh	0	0	0	0	50	NA
HNB Garhwal University, Srinagar	25	NA	12	NA	0	0
IIFM, Bhopal	0	0	72	69	0	0
FRI, Dehradun	0	0	112	80	60	42
Grand Total	**587**	**386**	**406**	**275**	**167**	**55**

Note: Data is not available for about seven colleges in general universities.
Source: Project data

Annexure-7.3

STATEMENT SHOWING CADRE WISE INFORMATION IN RESPECT OF THE INDIAN FOREST SERVICE AS ON 01.01.2010

S. No	CADRE	Area (000Sq km)		Number of Cadre Posts						Reserves				Direct Recruit Posts	Promotion Posts	Total Strength	Notified On
		Geog. Area	Record Forests	PCCF	Addl. PCCF	CCF	CF	DCF	TOTAL	CDR	SDR	Training	L & G				
1	AGMUT			5	10	20	19	58	112	22	28	3	18	128	55	183	24/03/2009
	Arunachal Pradesh	83.74	51.54	2	4	7	6	19	38								
	A&N Islands	8.25	7.17	2	2	5	3	12	24								
	Mizoram	21.08	15.94	1	2	5	3	8	19								
	Goa	3.70	1.22	0	1	1	2	8	12								
	Chandigarh	0.11	0.03	0	0	0	1	2	3								
	Delhi	1.48	0.09	0	1	1	1	4	7								
	D&D, D&N Haveli	0.49	0.20	0	0	1	1	3	5								
	Lakshyadweep	0.30	0	0	0	0	1	1	2								
	Pondichery	0.48	0	0	0	0	1	1	2								
2	ANDHRA PRADESH	275.07	63.81	2	10	11	23	45	91	18	22	3	15	105	44	149	18/12/2009
3	ASSAM-MEGHALAYA			2	0	5	21	44	72	14	18	2	12	83	35	118	09/11/1995
	Assam	78.44	27.02	1	0	4	17	33	55								
	Meghalaya	22.43	9.50	1	0	1	4	11	17								
4	BIHAR	94.16	6.08	1	2	5	10	18	36	7	9	1	5	41	17	58	15/09/2006
5	CHHATISGARH	135.19	59.29	2	4	12	16	45	79	16	20	3	13	92	39	131	23/01/2006
6	GUJARAT	196.02	18.99	2	6	12	17	36	73	14	18	2	12	84	35	119	07/07/2009
7	HARYANA	44.21	1.55	1	2	6	11	23	43	8	10	1	7	49	20	69	16/05/2006
8	HIMACHAL PRADESH	55.67	37.03	2	4	11	17	29	63	13	16	2	10	74	32	106	16/11/2007
9	JAMMU & KASHMIR	222.24	20.23	2	3	9	16	35	65	13	16	2	10	58	48	106	15/09/2006
10	JHARKHAND	79.71	23.61	2	3	10	32	31	78	16	20	3	13	91	39	130	25/11/2004
11	KARNATAKA	191.79	38.72	2	5	13	25	55	100	20	25	3	16	115	49	164	15/09/2006
12	KERALA	38.86	11.22	2	3	11	15	32	63	12	15	2	10	72	30	102	03/10/2008
13	MADHYA PRADESH	308.25	95.22	3	10	68	34	65	180	36	45	6	30	208	89	297	26/08/2008
14	MAHARASHTRA	307.71	61.94	2	3	12	31	65	113	22	28	4	18	130	55	185	17/04/2002
15	MANIPUR-TRIPURA			2	5	12	15	37	71	14	17	2	11	81	34	115	07/07/2009
	Manipur	22.33	17.42	1	2	6	9	16	34								
	Tripura	10.49	6.29	1	3	6	6	21	37								
16	NAGALAND	16.58	8.63	1	2	4	6	13	26	5	6	1	4	30	12	42	07/07/2009
17	ORISSA	155.71	58.14	2	4	16	20	44	86	17	21	3	14	99	42	141	21/10/2008
18	PUNJAB	50.36	3.06	1	2	6	9	18	36	7	9	1	5	41	17	58	23/11/2006
19	RAJASTHAN	342.24	32.49	2	6	21	16	44	89	17	22	3	14	102	43	145	07/07/2009
20	SIKKIM	7.10	5.77	1	1	2	5	10	19	3	4	1	3	21	9	30	18/12/2009
21	TAMIL NADU	130.06	22.87	2	10	23	16	39	90	18	22	3	14	103	44	147	18/12/2009
22	UTTAR PRADESH	240.93	16.83	2	5	33	26	67	133	26	33	4	21	152	65	217	18/12/2009
23	UTTRAKHAND	53.48	34.66	3	4	14	12	33	66	13	16	2	10	75	32	107	07/07/2009
24	WEST BENGAL	88.75	11.88	2	2	8	21	36	69	13	17	2	11	81	34	115	11/12/2007
	TOTAL	3286.63	768.44	48	106	344	433	922	1853	364	457	59	296	2115	919	3034	

Annexure-7.4

Posts in Forest Departments of States

State	IFS/ SFS	RangeOfficers / Rangers	Dy.Rangers/ Range Assts	Others	Total
Andhra Pradesh	336	426	391	2880	4033
Assam	106	378	228	5969	6681
Tamilnadu	147	562	0	6104	6813
Karnataka	332	630	0	6199	7161
Kerala	175	204	138	3264	3781
Goa	19	31	6	328	384
Madhya Pradesh	588	473	0	9640	10701
Uttar Pradesh	359	710	0	0	1069
Uttarakhand	233	753	0	2056	3042
Bihar	82	116	340	967	1505
Chhattisgarh	250	293	545	3810	4898
Jharkhand	275	383		4145	4803
Meghalaya	54	80	0	691	839
Nagaland	42	52	41	611	746
Manipur	37		0	0	37
Tripura	84	133	0	1497	1714
Sikkim	108	0	0	0	108
Rajasthan	258	342	159	5421	6180
Punjab	81	51	212	0	344
Himachal Pradesh	219	212	792	2586	3809
Jammu & Kashmir	238	212	45	5134	5629
Gujarat	180	0	0	0	180
Haryana	0	0	0	0	0
Maharashtra	371	789		11424	12584
Delhi	8	0	9	0	17
West Bengal	241	580	1277	2898	4996
Chandigarh	6	2	1	27	36
Dadra,Daman & Diu	6	8	3	113	130
Andaman	30	0	0	0	30
Lakshadweep	6	0	0	0	6
Arunachal Pradesh	60	0	0	0	60
Pondicherry	5	0	0	0	5
Total	**4936**	**7420**	**4201**	**75764**	**92321**

Source: Calculated from the currently available data from the websites of State Forest Departments.

Annexure-7.5

a) Projected Forestry Human Resources Requirements for Government Forestry Departments (High Growth)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	12508	5964	2262	688	8914
2010-11	12675	6245	2369	720	9334
2011-12	12842	6531	2477	753	9761
2012-13	13008	6822	2588	787	10197
2013-14	13175	7119	2700	821	10640
2014-15	13342	7422	2815	856	11093
2015-16	13509	7729	2932	891	11552
2016-17	13675	8042	3050	927	12019
2017-18	13842	8360	3171	964	12495
2018-19	14009	8683	3294	1001	12978
2019-20	14176	9012	3418	1039	13469

b) Projected Forestry Human Resources Requirements for Government Forestry Departments (Low Growth)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	12508	5964	2262	688	8914
2010-11	12508	6063	2299	698	9060
2011-12	12508	6162	2337	710	9209
2012-13	12508	6262	2374	721	9357
2013-14	12508	6361	2412	733	9506
2014-15	12508	6461	2450	744	9655
2015-16	12508	6560	2488	755	9803
2016-17	12508	6659	2525	767	9951
2017-18	12508	6759	2563	778	10100
2018-19	12508	6858	2601	790	10249
2019-20	12508	6958	2638	801	10397

Annexure-7.6

a) Projected Forestry Human Resources Requirements for Forest Development Corporations (High Growth)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	910	434	165	50	649
2010-11	922	454	172	52	678
2011-12	934	475	180	55	710
2012-13	946	496	188	57	741
2013-14	959	518	196	60	774
2014-15	971	540	205	62	807
2015-16	983	562	213	65	840
2016-17	995	585	222	67	874
2017-18	1007	608	231	70	909
2018-19	1019	632	240	73	945
2019-20	1031	656	249	76	981

b) Projected Forestry Human Resources Requirements for Forest Development Corporations (Low Growth)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	910	434	165	50	649
2010-11	910	441	167	51	659
2011-12	910	448	170	52	670
2012-13	910	456	173	52	681
2013-14	910	463	175	53	691
2014-15	910	470	178	54	702
2015-16	910	477	181	55	713
2016-17	910	485	184	56	725
2017-18	910	492	186	57	735
2018-19	910	499	189	57	745
2019-20	910	506	192	58	756

Annexure-7.7

Projected Forestry Human Resources Requirements for Forestry Research

Year	PG	PhD	PG & above
2009-10	75	200	275
2010-11	76	202	278
2011-12	77	204	281
2012-13	77	206	283
2013-14	78	208	286
2014-15	79	210	289
2015-16	80	212	292
2016-17	80	214	294
2017-18	81	217	298
2018-19	82	219	301
2019-20	83	221	304

Annexure-7.8

Position of Forestry Faculty in State Agricultural Universities (2009-10)

SNo	University	Sanctioned	In position	Vacant
1	UAS,Banglore	30	18	12
2	UAS,Raichur	7	2	5
3	TNAU,Coiambatore	27	21	6
4	UAS, Dharwad	28	8	20
5	UHS, Bagalkot	2	1	1
6	YSPUHF,Solan	77	50	27
7	BSKKV,Dapoli	11	9	2
8	OUAT,Bhubaneshwar	17	5	12
9	JNKVV,Jabalpur	10	5	5
10	MPUAT,Udaipur	6	5	1
11	CCSHAU,Haryana	15	12	3
12	IGKVV,Raipur	63	22	41
13	GBPUAT,pantnagar	22	16	6
14	PAU,Ludiana	17	11	6
15	AAU, Allahabad	8	8	0
	Sub-total for available universities	340	193	147
	No of universities data available	15		
	No of total universities	19		
	Estimate for all universities	431	244	186

Source: Project data

Annexure-7.9

Projected Forestry Human Resources Requirements for Forestry Education

Year	PG	PhD	UG & above
2009-10	49	195	244
2010-11	52	206	258
2011-12	54	218	272
2012-13	57	230	287
2013-14	60	242	302
2014-15	63	253	316
2015-16	66	264	330
2016-17	69	276	345
2017-18	72	288	360
2018-19	75	300	375
2019-20	78	312	390

Annexure 7.10

Projected Forestry Human Resources Requirements for Forest Based industries (Paper, wood)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	2752	10280	1781	2105	14165
2010-11	2752	10280	1781	2105	14165
2011-12	2752	10280	1781	2105	14165
2012-13	2752	10280	1781	2105	14165
2013-14	2752	10280	1781	2105	14165
2014-15	2752	10280	1781	2105	14165
2015-16	2752	10280	1781	2105	14165
2016-17	2752	10280	1781	2105	14165
2017-18	2752	10280	1781	2105	14165
2018-19	2752	10280	1781	2105	14165
2019-20	2752	10280	1781	2105	14165

Annexure-7.11

Stock Projections

a): Projected Stock Requirement (High Growth) of Forestry-educated Persons

Year	Diploma	UG	PG	PhD	UG & above
2009-10	16979	17512	4548	3400	25459
2010-11	17166	17828	4672	3450	25949
2011-12	17354	18150	4798	3501	26449
2012-13	17542	18479	4926	3554	26958
2013-14	17730	18813	5057	3607	27477
2014-15	17918	19154	5190	3660	28003
2015-16	18106	19500	5325	3714	28538
2016-17	18293	19852	5463	3770	29084
2017-18	18481	20210	5603	3826	29638
2018-19	18669	20575	5745	3883	30201
2019-20	18857	20945	5889	3940	30774

b): Projected Stock Requirement (Low Growth) of Forestry-educated Persons

Year	Diploma	UG	PG	PhD	UG & above
2009-10	16978	17512	4548	3399	25458
2010-11	16978	17623	4593	3425	25641
2011-12	16978	17735	4639	3452	25826
2012-13	16978	17847	4686	3479	26012
2013-14	16978	17959	4732	3507	26198
2014-15	16978	18071	4778	3534	26383
2015-16	16978	18183	4825	3561	26569
2016-17	16978	18295	4871	3589	26755
2017-18	16978	18407	4917	3616	26941
2018-19	16978	18519	4964	3644	27127
2019-20	16978	18631	5010	3672	27313

c): Projected Stock Requirement (Average Growth) of Forestry-educated Persons

Year	Diploma	UG	PG	PhD	UG & above
2009-10	16979	17512	4548	3399	25458
2010-11	17072	17726	4632	3437	25795
2011-12	17166	17943	4718	3476	26138
2012-13	17260	18163	4806	3516	26485
2013-14	17354	18386	4895	3557	26838
2014-15	17448	18612	4984	3597	27193
2015-16	17542	18842	5075	3637	27553
2016-17	17636	19074	5167	3679	27919
2017-18	17730	19309	5260	3721	28289
2018-19	17824	19547	5354	3763	28664
2019-20	17918	19788	5450	3806	29043

Annexure-7.12

Flow Projections

a: Projected Flow Requirement (High Growth) of Forestry-educated Persons

Year	Diploma	UG	PG	PhD	UG & above
2010-11	697	1278	420	152	1850
2011-12	703	1303	428	155	1885
2012-13	708	1327	436	158	1920
2013-14	714	1351	445	160	1957
2014-15	720	1376	454	161	1991
2015-16	725	1401	462	164	2027
2016-17	731	1426	471	167	2064
2017-18	737	1451	480	169	2100
2018-19	742	1488	488	172	2147
2019-20	748	1514	497	174	2185

b: Projected Flow Requirement (Low Growth) of Forestry-educated Persons

Year	Diploma	UG	PG	PhD	UG & above
2010-11	509	956	313	128	1397
2011-12	509	962	316	130	1408
2012-13	509	968	318	131	1417
2013-14	509	973	322	132	1427
2014-15	509	979	324	132	1435
2015-16	509	985	326	133	1443
2016-17	509	990	328	135	1453
2017-18	509	996	331	135	1462
2018-19	509	1001	333	136	1470
2019-20	509	1007	335	137	1479

c: Projected Flow Requirement (Average Growth) of Forestry-educated Persons

Year	Diploma	UG	PG	PhD	UG & above
2010-11	603	1117	367	140	1624
2011-12	606	1133	372	142	1646
2012-13	609	1147	377	144	1669
2013-14	612	1162	383	146	1692
2014-15	615	1178	389	147	1713
2015-16	617	1193	394	148	1735
2016-17	620	1208	400	151	1759
2017-18	623	1223	405	152	1781
2018-19	626	1244	411	154	1809
2019-20	629	1260	416	156	1832

Annexures for Chapter - 8

Annexure-8.1

Veterinary Colleges in India

State	University	College/faculty
Andhra Pradesh	Sri Venkateswara University, Tirupati	1. College of Veterinary Science, Hyderabad 2. College of Veterinary Science, Tirupati 3. N.T.Ramarao College of Veterinary Science, Gannavaram 4. College of Vety Science, Korutla, Karimnagar Dist* 5. College of Veterinary Science, Proddatur *
Arunachal Pradesh	CAU	6. School of Veterinary Science & Animal Husbandry, Pasighat
Assam	Assam Agricultural University, Jorhat	7. Faculty of Veterinary Science, Guwahati 8. College of Veterinary Science, Azad, Lakhimpur
Bihar	Rajendra Agricultural University, Pusa Samastipur	9. Bihar Veterinary College, Patna 10. Faculty of Veterinary Sciences, Pusa
Chhattis-garh	Indira Gandhi Krishi Viswavidyalay, Raipur	11. College of Veterinary Science & Animal Husbandry, Anjora, Durg
Goa		12. Bharati Vet College, Goa **
Gujarat	a) Anand Agricultural University, Anand b) Sardar Krushinagar Dantiwada Agricultural University c) Navsari Krishi Vishwavidyalay, Navsari d) Junagarh Krishi Vishwavidyalay, Junagarh	13. College of Veterinary Science & Animal Husbandry, Anand 14. College of Veterinary Science & Animal Husbandry, S.K.Nagar 15. College of Veterinary Science, Navsari * 16. College of Veterinary Science, Junagarh *
Haryana	CCS Haryana Agricultural University	17. College of Veterinary Sciences, Hissar
Himachal Pradesh	CSK Himachal Pradesh Krishi Vishwavidyalay, Palampur	18. College of Veterinary and Animal Sciences, Palampur
Jammu & Kashmir	a)Sher-e- Kashmir University of Agricultural Science & Technology University, Srinagar b)Sher-e- Kashmir University of Agricultural Science & Technology University, Srinagar	19. Faculty of Veterinary Sciences & Animal Husbandry, Srinagar 20. Faculty of Veterinary Science & Animal Husbandry, Jammu *
Jharkhand	Birsa Agricultural University, Ranchi	21. Faculty of Veterinary Science & Animal Husbandry, Ranchi
Karnataka	Karnataka Veterinary, Animal & Fishery Sciences University, Bidar	22. College of Veterinary Science, Bengaluru 23. College of Veterinary Science, Bidar *24. College of Veterinary Science, Shimoga** *25. College of Veterinary Science, Hasan **
Kerala	Kerala Agricultural University, Thrissur	26. College of Veterinary & Animal Sciences, Mannuthy, 27. College of Veterinary & Animal Sciences, Pookote
Madhya Pradesh	Jawaharlal Nehru Krisghi Viswavidyalay, Jabalpur	28. College of Veterinary Science & Animal Husbandry, Jabalpur 29. College of Veterinary Science & Animal Husbandry, Mhow *30. College of Veterinary Science & Animal Husbandry,*

		*Rewa**
Maha-rashtra	Maharashtra Animal & Fishery Sciences University, Nagpur	31. College of Veterinary and Animal Sciences, Udgir 32. College of Veterinary and Animal Sciences, Parbhani 33. K.N.P. College of Veterinary Sciences, Shirwal 34. Nagpur Veterinary College, Nagpur 35. Bombay Veterinary College, Parel, Mumbai
	PKV, Akola	36. Veterinary College, PKV, Akola 444 104
Mizoram	Central Agricultural University, Imphal	37. College of Veterinary Science & Animal Husbandry, Aizawl
Orissa	Orissa University of Agriculture & Technology, Bhubaneswar	38. College of Veterinary Science & Animal Husbandry, Bhubaneswar
Pudu-cherry	Pondicherry University, Pondicherry	39. Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry
Punjab	Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana	40. College of Veterinary Science, Ludhiana
Rajasthan	Rajasthan University of Veterinary and Animal Sciences, Bikaner***	41. College of Veterinary and Animal Science, Bikaner 42. College of Veterinary and Animal Science, Navania , Vallabhnagar, Udaipur 43. College of Veterinary and Animal Science, Jodhpur *44. Apollo College of Veterinary Medicine, Jaipur* *45. Mahatma Gandhi Veterinary College, Bharatpur* ** *46. Mahata Jyotiba Fule College of Veterinary &Animal Sciences, Chomu**.* *47. Arawali Veterinary College, Sikar*** *48. Sri Gganganagar Veterinary College , Sriganaganagar.*** *49. B.S.College of Veterinary Medicine & Research Centre, Jhunjhunu.*** 50. *M.B. Veterinary College, Dungarpur***
Tamil Nadu	Tamil Nadu Veterinary and Animal Sciences University, Chennai	51. Madras Veterinary College, Chennai 52. Veterinary College and Research Institute, Namakkal 53. Veterinary College and Research Institute, Thirunalveli* 54. Veterinary College and Research Institute, Tanjavur*
Uttar Pradesh	a) Uttar Pradesh Pandit Deen Dayal Upadhyay Pashu Chikitsa Vigyan Evam Go-Anusandhan Sansthan, Mathura	55. College of Veterinary Science & Animal Husbandry, Mathura
	b) Narendra Dev University of Agriculture & Technology, Faizabad	56. College of Veterinary Science, Faizabad *
	c) Sardar Vallabhbhai Patel Agriculture and technology University, Meerut	57. *College of Veterinary and Animal Science, Meerut* *
Uttara-khand	Govind Ballbh Pant University of Agriculture & Technology, Pantnagar	58. College of Veterinary Science, Pantnagar
West Bengal	West Bengal University of Animal & Fishery Sciences, Kolkata	59. Faculty of Veterinary and Animal Sciences, Kolkata

Source: Vet colleges data obtained for the project from SAUs; VCI Web Site had 39 colleges as on 23-6-2010.

* These 12 constituent colleges of respective universities are also not on the VCI recognized list.

** These eight private colleges are not on the VCI recognized list.

*** All Veterinary colleges in Rajasthan came under the new university RUVAS, Bikaner.

Annexure-8.2

Students Admitted and Passed in Veterinary & Animal Husbandry Courses during 2009-10

University	Diploma		UG		PG		PhD	
	Admit	Pass	Admit	Pass	Admit	Pass	Admit	Pass
AAU, Allahabad			0	0	2	2	1	3
AAU, Anand			55	55	53	52	17	5
AAU,Jorhat			100	87	15	28	4	3
BAU, Ranchi			37	NA	4	NA	11	NA
BCKV,Mohanpur			0	0	0	0	2	0
BHU, Varnasi			0	0	8	4	4	0
CAU, Imphal			58	NA	16	NA	0	0
CCSHAU, Haryana			76	50	35	24	10	1
CSKHPKV, Palampur			47	31	39	7	0	4
CSUAST, Kanpur			0	0	2	3	1	0
GADVASU, Ludhiana			73	60	45	32	13	8
GBPUAT, Panthnagar			50	56	37	37	6	5
IGKV, Raipur			43	45	21	NA	2	0
IVRI, Izathnagar			0	0	124	85	82	33
JAU,Junagadh			29	NA	1	0	3	0
JNKV, Jabalpur			95	87	18	15	0	0
KAU, Trissur			120	113	49	36	5	2
KVAFSU,Bidar			213	102	45	61	7	9
MAFSU, Nagpur	4693	2917	253	240	NA	127	NA	6
NAU, Navsari			30	NA	4	NA	0	0
NDUAT,Faizabad			NA	NA	0	0	0	0
NDRI, Karnal			0	0	47	0	NA	14
OUAT, Bhubaneswar			75	80	40	22	0	0
RAU, Pusa			60	49	17	49	0	0
SKDAU,Dantiwada	53	49	62	42	24	28	5	1
SKRAU, Bikanir			80	70	0	0	0	0
SKUAST, Jammu			57	67	59	17	6	0
SKUAST, Kashmir			64	63	15	13	5	1
SVVU, Tirupathi	177	170	244	200	45	0	4	0
TANVASU, Chennai	2	0	225	186	68	69	18	19
UPPDDU, Mathura			57	49	38	49	0	0
WBUAFS, Belgachia			65	29	47	37	24	11
Bharati Vet College, Goa*			45	NA	0	0	0	0
Vet College, PU, Pondicherry*			45	NA	15	0	0	0
Grand Total	**4925**	**3136**	**2358**	**1761**	**933**	**797**	**230**	**125**

*PU and Bharati Veterinary Colleges are not under SAUs

Annexure-8.3

Number of Veterinarians on the Indian Veterinary Practitioners' Register (VCI)

Year (end of)	No. registered With VCI	Cumulative total	% of veterinarians above the age of 60 years (based on 10% sample study)	Estimated number of veterinarians below 60 years of age	Cumulative total of veterinarians below 60 years of age
1994	10024	10024	32.1	6806	6806
1995	7982	18006	42.4	4598	11404
1996	2936	20942	39.9	1765	13168
1997	2221	23163	30.9	1535	14703
1998	7384	30547	29.4	5213	19916
1999	2272	32819	10.7	2029	21945
2000	2817	35636	16.7	2347	24292
2001	2647	38283	2.2	2065	26356
2002	1472	39755	1.5	1450	27806
2003	1399	41154	3.0	1357	29163
2004	1431	42585	3.0	1388	30551
2005	928	43513	3.5[@]	896	31447
2006	4278	47791	4.6	4081	35528
2007	2855	50646	3.5[@]	2755	38283
2008	1780	52426	3.5[@]	1718	40001
2,009	2881	55307	3.5[@]	2780	42781
Total		55307	22.6	42781	42781

Source: Veterinary Council of India ; Sample study of registrants carried out by IAMR using the year of birth of registrants posted on the VCI web-site

[@]For the year 2005 data on date of birth are not posted on the VCI Web-site. Further, data for the years 2007 to 2009 are not yet available on the web-site. Hence, for 2005 and 2007 to 2009, the average per cent for the years2001 to 2004 and 2006 has been used.

Annexure-8.4

The World Organization for Animal Health (OIE) Estimation of Veterinary Personnel in India (1997-2007)

Year	Veterinarians								
	Animal Health (Public)	Animal Health (Private)	Labs (Govt.)	Labs (Private)	Academic /Training Institutes	Private Pharma Industry	Independent Private vets.	Others	Total
1997	31150	1725	3000	NA	NA	NA	NA	1325	37200
1998	31200	1750	3000	NA	NA	NA	NA	1350	37300
1999	31250	1775	3000	NA	NA	NA	NA	1375	37400
2000	31300	1800	3025	NA	NA	NA	NA	1400	37525
2001	31350	1825	3050	NA	NA	NA	NA	1425	37650
2002	31425	1900	3075	NA	NA	NA	NA	1475	37875
2003	31495	1975	3105	NA	NA	NA	NA	1525	38100
2004	31555	2060	3135	NA	NA	NA	NA	1575	38325
2005	38271	2150	3170	NA	NA	NA	NA	1620	45211
2006	38271	2150	3170	NA	NA	NA	NA	1620	45211
2007	38271	2150	3170	NA	NA	NA	NA	1620	45211
2008	38271	2150	3170	NA	NA	NA	NA	1620	45211

Source: OIE, OIE-WAHID Interface, www.oie.int/eng/info/en_infold.htm

Annexure-8.5

Projected Stocks of Veterinarians Required on the Basis of Constant Overall Growth Rates

Year	Projections based on rate of growth in veterinarians			Projected Number of Livestock Units (bovine equivalents) (millions)	Projections based on the norm of		
	4%	6%	Average		10000 LSU per vet	5000 LSU per vet	Average
2009-10	43000	43000	43000	446.64	44664	89329	66997
2010-11	4720	45580	45150	450.39	45039	90079	67559
2011-12	46509	48315	47412	454.16	45416	90832	68124
2012-13	48369	51214	49791	457.94	45794	91587	68690
2013-14	50304	54287	52295	461.73	46173	92346	69259
2014-15	52316	57544	54930	465.54	46554	93108	69831
2015-16	54409	60996	57703	469.36	46936	93873	70405
2016-17	56585	64656	60621	473.21	47321	94641	70981
2017-18	58848	68535	63692	477.07	47707	95414	71560
2018-19	61202	72648	66925	480.95	48095	96189	72142
2019-20	63651	77006	70328	484.85	48485	96969	72727

LSU = Livestock unit

Annexure-8.6

Projections of Required Stocks of Veterinarians for Public Animal Health Services (High Growth)

Year	**Diploma**	**UG**	**PG**	**PhD**	**All UG & above**
2009-10	13068	16500	4400	1100	22000
2010-11	13460	16995	4532	1133	22660
2011-12	13864	17505	4668	1167	23340
2012-13	14280	18030	4808	1202	24040
2013-14	14708	18571	4952	1238	24761
2014-15	15149	19128	5101	1275	25504
2015-16	15604	19702	5254	1313	26269
2016-17	16072	20293	5411	1353	27057
2017-18	16554	20902	5574	1393	27869
2018-19	17051	21529	5741	1435	28705
2019-20	17562	22175	5913	1478	29566

Projections of Required Stocks of Veterinarians for Public Animal Health Services (Low Growth)

Year	No. of Veterinary personnel required with the norm of 5000 LSUs per veterinarian				
	Diploma	**UG**	**PG**	**PhD**	**All UG & above**
2009-10	13068	16500	4400	1100	22000
2010-11	13307	16830	4488	1122	22440
2011-12	13573	17167	4578	1144	22889
2012-13	13845	17510	4669	1167	23347
2013-14	14121	17860	4763	1191	23814
2014-15	14404	18217	4858	1214	24290
2015-16	14692	18582	4955	1239	24776
2016-17	14986	18953	5054	1264	25271
2017-18	15285	19332	5155	1289	25777
2018-19	15591	19719	5258	1315	26292
2019-20	15903	20113	5364	1341	26818

Annexure-8.7

Projections of Required Stocks of Veterinarians for Private Animal Healthcare Services

Year	No. of Veterinary personnel required				
	Diploma	**UG**	**PG**	**PhD**	**All UG & above**
2009-10	6000	3000	800	200	4000
2010-11	6600	3450	920	230	4600
2011-12	7200	3900	1040	260	5200
2012-13	7800	4350	1160	290	5800
2013-14	8400	4800	1280	320	6400
2014-15	9000	5250	1400	350	7000
2015-16	9600	5700	1520	380	7600
2016-17	10200	6150	1640	410	8200
2017-18	10800	6600	1760	440	8800
2018-19	11400	7050	1880	470	9400
2019-20	12000	7500	2000	500	10000

Annexure-8.8

ICAR's Scientists in Veterinary Science Division as on March 2010

SNo.	Name of the Institute	Scientists		Per Cent Filled
		Sanctioned	In position	
1.	CARI, Izatnagar	50	40	80
2.	CIRG, Makhdoom	50	31	62
3.	NBAGR, Karnal	35	28	80
4.	NIANP, Bangalore	40	35	87.5
5.	CSWRI, Avikanagar	90	56	62.2
6.	IVRI, Izatnagar	334	231	69.1
7.	PDC, Meerut	20	15	75
8.	PDP, Hyderabad	15	15	100
9.	CIRB, Hisar	40	31	77.5
10.	NCAP, New Delhi	25	17	68
11.	NRC on Camel, Bikaner	**20**	**16**	**80**
12.	NRC Equines, Hisar	**35**	**30**	**85.7**
13.	NRC on Pig, Assam	15	10	66.7
14.	NRC Yak, Dirang	15	09	60
15.	NRC Meat, Hyd.	15	12	80
16.	NRC Mithun	15	11	73.33
17.	PD-ADMAS	15	12	80
18.	PDFMD, Mukteswar	15	10	66.7
TOTAL		**844**	**609**	**72.1**

Annexure-8.9

Projections of Required Stocks of Veterinarians for Research

Year	UG	PG	PhD	All UG & above
2009-10	-	240	960	1200
2010-11	-	250	1000	1250
2011-12	-	260	1040	1300
2012-13	-	270	1080	1350
2013-14	-	280	1120	1400
2014-15	-	300	1200	1500
2015-16	-	320	1280	1600
2016-17	-	340	1360	1700
2017-18	-	360	1440	1800
2018-19	-	380	1520	1900
2019-20	-	400	1600	2000

Annexure-8.10

SAU's Scientists and Faculty in Veterinary Science Sector as on March 2010

SNo	University	Sanctioned	In position	Vacant
1	UAS,Banglore	16	12	4
2	AAU,Anand	90	65	25
3	JAU,Junagadh	27	9	18
4	KAFSU,Bidar	496	123	373
5	WBUAFS,Kolakata	96	51	45
6	SKDAU,Dantiwada	29	16	13
7	UAS, Dharwad	18	10	8
8	UHS, Bagalkot	2	1	1
9	YSPUHF,Solan	1	1	0
10	GADVASU,Ludiana	142	89	53
11	OUAT,Bhubaneshwar	79	54	25
12	KAU,Kerala	238	168	70
13	MAFSU,Nagpur	536	340	196
14	TANVASU,Chennai	591	480	111
15	SVVU,Tirupathi	581	200	381
16	CCSHAU,Hissar	136	103	33
17	IGKVV,Raipur	105	42	63
18	RAU,Pusa	85	41	44
19	JNKVV,Jabalpur	97	53	44
20	MPKV,Rahuri	81	18	63
21	UPPDDU,Mathura	179	146	33
22	BAU,Ranchi	84	44	40
23	GBPUAT,Panthnagar	44	0	44
24	AAU,Jorhat	296	126	170
25	SKRAU,Bikaner	91	47	44
26	PU,Pondicherry	59	2	57
Sub-total for available universities (26)		4199	2241	1958
Estimate for all 33 unviersities		5330	2844	2486

Source: project data

Annexure-8.11

Projections of Required Stocks of Veterinarians for Veterinary Science Education

Year	PG	PhD	All UG & above
2009-10	440	1760	2200
2010-11	459	1837	2297
2011-12	480	1918	2398
2012-13	501	2003	2503
2013-14	523	2091	2614
2014-15	546	2183	2729
2015-16	570	2279	2849
2016-17	595	2379	2974
2017-18	621	2484	3105
2018-19	648	2593	3241
2019-20	677	2707	3384

Annexure-8.12

Projections of Required Stocks of Veterinarians for Dairy Industry

Year	Diploma	UG	PG	PhD	All UG & above
2009-10	500	250	167	83	500
2010-11	530	265	177	88	530
2011-12	562	281	187	94	562
2012-13	596	298	199	99	596
2013-14	631	316	210	105	631
2014-15	669	335	223	112	669
2015-16	709	355	236	118	709
2016-17	752	376	251	125	752
2017-18	797	398	266	133	797
2018-19	845	422	282	141	845
2019-20	895	448	298	149	895

Annexure-8.13

Projections of Required Stocks of Veterinarians for Veterinary Pharmaceutical Industry

Year	Diploma	UG	PG	PhD	All UG & above
2009-10	24	732	300	144	1176
2010-11	26	805	330	158	1294
2011-12	29	886	363	174	1423
2012-13	32	974	399	192	1565
2013-14	35	1072	439	211	1722
2014-15	39	1179	483	232	1894
2015-16	43	1297	531	255	2083
2016-17	47	1426	585	281	2292
2017-18	51	1569	643	309	2521
2018-19	57	1726	707	340	2773
2019-20	62	1899	778	373	3050

Annexure-8.14

Projections of Required Stocks of Veterinarians for Animal Feed Industry

Year	Diploma	UG	PG	Ph	All UG & above
2009-10	1953	1424	781	42	2247
2010-11	2148	1566	859	46	2472
2011-12	2363	1723	945	51	2719
2012-13	2599	1895	1040	56	2991
2013-14	2859	2085	1144	61	3290
2014-15	3145	2293	1258	68	3619
2015-16	3460	2522	1384	74	3981
2016-17	3806	2775	1522	82	4379
2017-18	4186	3052	1675	90	4817
2018-19	4605	3357	1842	99	5298
2019-20	5066	3693	2026	109	5828

Annexure-8.15

Projections of Required Stocks of Veterinarians for Animal Breeding farms

Year	Diploma	UG	PG	PhD	All UG &above
2009-10	78	510	353	59	922
2010-11	86	561	388	59	1008
2011-12	94	612	424	59	1095
2012-13	101	663	459	59	1181
2013-14	109	714	494	59	1267
2014-15	117	765	530	59	1354
2015-16	125	816	565	59	1440
2016-17	133	867	600	59	1526
2017-18	140	918	635	59	1612
2018-19	148	969	671	59	1699
2019-20	156	1020	706	59	1785

Annexure-8.16

Projections of Required Stocks of Veterinarians for Meat Products industry

Year	Diploma	UG	PG	PhD	All UG & above
2009-10	161	591	322	107	1020
2010-11	177	650	354	118	1122
2011-12	195	715	390	130	1235
2012-13	214	786	429	143	1358
2013-14	236	865	472	157	1494
2014-15	259	951	519	173	1643
2015-16	285	1047	571	190	1808
2016-17	314	1151	628	209	1988
2017-18	345	1266	691	230	2187
2018-19	380	1393	760	253	2406
2019-20	418	1532	836	279	2647

Annexure-8.17

Projections of Required Stocks of Veterinarians for Financial Services

Year	UG	PG	PhD	All UG & above
2009-10	3150	350	-	3500
2010-11	3229	359	-	3588
2011-12	3309	368	-	3677
2012-13	3392	377	-	3769
2013-14	3477	386	-	3863
2014-15	3564	396	-	3960
2015-16	3653	406	-	4059
2016-17	3744	416	-	4160
2017-18	3838	426	-	4264
2018-19	3934	437	-	4371
2019-20	4032	448	-	4480

Annexure-8.18

a) Overall Projections of Requirements Stocks of Veterinary Human Resources (High Growth)

Year	Diploma	UG	PG	PhD	UG and above
2009-10	23963	28772	8873	4521	42166
2010-11	25331	30273	9392	4740	44405
2011-12	26737	31824	9933	4967	46724
2012-13	28185	33427	10497	5203	49127
2013-14	29677	35089	11086	5447	51621
2014-15	31217	36811	11713	5744	54268
2015-16	32808	38600	12369	6051	57021
2016-17	34455	40461	13058	6369	59888
2017-18	36162	42398	13781	6699	62878
2018-19	37934	44418	14542	7040	66001
2019-20	39775	46528	15344	7395	69267

b) Overall Projections of Requirements Stocks of Veterinary Human Resources (Low Growth)

Year	Diploma	UG	PG	PhD	UG and above
2009-10	23963	28772	8873	4521	42166
2010-11	25162	30092	9344	4728	44163
2011-12	26417	31452	9834	4942	46228
2012-13	27706	32855	10344	5164	48364
2013-14	29031	34307	10877	5394	50578
2014-15	30397	35810	11446	5677	52932
2015-16	31805	37368	12041	5969	55378
2016-17	33260	38987	12665	6271	57923
2017-18	34767	40672	13321	6583	60576
2018-19	36328	42428	14011	6907	63346
2019-20	37950	44261	14740	7243	66244

c) Overall Projections of Requirements Stocks of Veterinary Human Resources (Average Growth)

Year	Diploma	UG	PG	PhD	UG and above
2009-10	23963	28772	8873	4521	42166
2010-11	25234	30182	9368	4734	44284
2011-12	26564	31638	9883	4955	46476
2012-13	27932	33141	10420	5184	48745
2013-14	29341	34698	10981	5421	51100
2014-15	30793	36310	11579	5711	53600
2015-16	32292	37984	12205	6010	56199
2016-17	33843	39724	12861	6320	58905
2017-18	35449	41535	13551	6641	61727
2018-19	37115	43423	14277	6974	64674
2019-20	38846	45395	15042	7319	67756

Annexure-8.19

a) Projected Outturn of Required Veterinarians (High Growth)

Year	Diploma	UG	PG	PhD	UG and above
2010-11	2087	3705	1185	355	5246
2011-12	2166	3862	1283	369	5514
2012-13	2250	4039	1341	384	5764
2013-14	2338	4214	1403	400	6018
2014-15	2430	4401	1480	461	6342
2015-16	2528	4608	1550	480	6638
2016-17	2631	4829	1625	499	6954
2017-18	2741	5063	1715	520	7299
2018-19	2856	5307	1810	542	7660
2019-20	2980	5565	1912	566	8043

b) Projected Outturns of Required Veterinarians (Low Growth)

Year	Diploma	UG	PG	PhD	UG and above
2010-11	1918	3450	1122	253	4825
2011-12	2010	3587	1215	262	5063
2012-13	2081	3743	1268	271	5282
2013-14	2157	3897	1324	282	5503
2014-15	2236	4061	1395	337	5793
2015-16	2320	4245	1460	349	6053
2016-17	2409	4441	1529	362	6331
2017-18	2504	4650	1612	375	6637
2018-19	2605	4868	1701	390	6959
2019-20	2712	5100	1796	405	7301

c) Projected Outturns of Required Veterinarians (Average Growth)

Year	Diploma	UG	PG	PhD	UG and above
2010-11	2003	3578	1154	304	5035
2011-12	2088	3724	1249	316	5289
2012-13	2166	3891	1305	328	5523
2013-14	2247	4056	1364	341	5760
2014-15	2333	4231	1438	399	6067
2015-16	2424	4426	1505	414	6346
2016-17	2520	4635	1577	431	6642
2017-18	2622	4857	1663	448	6968
2018-19	2731	5087	1755	466	7309
2019-20	2846	5332	1854	486	7672

Annexures for Chapter - 9

Annexure-9.1

List of Institutions Offering Education in Fishery Sciences

State	University	College/faculty
Andhra Pradesh	Sri Venkateshwara Veterinary University, Tirupati.	1. College of Fishery Science, Muthukur, Dist: Nellore
Assam	Assam Agriculture University (AAU) Jorhat,	2. College of Fisheries, Raha, Nagaon
Bihar	Rajendra Agricultural University, Pusa Samastipura - 848125	3.College of Fisheries, Dholi, Muzaffarpur
Chhatisgarh	Indira Gandhi Krishi Vishwavidyalaya (*IGKVV*), Raipur	4.PG College
Gujarat	Junagadh Agricultural University (JAU), Junagadh Gujarat 362001	5. College of Fisheries, Junagadh
Haryana	CCSHAU, Hisar	6. PG College
Himachal Pradesh	CSKHPKVV,Palampur	7. College of veterinary and Animal Sciences(Dept. of Fisheries)
Jammu& kashmir	Sher-e-Kashmir University of Agricultural Sciences & Tech. (SKUAST-K),	8. Faculty of Fisheries, Rangil, Ganderbal.
Karnataka	Karnataka Veterinary, Animal & Fisheries Sciences University,Bidar	9. College of Fisheries, Mangalore, Dakshina Kannada Dist
Kerala	Kerala Agricultural University (KAU), Kerala.	10. College of Fisheries, Panangad P.O, Ernakulam District
	Cochin University of Science & Technology	11. St.Albert's College, Kochi.
Maha-rashtra	BSKKV, Dapoli	12. College of Fisheries, Udgir, Dist: Rathnagiri
	Maharashtra Animal &Fishery Science University, Nagpur	13. College of Fisheries,Nagpur 14. College of Fisheries,Udgir
	Central Institute of Fisheries Education (CIFE), Mumbai	15. Central institute of Fisheries Education, Mumbai
Mizoram	Central Agricultural University, Imphal	16. College of Fisheries, Lembuchera, Agartala
Orissa	Orissa University of Agriculture & Technology, Bhubaneswar	17. College of Fishery Science, Rangeilunda 18. College of Engineering & Technology, Fisheries, Bhubaneswar
Punjab	Guru Angad Dev Veterinary	19. College of Fisheries Science, Ludhiana

	and Animal Sciences University, Ludhiana	
Rajasthan	Maharana Pratap Agriculture and Technology University, Udaipur	20. College of fisheries, Udaipur
Tamil Nadu	Tamil Nadu Veterinary and Animal Sciences University, Chennai, 641003	21. Fisheries College and Research Institute, Thoothukudi
Uttar Pradesh	Narendra Deva University of Agriculture and Technology Kumarganj – Faizabad	22. College of Fisheries, Faizabad
Uttaranchal	Govind Ballabh Pant University Agriculture and Technology (GBPAUT), Pantnagar, Uttaranchal	23. College of Fisheries, Pantnagar, Uttaranchal
West Bengal	West Bengal University of Animal and Fishery Sciences.	24. Faculty of Fishery Sciences, Kshundiram Bose Sarani, Kolkata
	IIT, Kharagpur*	25. Dept of Agriculture & Food Engineering

* Central Institution

Annexure-9.2

Students Admitted and Passed in Fishery Science Courses during 2009-10

Universities	Diploma		UG		PG		PhD	
	Admit	Pass	Admit	Pass	Admit	Pass	Admit	Pass
AAU,Jorhat	NA	NA	20	17	0	0	0	0
BSKV, Dapoli	NA	NA	33	30	9	10	1	1
CAU, Imphal	NA	NA	23	18	5	2	0	0
CCSHAU, Hissar	NA	NA	0	0	2	1	1	1
CIFE, Mumbai	NA	NA	0	0	40	30	20	10
CSKHPKV, Palampur	NA	NA	46	38	0	0	0	0
GADVASU, Ludhiana	NA	NA	15	NA	7	0	0	0
GBPUAT, Panthnagar	NA	NA	26	13	10	8	2	8
IGKV, Raipur	NA	NA	0	0	10	5	0	0
JAU,Junagadh	NA	NA	36	7			0	0
KAU, Trissur	NA	NA	43	44	3	5	0	0
KVAFSU,Bidar	NA	NA	45	16	30	12	4	9
MAFSU, Nagpur	NA	NA	54	27	0	0	0	0
MPUAT, Udaipur	NA	NA	25	NA	0	0	0	0
OUAT, Bhubaneswar	NA	NA	30	18	3	2	0	0
RAU, Pusa	NA	NA	25	10	0	0	0	0
SKUAST, Kashmir	NA	NA	14	NA	2	2	0	0
SVVU, Tirupathi	26	NA	21	NA	6	0	0	0
TANVASU, Chennai	NA	NA	35	25	22	10	NA	1
WBUAFS, Belgachia	NA	NA	39	22	19	22	0	0
NDUAT,Faizabad	NA	NA	NA	NA	0	0	0	0
CUST, Cochin*	NA	NA	22	NA	38	0	6	NA
Grand Total	**26**	**NA**	**552**	**285**	**206**	**109**	**34**	**30**

*CUST, Cochin is not under SAUs

Annexure-9.3

Earlier Human Resources Forecasts in Fisheries Sector

Author(s)	Period of projections	Estimated demand	Comments on the estimates
Chidambaram (1985)	Ten years from 1985	Graduates and port graduates 23,000 Other technical human resources 1,59,000	Estimates for the whole period
Pathak *et al* (1997)	IX Plan (1997-2002)	7 million	Estimates for the whole period
Singh and Sontakki (1997)	IX Plan (1997-2002)	40,000	For fisheries extension only. Estimates for the whole period
Ghosh (1997)		Fisheries graduates 1600 Post graduates 400 **per annum**	The estimates are per annum
Somavanshi and John (1997)	End of X Plan (2002-07)	Certified human resources 1000	For exploration of deep sea and oceanic resources
Diwan and Suseelan (1997)	Not available	4.48 lakh graduates and 1.49 lakh post-graduates	Only for brackish water aquaculture (shrimp industry)
Kohli (1998)	Not available	750 teachers and 1200 technical officers	For fisheries education only. Not known if the requirement is per year or total.

Source: Report of the Brainstorming session on Human resources Requirements and HRD in Fisheries Sector, organized by CIFE, 2000,

Annexure-9.4

Projections of Fish Production and Fish Processed

Year	Projected Fish production ('000 Tonnes)		% processed	Quantity Processed ('000 tonnes)	
	High (6% growth)	Low (4% growth)		High (6% growth)	Low (4% growth)
2008-09	7555	7412	14	1058	1038
2009-10	8008	7709	15	1201	1156
2010-11	8488	8017	16	1358	1283
2011-12	8998	8338	17	1530	1417
2012-13	9538	8671	18	1717	1561
2013-14	10110	9018	19	1921	1713
2014-15	10716	9379	20	2143	1876
2015-16	11359	9754	21	2385	2048
2016-17	12041	10144	22	2649	2232
2017-18	12763	10550	23	2936	2426
2018-19	13529	10972	24	3247	2633
2019-20	14341	11411	25	3585	2853

Annexure-9.5

Projections of Fish Processing Industries Using Annual Survey of Industries Data

Year	**No. of working factories**	**Total number of persons engaged**	**Average number of persons per unit**
2000-01	260	27,065	104
2001-02	256	23,649	92
2002-03	264	31,844	121
2003-04	281	32,426	115
2004-05	283	32,240	114
2005-06	318	34,496	108
Projections			
2006-07	316	36,638	116
2007-08	327	38,452	118
2008-09	338	40,267	119
2009-10	349	42,081	121
2010-11	360	43,896	122
2011-12	371	45,711	123
2012-13	382	47,525	124
2013-14	393	49,340	125
2014-15	404	51,154	126
2015-16	416	52,969	127
2016-17	427	54,783	128
2017-18	438	56,598	129
2018-19	449	58,413	130
2019-20	460	60,227	131

Annexure-9.6

Projected Number of Fish Processing Units and Employment in the High and Low Growth Scenarios

Year	High Growth Scenario			Low Growth Scenario		
	Quantity to be processed (000 tonnes)	No. of units required (@2,835 tonnes per unit)	No. of persons to be engaged (@ an average rate of 125 per unit)	Quantity to be processed (000 tonnes)	No. of units required (@2,835 tonnes per unit)	No. of persons to be engaged (@ an average rate of 125 per unit)
2009-10	1266	447	52962	1079	381	50983
2010-11	1470	519	59883	1203	424	56557
2011-12	1700	600	67443	1334	471	62495
2012-13	1959	691	75695	1474	520	68818
2013-14	2251	794	84694	1623	572	75547
2014-15	2578	909	94501	1782	629	82704
2015-16	2947	1040	105179	1951	688	90313
2016-17	3359	1185	116799	2130	751	98398
2017-18	3823	1349	129435	2321	819	106986
2018-19	4341	1531	143166	2523	890	116103
2019-20	4922	1736	158079	2739	966	125778

Annexure-9.7

(a) Requirement of Fishery Educated Persons in Fish-processing (Low Growth)

Year	Certificate/ Informally trained	Diploma	UG	PG	PhD
2009-10	2427	1066	3350	597	92
2010-11	2692	1182	3716	662	102
2011-12	2975	1306	4106	731	112
2012-13	3276	1438	4521	805	124
2013-14	3596	1579	4963	884	136
2014-15	3937	1729	5434	968	149
2015-16	4299	1888	5934	1057	163
2016-17	4684	2057	6465	1151	177
2017-18	5093	2236	7029	1252	193
2018-19	5526	2427	7628	1358	209
2019-20	5987	2629	8264	1472	226

(b) Requirement of Fishery Educated Persons in Fish-processing (High Growth)

Year	Certificate/ Informally trained	Diploma	UG	PG	PhD
2009-10	2427	1066	3350	597	92
2010-11	2850	1252	3934	701	108
2011-12	3210	1410	4431	789	121
2012-13	3603	1582	4973	886	136
2013-14	4031	1770	5564	991	152
2014-15	4498	1975	6209	1106	170
2015-16	5007	2198	6910	1231	189
2016-17	5560	2441	7674	1367	210
2017-18	6161	2705	8504	1514	233
2018-19	6815	2992	9406	1675	258
2019-20	7525	3304	10386	1850	285

Annexure-9.8

Human Resources Requirements in Fish Seed Hatcheries

Year	Human resources required			
	Certificate/ Informally trained	Diploma	UG	PG
2009-10	23380	32784	1107	221
2010-11	24570	34440	1167	233
2011-12	25776	36144	1220	244
2012-13	27090	37972	1287	257
2013-14	28425	39855	1347	269
2014-15	29844	41845	1413	283
2015-16	31348	43947	1487	297
2016-17	32911	46140	1560	312
2017-18	34565	48455	1640	328
2018-19	36284	50870	1720	344
2019-20	38102	53416	1807	361

Annexure-9.9

Number of Aquaculture Units Registered with CAA by March 2010

State	Number of Aquaculture units registered with CAA
Andhra Pradesh	12,099
Daman and Diu	12
Goa	27
Gujarat	442
Karnataka	268
Orissa	2,277
Maharashtra	215
Puducherry	02
Tamil Nadu	1,353
West Bengal	1,089
Total	**18,630**

Source: Coastal Aquaculture Authority, Annual Reports

Annexure-9.10

Structure of Coastal Aquaculture Fish Farms in India

Size (ha)	No. of Farms	% distribution by size
0-2	9,888	83.5
2-5	1,746	14.8
5-10	166	1.4
10-40	30	0.25
>40	7	0.06
Total	11,837	100.0

Source: Annual Report 2008-09 of Coastal Aquaculture Authority

Annexure-9.11

Projections of Human Resource Needs of Aquaculture

Year	LOW projection				HIGH projection			
	Certificate	Diploma	UG	PG	Certificate	Diploma	UG	PG
2009-10	96826	90595	1793	299	96826	90595	1793	299
2010-11	102636	96031	1901	317	104572	97843	1937	323
2011-12	108794	101793	2015	336	112938	105670	2092	349
2012-13	115321	107900	2136	356	121973	114124	2259	377
2013-14	122241	114374	2264	377	131731	123253	2440	407
2014-15	129575	121237	2400	400	142269	133114	2635	439
2015-16	137350	128511	2544	424	153651	143763	2846	474
2016-17	145591	136221	2697	449	165943	155264	3073	512
2017-18	154326	144395	2858	476	179218	167685	3319	553
2018-19	163585	153058	3030	505	193556	181100	3585	598
2019-20	173401	162242	3212	535	209040	195588	3872	645

Annexure-9.12

Projections of Human Resources Needs of Deep Sea Fishing

Year	Deep sea vessels	Certificate	Diploma	UG	PG
2009-10	60	900	900	150	30
2010-11	74	1110	1110	185	37
2011-12	88	1320	1320	220	44
2012-13	102	1530	1530	255	51
2013-14	116	1740	1740	290	58
2014-15	130	1950	1950	325	65
2015-16	144	2160	2160	360	72
2016-17	158	2370	2370	395	79
2017-18	172	2580	2580	430	86
2018-19	186	2790	2790	465	93
2019-20	200	3000	3000	500	100

Annexure-9.13

a) Projections for Fisheries Development and Extension Agencies (High Growth)

Year	Certificate/ Informally trained	Diploma	UG	PG	PhD
2009-10	3644	547	3079	702	34
2010-11	4008	602	3387	773	37
2011-12	4373	657	3695	843	41
2012-13	4737	711	4003	913	44
2013-14	5102	766	4311	983	48
2014-15	5466	821	4619	1054	51
2015-16	5830	876	4927	1124	54
2016-17	6195	930	5235	1194	58
2017-18	6559	985	5543	1264	61
2018-19	6924	1040	5850	1335	65
2019-20	7288	1094	6158	1405	68

b) Projections for Fisheries Development and Extension Agencies (Low Growth)

Year	Certificate/ Informally trained	Diploma	UG	PG	PhD
2009-10	3645	547	3079	702	34
2010-11	3736	561	3156	720	27
2011-12	3827	575	3233	738	28
2012-13	3918	588	3310	755	28
2013-14	4009	602	3387	773	29
2014-15	4100	616	3464	790	30
2015-16	4192	629	3541	808	30
2016-17	4283	643	3618	825	31
2017-18	4374	657	3695	843	32
2018-19	4465	670	3772	860	32
2019-20	4556	684	3849	878	33

Annexure-9.14

SAU's Scientists and Faculty in Fisheries Science Education as on March 2010

Sl. No	University	Sanctioned	In Position	Vacant
1	UAS,Banglore	13	9	4
2	JAU,Junagadh	28	16	12
3	UAS,Raichur	5	3	2
4	KAFSU,Bidar	100	38	62
5	WBUAFS, Kolkata	32	18	14
6	SKDAU,Dantiwada	11	5	6
7	CAU, Imphal	33	21	12
8	UAS, Dharwad	6	2	4
9	GADVASU,Ludiana	9	4	5
10	BSKKV,Dapoli	57	54	3
11	OUAT,Bhubaneshwar	16	13	3
12	KAU, Trissur	33	22	11
13	MAFSU,Nagpur	54	18	36
14	TANVASU,Chennai	63	54	9
15	MPUAT,Udaipur	7	5	2
16	SVVU,Tirupathi	29	17	12
17	RAU,Pusa	15	10	5
19	SEKUAS&T, Srinagar	52	32	20
Sub-total for available 19 universities		563	341	222
Estimate for all 23 universities		682	413	269

ICAR's Scientists in Fisheries Science Institutes as on March 2010

SNo	Name of the Institute	Overall Scientists in position		Per Cent Filled
		Sanctioned	In position	
1.	CIFRI, Barrackpore	95	51	53.68
2.	CIFE, Mumbai	104	71	68.26
3.	CIFA, Bhubneswar	78	57	73.07
4.	CMFRI, Cochin	173	107	61.84
5.	CIBA, Chennai	65	48	73.84
6.	NBFGR, Lucknow	40	29	72.5
7.	CIFT, Cochin	95	53	55.78
8.	Directorate of Coldwater Fisheries, Bhimtal	30	15	50
TOTAL		**679**	**431**	

Source : Project data

Annexure-9.15

a. Projections of Stock of Fisheries Human Resources up to 2020 (High Growth)

Year	Certificate/	Diploma	UG	PG	PhD
2009-10	133536	132186	10567	2320	984
2010-11	143966	142009	11803	2571	1032
2011-12	154998	152460	12952	2805	1080
2012-13	166880	163715	14177	3053	1127
2013-14	179581	175753	15459	3312	1177
2014-15	193228	188690	16819	3584	1228
2015-16	207895	202591	18263	3871	1281
2016-17	223627	217503	19790	4172	1336
2017-18	240538	233530	21308	4491	1393
2018-19	258687	250732	23133	4827	1454
2019-20	278202	269223	24961	5183	1517

b. Projections of Stock of Fisheries Human Resources up to 2020 (Low Growth)

Year	Certificate/	Diploma	UG	PG	PhD
2009-10	133536	132186	10567	2320	984
2010-11	141481	139990	11294	2468	1015
2011-12	149826	148195	12046	2620	1056
2012-13	158692	156900	12845	2781	1097
2013-14	168012	166057	13674	2947	1140
2014-15	177876	175745	14546	3121	1183
2015-16	188316	185991	15466	3304	1228
2016-17	199330	196803	16427	3493	1273
2017-18	210984	208238	17336	3692	1320
2018-19	223283	220306	18500	3900	1368
2019-20	236298	233069	19615	4118	1419

c. Projections of Stock of Fisheries Human Resources up to 2020 (Average Growth)

Year	Certificate/	Diploma	UG	PG	PhD
2009-10	133536	132186	10567	2320	984
2010-11	142724	140999	11549	2519	1024
2011-12	152412	150327	12499	2713	1068
2012-13	162786	160307	13511	2917	1112
2013-14	173797	170905	14566	3130	1159
2014-15	185552	182217	15683	3352	1205
2015-16	198106	194291	16865	3587	1254
2016-17	211478	207153	18108	3833	1305
2017-18	225761	220884	19322	4092	1357
2018-19	240985	235519	20816	4363	1411
2019-20	257250	251146	22288	4651	1468

Annexure-9.16

a. Projections of Stock of Fisheries Human Resources in Marine Sector (High Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2009-10	7328	4702	5113	1078	449	6639
2010-11	8306	5307	5888	1227	478	7593
2011-12	9232	5896	6574	1361	505	8439
2012-13	10207	6515	7306	1502	532	9341
2013-14	11233	7164	8089	1653	562	10304
2014-15	12315	7847	8927	1813	593	11333
2015-16	13459	8567	9823	1984	626	12433
2016-17	14667	9326	10782	2166	661	13609
2017-18	15946	10127	11809	2361	697	14866
2018-19	17302	10974	12913	2568	736	16217
2019-20	18739	11870	14095	2790	778	17663

b. Projections of Stock of Fisheries Human Resources in Marine Sector (Low Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2009-10	7328	4702	5113	1078	449	6639
2010-11	7991	5183	5567	1165	467	7200
2011-12	8679	5679	6047	1257	490	7794
2012-13	9396	6192	6552	1353	513	8419
2013-14	10140	6723	7085	1455	538	9077
2014-15	10915	7272	7646	1561	563	9770
2015-16	11722	7842	8239	1673	589	10500
2016-17	12564	8432	8863	1790	615	11269
2017-18	13441	9045	9519	1914	644	12077
2018-19	14355	9681	10215	2044	673	12932
2019-20	15310	10342	10947	2181	704	13832

c.Projections of Stock of Fisheries Human Resources in Marine Sector (Average Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2009-10	6015	4907	3095	763	3544	7402
2010-11	6744	5437	3527	847	3839	8212
2011-12	7455	5971	3915	925	4149	8990
2012-13	8199	6534	4330	1008	4476	9813
2013-14	8978	7124	4772	1095	4820	10687
2014-15	9794	7747	5244	1188	5181	11613
2015-16	10650	8403	5748	1286	5563	12597
2016-17	11550	9094	6286	1391	5965	13642
2017-18	12496	9823	6861	1502	6387	14751
2018-19	13491	10595	7479	1621	6834	15933
2019-20	14540	11408	8138	1747	7305	17190

Annexure-9.17

a. **Projections of Stock of Fisheries Human Resources in Aqua Sector (High Growth)**

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	126208	127484	5454	1242	535	7232
2010-11	135660	136702	5915	1343	555	7813
2011-12	145766	146564	6379	1445	575	8398
2012-13	156674	157200	6870	1551	594	9016
2013-14	168348	168589	7370	1659	615	9644
2014-15	180913	180843	7893	1771	635	10298
2015-16	194437	194023	8440	1887	655	10982
2016-17	208960	208177	9007	2006	676	11689
2017-18	224591	223403	9500	2131	696	12326
2018-19	241386	239758	10220	2259	718	13196
2019-20	259463	257353	10867	2393	740	13999

b. **Projections of Stock of Fisheries Human Resources in Aqua Sector (Low Growth)**

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	126208	127484	5454	1242	535	7232
2010-11	133490	134807	5726	1303	548	7577
2011-12	141147	142516	5999	1364	566	7929
2012-13	149296	150707	6293	1428	584	8305
2013-14	157872	159334	6589	1493	602	8684
2014-15	166961	168473	6900	1560	620	9081
2015-16	176593	178149	7227	1631	639	9497
2016-17	186766	188370	7564	1703	658	9925
2017-18	197544	199193	7817	1778	677	10271
2018-19	208928	210625	8285	1855	696	10836
2019-20	220988	222728	8668	1936	716	11320

c. **Projections of Stock of Fisheries Human Resources in Aqua Sector (Average Growth)**

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	126846	66469	3348	889	3884	8121
2010-11	135234	71214	3609	946	4066	8621
2011-12	144141	76282	3871	1006	4252	9128
2012-13	153691	81747	4149	1068	4450	9666
2013-14	163841	87589	4431	1131	4649	10211
2014-15	174693	93871	4726	1196	4858	10779
2015-16	186293	100625	5036	1263	5076	11375
2016-17	198665	107871	5355	1332	5300	11987
2017-18	211892	115610	5639	1404	5484	12526
2018-19	226005	124022	6038	1477	5777	13292
2019-20	241095	133011	6401	1554	6030	13986

Annexure-9.18

a. Annual Requirement of Fisheries Human Resources in Marine Sector (High Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2010-11	1198	746	929	182	42	1153
2011-12	1175	748	862	170	41	1074
2012-13	1252	796	930	182	43	1155
2013-14	1332	845	1002	196	46	1244
2014-15	1419	898	1080	210	48	1338
2015-16	1513	955	1164	225	51	1440
2016-17	1612	1016	1254	242	53	1549
2017-18	1719	1081	1350	259	56	1666
2018-19	1833	1150	1458	278	60	1797
2019-20	1956	1225	1569	299	64	1932

b. Annual Requirement of Fisheries Human Resources in Marine Sector (Low Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2010-11	883	622	608	120	32	760
2011-12	928	651	646	127	37	810
2012-13	977	684	687	134	38	859
2013-14	1026	716	729	142	40	911
2014-15	1079	751	774	150	41	965
2015-16	1135	788	822	159	43	1023
2016-17	1193	826	871	168	44	1084
2017-18	1254	866	922	177	47	1146
2018-19	1318	907	982	188	48	1218
2019-20	1386	951	1038	198	51	1288

c. Annual Requirement of Fisheries Human Resources in Marine Sector (Average Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2010-11	1040	684	769	151	37	956
2011-12	1051	700	754	148	39	942
2012-13	1114	740	808	158	40	1007
2013-14	1179	781	866	169	43	1077
2014-15	1249	825	927	180	44	1151
2015-16	1324	872	993	192	47	1232
2016-17	1403	921	1063	205	49	1317
2017-18	1487	973	1136	218	51	1406
2018-19	1576	1029	1220	233	54	1507
2019-20	1671	1088	1304	249	57	1610

Annexure-9.19

a. Annual Requirement of Fisheries Human Resources in Aqua Sector (High Growth)

Year	Certificate/ Informally trained	Diploma	UG	PG	PhD	UG & above
2010-11	13239	13042	625	138	35	798
2011-12	14176	13963	641	142	37	819
2012-13	15280	15033	683	150	37	869
2013-14	16375	16105	706	154	38	899
2014-15	17615	17311	744	161	38	943
2015-16	18951	18606	784	169	39	993
2016-17	20356	19974	820	176	40	1036
2017-18	21900	21471	763	185	41	988
2018-19	23532	23057	1005	192	42	1240
2019-20	25319	24788	953	202	43	1199

b. Annual Requirement of Fisheries Human Resources in Aqua Sector (Low Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2010-11	11068	11148	436	98	29	562
2011-12	11662	11753	444	100	35	579
2012-13	12384	12467	474	105	35	614
2013-14	13055	13148	484	108	36	628
2014-15	13825	13918	509	112	36	657
2015-16	14641	14731	534	117	37	689
2016-17	15471	15565	554	121	38	712
2017-18	16380	16474	479	126	39	644
2018-19	17311	17407	703	131	39	873
2019-20	18328	18422	631	137	41	809

c. Annual Requirement of Fisheries Human Resources in Aqua Sector (Average Growth)

Year	Certificate/ Informally	Diploma	UG	PG	PhD	UG & above
2010-11	12153	12095	530	118	32	680
2011-12	12919	12858	543	121	36	699
2012-13	13832	13750	578	128	36	742
2013-14	14715	14626	595	131	37	763
2014-15	15720	15615	626	137	37	800
2015-16	16796	16669	659	143	38	841
2016-17	17914	17770	687	148	39	874
2017-18	19140	18973	621	156	40	816
2018-19	20421	20232	854	161	41	1056
2019-20	21823	21605	792	169	42	1004

Annexure-9.20

Average Annual Requirement of Fisheries Human Resources in Both Marine and Aqua Sectors

Year	Certificate/ Informally trained	Diploma	UG	PG	PhD	UG & above
2010-11	13194	12779	1299	269	69	1637
2011-12	13970	13558	1297	269	75	1641
2012-13	14946	14490	1387	286	76	1749
2013-14	15894	15407	1461	300	80	1841
2014-15	16969	16440	1553	317	82	1952
2015-16	18120	17540	1652	335	85	2073
2016-17	19316	18691	1750	353	88	2191
2017-18	20627	19946	1757	374	91	2222
2018-19	21997	21261	2074	394	95	2564
2019-20	23494	22693	2096	418	100	2614

Annexures for Chapter - 10

Annexure-10.1

Colleges of Dairy Science & Technology in India

State	University	College/faculty
Andhra Pradesh	SVVU, Tirupati, A.P	1. College of Dairy Technology, Kamareddy, Nizambad Dist, 2. College of Dairy Technology, Tirupati
Bihar	Rajendra Agricultural University, Pusa Samastipura	3. Sanjay Gandhi Institute of Dairy Technology (RAU-P), Jagadeo Path, Patna
Chhattis-garh	Indira Gandhi Krishi Viswavidyalay, Raipur	4. College of Dairy Technology, Krishak Nagar, Raipur
Gujarat*	Anand Agricultural University (AAU), Anand	5. Sheth M.C. College of Dairy Science, Anand, Gujarat
	Sardarkrushinagar Dantiwada Agricultural University,SK Nagar	**6.** Shri Galbabhai Nanjibhai Patel Dairy Science and Food Technology College, SK Nagar
	Kamadhenu University**	7. Dairy Science College, Amreli*
	Navasari Agriculture University	8. Dairy Science College, Navasari*
	Junagarh Agriculture University	9. Dairy Science College, Junagarh*
Haryana	NDRI, Karnal	10. Dairy Science College, Karnal
Karnataka	Karnataka Veterinary Animal and Fishery Sciences University (KVAFSU), Bidar, Karnataka	11. College of Dairy Science, Hebbal - Belgaum Dist
Kerala	Kerala Agricultural University (KAU), Kerala.	12. College of Dairy Sciences & Technology, Mannuthy, Thrissur
Maha-rashtra	Maharashtra Animal & Fishery Sciences University, Nagpur	13. College of Dairy Technology (MASFU), Warud (Pusad) 14. College of Dairy Technology (MASFU), Udgir,
Madhya pradesh	Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV) Jabalpur	15. Dairy Science College, Jabalpur
Punjab	Guru Angad Dev Veterinary and Animal Sciences	16. College of Dairy Science and Technology,Ludiana.

	University, Ludhiana	
Rajasthan	Maharana Pratap Agriculture and Technology University, Udaipur	17. College of Dairy & Food Science Technology , Udaipur
Tamil Nadu	Tamil Nadu Veterinary and Animal Sciences University, Chennai	18. PG Department, Chennai
Uttar Pradesh	Allahabad Agricultural university(AAU) Allahabad	19. College and Food and Dairy Technology (AAI), Naini, Allahabad
Uttaranchal	Govind Ballabh Pant Univers of Agriculture and Technolog (GBPAUT), Pantnagar, Uttaranchal	20. PG Department, Pantnagar
West Bengal	West Bengal University of Animal & Fishery Sciences, Kolkata.	21. Faculty of Dairy Technology (WBUAFS), Mohanpur, Kolkata.
	IIT, Kharagpur	22. Dept of Agriculture & Food Engineering

***** Gujarat government approved establishment of three more dairy science colleges in 2011– one each under Kamadhenu University; Navasari Agriculture University and Junagarh Agriculture University.

** Kamadhenu University is new university being established by Gujarat government in 2011 for veterinary, animal and dairy sciences.

Annexure-10.2

Students Admitted and Passed in Dairy Science Courses during 2009-10

Universities	Diploma		UG		PG		PhD	
	Admit	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**
AAU, Allahabad	84	49			18	3	0	0
AAU, Anand			49	49	5	8	3	2
CSUAST, Kanpur			0	0	4	3	0	0
GADVASU, Ludhiana			26	NA	0	0	0	0
GBPUAT, Panthnagar			0	0	1	NA	0	0
IGKV, Raipur			42	25	1	3	0	0
KAU, Trissur			23	18	0	0	0	0
KVAFSU,Bidar			37	20	7	7	3	NA
MAFSU, Nagpur	31	12	64	39	0	0	0	0
MPUAT, Udaipur			53	53	0	0	0	0
NDRI, Karnal			47	NA	128	NA	83	21
RAU, Pusa			25	10	0	0	0	0
SKDAU,Dantiwada			45	NA	0	0	0	0
SVVU, Tirupathi			46	20	0	0	0	0
TANVASU, Chennai			0	0	4	2	1	2
UAS, Dharwad	6	6						
WBUAFS, Belgachia	10	0	30	21	6	4	0	0
Grand Total	**131**	**67**	**487**	**255**	**174**	**30**	**90**	**25**

Annexure-10.3

Trends in Milk Production in Different States

Quantities in '000 tonnes

State	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Growth rate 1998-99 to 2007-08
Andhra Pradesh	4842	5122	5521	5814	6584	6959	7257	7624	7939	8925	6.8
Arunachal Pradesh	45	46	42	42	46	46	48	48	49	50	1.5
Assam	725	667	683	682	705	727	739	747	751	752	1.1
Bihar	3440	3454	2489	2664	2869	3180	4743	5060	5450	5783	8.4
Goa	41	44	45	45	46	48	57	56	57	58	4.2
Gujarat	5059	5269	5312	5862	6089	6421	6745	6960	7533	7911	5.2
Haryana	4527	4679	4850	4978	5124	5221	5222	5299	5367	5442	2.0
Himachal Pradesh	724	742	761	756	773	786	870	869	872	874	2.4
J & K	1232	1286	1321	1360	1389	1414	1422	1400	1400	1498	1.7
Karnataka	4231	4471	4599	4797	4539	3857	3917	4022	4124	4244	-1.2
Kerala	2420	2532	2605	2718	2419	2111	2025	2063	2119	2253	-2.4
Madhya Pradesh	5442	5519	4761	5283	5343	5388	5506	6283	6375	6572	2.6
Maharashtra	5609	5707	5849	6094	6238	6379	6567	6769	6978	7210	2.9
Manipur	65	68	66	68	69	71	75	77	77	78	2.2
Meghalaya	61	62	64	66	68	69	71	73	75	77	2.7
Mizoram	20	18	14	14	15	15	16	15	16	17	-0.9
Nagaland	48	48	51	57	58	63	69	74	67	45	2.6
Orissa	733	850	876	929	941	997	1283	1342	1431	1625	8.8
Punjab	7394	7706	7777	7932	8173	8391	8554	8909	9168	9282	2.6
Rajasthan	6923	7280	7455	7758	7789	8054	8310	8713	9375	9536	3.5
All India	**75424**	**78286**	**80607**	**84406**	**86159**	**88082**	**92484**	**97066**	**69223**	**104840**	**3.7**

Source: Dairy Statistics, 2008

Annexure-10.4

Number of Diary Plants Registered Under Mission Mode Projects (MMPO) Act, 1992

Year	No. of dairy plants				Installed capacity (`000 litres per day)			
	Cooperative sector	Private sector	Others	Total	Cooperative sector	Private sector	Others	Total
1996	180	213	35	428	23392 (130)	19116 (90)	5575 (159)	48083 (112)
2004	232	468	48	748	32898 *(142)*	36774 *(79)*	11706 *(244)*	81378 *(109)*
2005	232	472	47	751	32898 *(142)*	39544 *(84)*	11706 *(249)*	84148 *(112)*
2006	246	493	50	789	36569.5 *(149)*	46085.3 *(93)*	15396 *(308)*	98051 *(124)*
2007	254	532	46	832	37335 *(147)*	49446 *(93)*	10221 *(222)*	97003 *(117)*

Source: Dairy Statistics for various years
Figures in brackets are the average processing capacities of the plants

Annexure-10.5

Projections of Milk Processed, No. of Dairy Plants up to 2020 Under 5% Growth alternative

Year	Milk Production In Million Tonnes (Annual) with 5% growth	% Processed	Quantity of milk processed Mill. Ton. (Annual)	Quantity in thousand Litres per day	Ave.Processing Capacity Thousand Litres per day	Capacity Utilisation %	No. of Plants
2009-10	116	23.19	26.79	73399	124.62	0.64	926
2010-11	121	24.75	30.02	82255	127.15	0.67	963
2011-12	127	26.31	33.51	91814	129.69	0.71	1000
2012-13	134	27.87	37.27	102123	132.23	0.74	1038
2013-14	140	29.43	41.33	113233	134.77	0.78	1077
2014-15	147	30.99	45.70	125199	137.31	0.82	1117
2015-16	155	32.55	50.40	138079	139.85	0.85	1158
2016-17	163	34.11	55.46	151933	142.38	0.89	1200
2017-18	171	35.67	60.89	166828	144.92	0.90	1279
2018-19	179	37.23	66.73	182832	147.46	0.90	1378
2019-20	188	38.79	73.01	200020	150.00	0.90	1482

Annexure-10.6

Projections of Number of Dairy Plants and till 2020 under Alternative Milk Production Scenarios

Year	Projected No. of Dairy Plants in Organized		
	4%	5%	6%
2009-10	917	926	935
2010-11	944	963	981
2011-12	971	1000	1028
2012-13	998	1038	1077
2013-14	1026	1077	1128
2014-15	1054	1117	1181
2015-16	1082	1158	1237
2016-17	1112	1200	1294
2017-18	1173	1279	1392
2018-19	1251	1378	1514
2019-20	1333	1482	1644

Annexure-10.7

Projected Stock of Dairy Science Personnel Required for Processing Sector up to 2020

Year	Required Stock of Dairy Science Personnel at			
	4% growth	5% growth	6% growth	Average of the first two
2009-10	23515	23750	23968	23633
2010-11	24400	24881	25348	24640
2011-12	25281	26027	26768	25654
2012-13	26163	27194	28235	26679
2013-14	27049	28385	29752	27717
2014-15	27942	29604	31325	28773
2015-16	28845	30855	32960	29850
2016-17	29761	32140	34660	30951
2017-18	30691	33464	36430	32077
2018-19	31997	35223	38711	33610
2019-20	33328	37041	41096	35184

Annexure-10.8

a. Required Stock of Dairy Personnel for Processing Plants (@5% growth)

Year	Certificate	Diploma	UG	PG	PhD	UG &above
2009-10	4233	4708	13253	963	593	14809
2010-11	4435	4932	13884	1008	622	15514
2011-12	4639	5159	14524	1055	650	16229
2012-13	4847	5390	15175	1102	679	16957
2013-14	5059	5627	15840	1151	709	17699
2014-15	5277	5868	16520	1200	740	18460
2015-16	5499	6116	17218	1251	771	19239
2016-17	5729	6371	17935	1303	803	20041
2017-18	5964	6633	18673	1356	836	20866
2018-19	6278	6982	19655	1428	880	21963
2019-20	6602	7342	20670	1501	926	23096

b.Required Stock of Dairy Personnel for Processing Plants (@6% growth)

Year	Certificate	Diploma	UG	PG	PhD	UG &above
2009-10	4233	4708	13253	963	593	14809
2010-11	4495	4999	14072	1022	630	15724
2011-12	4746	5279	14860	1079	665	16605
2012-13	5006	5568	15674	1139	702	17515
2013-14	5276	5867	16517	1200	740	18456
2014-15	5555	6177	17390	1263	779	19432
2015-16	5844	6500	18298	1329	819	20446
2016-17	6146	6835	19241	1398	862	21501
2017-18	6460	7184	20224	1469	906	22599
2018-19	6864	7634	21491	1561	962	24014
2019-20	7287	8104	22815	1657	1022	25493

Annexure-10.9

Required Stock of Dairy Personnel for Milk Procurement by Level of Education

Year	No. of villages with bulk chilling plants and testing equipment	No. of diploma/ certificate holders needed of chilling/ testing	No. of quality testing labs.	Personnel required in the labs.		Overall requirements		
				Degree	Diploma/ certificate	Degree	Diploma/ Certificate	Total
2010-11	10,000	20,000	10	20	40	20	20,040	20,060
2011-12	50,000	1,00,000	20	40	80	40	1,00,080	1,00,120
2012-13	1,00,000	2,00,000	30	60	120	60	2,00,120	2,00,180
2013-14	1,25,000	2,50,000	40	80	160	80	2,50,160	2,50,240
2014-15	1,50,000	3,00,000	50	100	200	100	3,00,200	3,00,300
2015-16	1,75,000	3,50,000	60	120	240	120	3,50,240	3,50,360
2016-17	2,00,000	4,00,000	70	140	280	140	4,00,280	4,00,420
2017-18	2,50,000	5,00,000	80	160	320	160	5,00,320	5,00,480
2018-19	3,00,000	6,00,000	90	180	360	180	6,00,360	6,00,540
2019-20	3,00,000	6,00,000	100	200	400	200	6,00,400	6,00,600

Annexure-10.10

SAU's Scientists and Faculty in Dairy Science Sector as on March 2010

SNo	University	Sanctioned	In position	Vacant
1	UAS,Bengaluru	7	1	6
2	AAU,Anand	71	34	37
3	UAS,Raichur	17	5	12
4	KAFSU,Bidar	74	22	52
5	WBUAFS,Kolkata	20	14	6
6	SKDAU,Dantiwada	82	49	33
7	UAS, Dharwad	3	2	1
8	GADVASU,Ludiana	15	9	6
9	KAU,Trissur	30	6	24
10	MPUAT,Udaipur	19	8	11
11	SVVU,Thirupathi	25	10	15
12	CCSHAU, Hissar	108	62	46
13	IGKVV,Raipur	60	41	19
14	MAFSU,Nagpur	34	18	16
Sub-total for 14 universities		565	281	284
Estimate for all 18 universities		726	361	365

Source : Project data

b. Projected Stock of Dairy Science Personnel Required for Research and Academic

Year	PG	PhD	PG+PhD
2009-10	280	420	700
2010-11	328	492	820
2011-12	380	570	950
2012-13	432	648	1080
2013-14	484	726	1210
2014-15	536	804	1340
2015-16	588	882	1470
2016-17	640	960	1600
2017-18	692	1038	1730
2018-19	744	1116	1860
2019-20	800	1200	2000

Annexure-10.11

Stock of Dairy Science personnel

A. Projected Stock at Low growth

Year	Diploma	UG	PG	PhD	UG & above
2009-10	4943	14813	1930	1064	17807
2010-11	26221	15544	2033	1169	18747
2011-12	110501	16284	2142	1281	19707
2012-13	215786	17036	2251	1394	20681
2013-14	268576	17802	2362	1507	21671
2014-15	321372	18585	2474	1621	22680
2015-16	374174	19386	2587	1736	23708
2016-17	426984	20207	2701	1851	24760
2017-18	532301	21051	2818	1968	25836
2018-19	637709	22150	2952	2096	27198
2019-20	638129	23331	3099	2232	28661

B. Projected Stock at High Growth

Year	Diploma	UG	PG	PhD	UG &above
2009-10	4943	14813	1930	1064	17807
2010-11	26291	15741	2048	1178	18967
2011-12	110627	16638	2168	1297	20102
2012-13	215972	17561	2290	1417	21268
2013-14	268829	18513	2414	1539	22466
2014-15	321696	19499	2540	1662	23701
2015-16	374577	20520	2669	1786	24975
2016-17	427471	21579	2801	1913	26293
2017-18	532879	22679	2936	2041	27656
2018-19	638394	24077	3092	2182	29352
2019-20	638930	25583	3263	2333	31178

C. Projected Stock of Dairy Science Personnel (Average)

Year	Diploma	UG	PG	PhD	UG &above
2009-10	4943	14813	1930	1064	17807
2010-11	26256	15643	2040	1174	18857
2011-12	110564	16461	2155	1289	19905
2012-13	215879	17298	2271	1406	20974
2013-14	268702	18158	2388	1523	22069
2014-15	321534	19042	2507	1641	23190
2015-16	374375	19953	2628	1761	24342
2016-17	427227	20893	2751	1882	25526
2017-18	532590	21865	2877	2004	26746
2018-19	638051	23114	3022	2139	28275
2019-20	638530	24457	3181	2282	29920

Annexure-10.12

Annual Requirement of Dairy Science Personnel

A. Annual Flow Requirement at Low Growth

Year	Diploma	UG	PG	PhD	UG &above
2010-11	21426	1512	317	137	1966
2011-12	85067	1552	329	147	2028
2012-13	108600	1595	337	151	2083
2013-14	59264	1652	346	155	2152
2014-15	60853	1708	355	159	2221
2015-16	62443	1770	374	163	2308
2016-17	64035	1852	391	168	2411
2017-18	118127	1932	411	172	2515
2018-19	121377	2247	449	187	2883
2019-20	19552	2395	482	199	3076

B. Annual Flow Requirement at High Growth

Year	Diploma	UG	PG	PhD	UG &above
2010-11	21496	1734	340	146	2220
2011-12	85125	1741	351	154	2246
2012-13	108664	1807	361	159	2327
2013-14	59335	1888	373	164	2424
2014-15	60933	1969	384	169	2522
2015-16	62531	2055	408	174	2637
2016-17	64131	2166	428	180	2774
2017-18	118233	2271	449	185	2905
2018-19	121501	2633	492	203	3327
2019-20	19688	2816	523	216	3555

C. Annual Flow Requirement at Average Growth

Year	Diploma	UG	PG	PhD	UG &above
2010-11	21461	1623	328	142	2093
2011-12	85096	1647	340	151	2137
2012-13	108632	1701	349	155	2205
2013-14	59299	1770	359	159	2288
2014-15	60893	1838	370	164	2372
2015-16	62487	1912	391	169	2472
2016-17	64083	2009	409	174	2592
2017-18	118180	2101	430	179	2710
2018-19	121439	2440	470	195	3105
2019-20	19620	2605	503	207	3315

Annexures for Chapter - 11

Annexure-11.1

Agricultural Engineering Collegs In India

State	University	College/faculty
Andhra Pradesh	Acharya N. G. Ranga Agricultural University (ANGRAU), Hyderabad	1. College of Agricultural Engineering Bapatla, Guntur District 2. College of Agricultural Engineering, Madkasira, Anantapur.
Bihar	Rajendra Agricultural University, Pusa Samastipura	3. College of Agricultural Engineering , Pusa, Samastipur
Chhattis-garh	Indira Gandhi Krishi Viswavidyalay, Raipur	4. College of Agricultural Engineering , Krishak Nagar, Raipur
Delhi	IARI,New Delhi	5. PG School
Gujarat	Anand Agricultural University (AAU), Anand	6. College of Agricultural Engineering and Technology, Godhra, Anand.
	Junagadh Agricultural University (JAU), Junagadh Gujarat 362001.	7. College of Agricultural Engineering and Technology Junagadh
Haryana	Ch Charan Singh Haryana Agricultural University (HAU) Hisar, 125004	8. Agricultural Engineering and Technology, Hisar, Haryana
Jammu&k ashmir	Sher-e-Kashmir University of Agricultural Sciences & Tech. (SKUAST-K),	9. Division of Agriculture Engineering, Main Campus, Shalimar (SKUAST-K)
Jarkhand	BAU, Ranchi	10. Faculty of Agricultural Engineering
Karnataka	University of Agricultural Sciences, (UAS-R), Raichur	11. College of Agricultural Engineering (UAS-R), Raichur Dist, Raichur
	University of Agricultural Sciences, (UAS-B), Banglore	12. College of Agricultural Engineering,GKVK
	University of Agricultural Sciences, (UAS-D), Dharwad	13. College of Agricultural engineering, Dharwad
Kerala	Kerala Agricultural University (KAU), Kerala.	14. Kelappaji College of Agricultural Engineering and Technology (KAU), Tavanur .
Madhya pradesh	Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV) Jabalpur	15. College of Agricultural Engineering , Krishinagar, Jabalpur
Maha-rashtra	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth ,(BSKKV**)** Dapoli, 415712	16. College of Agricultural Engineering and Technology, Dapoli,Rarnagiri. 17. Dr. Budhajirao Mulik College of Engineering and Technology (KKV), Mandki-Palvan. Tal-Chiplun, Dist-Ratnagiri.**

	Marathwada Agricultural University, (MAU), Parbhani	18. College of Agri. Engineering & Technology, Parbhani 19. Aditya College of Agricultural Engineering, (MAU), Beed **
	Mahatma Phule Krishi Vidyapeeth, (MPKV), Rahuri 413722, Ahmednagar	20. Dr. Annasaheb Shinde College of Agri. Engineering, District Ahmednagar* 21. Dr Ulhas Patil College of Agricultural Engineering, Jalgaon.** 22. Padmashri Dr D.Y. Pawar College of Agricultural Engineering, (MPKV), Talsande, Tal Hatkanangale, Dist Kolhapur ** 23. Karmveer Kakasaheb Wagh College of Agricultural Engineering, (MPKV), Panchavati, Nasik.**
	Dr Punjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola, Maharashtra.	24. College of Agricultural Engineering and Technology, Akola. 25. College of Agri. Engineering, Jalgaon Jamod, District Buldhana 443 402*
Mizoram	Central Agricultural University, Imphal	26. College of Agricultural Engineering (CAU), Gangtok, Sikkim
Orissa	Orissa University of Agriculture & Technology, Bhubaneswar	27. College of Agricultural Engineering and Technology, Bhubaneswar 28. College of Engineering & Technology, Fisheries, (OUAT), Bhubaneswar– 751003
Punjab	Punjab Agricultural University, (PAU), Ludhiana, Punjab 141004	29. College of Agricultural Engineering , Ferozepur Road, Ludhiana
Rajasthan	Maharana Pratap Agriculture and Technology University, Udaipur	30. College of Agricultural Technology & Engineering , Udaipur
Tamil Nadu	Tamil Nadu Agricultural University (TNAU), Coimbatore, Tamil Nadu 641003	31. College of Agricultural Engineering , Coimbatore,. 32. Agricultural Engineering College and Research Institute (TNAU), Kumulur, Pallapuram , Trichy Dist
Uttar Pradesh	Chandra Shekhar Azad University of Agriculture & Technology (CSAUT) Kanpur, Uttar Pradesh 208002	33. College of Engineering (CSAUAT), Etawah, Uttar Pradesh
	Allahabad Agricultural university(AAU) Allahabad	34. College of Agricultural Engineering & Technology (AAI), Naini, Allahabad
	Narendra Deva University of Agriculture and Technology Kumarganj – *Faizabad*	35. College of Agricultural Engineering, Faizabad
	SVBPUAT,MEERUT	36. Faculty of Agricultural Engineering

Uttaranchal	Govind Ballabh Pant University of Agriculture and Technology (GBPAUT), Pantnagar, Uttaranchal	37. College of Technology**,** Pantnagar, Uttaranchal
West Bengal	Bidhan Chandra Krishi Vishva Vidyalaya (BCKVV) Nadia,West Bengal 741246	38. Faculty of Agriculture Engineering, Mohanpur
	UBKVV, Coochbehar	39. Faculty of Agricultural Engineering
	IIT, Kharragpur***	40. Dept of Agriculture & Food Engineering

* Private colleges affiliated to respective SAUs

** New private affiliated colleges being established in 2011

*** Central Institution

Annexure-11.2

Students Admitted and Passed in Agriculture Engineering Courses during 2009-10

Universities	Diploma		UG		PG		PhD	
	Admit	Pass	Admit	Pass	Admit	Pass	Admit	Pass
AAU, ALLAHABAD	5	0	120	91	60	13	7	2
AAU, ANAND			33	NA	7	NA	0	0
ANGRAU,HYDERABAD			90	34	15	4	0	0
BAU, RANCHI			0	0	6	NA	0	0
BCKV,MOHANPUR			22	23	0	0	0	0
BHU, VARNASI			0	0	30	40	0	0
BSKV, DAPOLI*			67	67	8	4	1	NA
CAU, IMPHAL			36	0	0	0	0	0
CCSHAU, HARYANA			44	26	8	4	0	0
CSUAST, KANPUR			35	54	0	0	0	0
GBPUAT, PANTHNAGAR			56	50	13	14	2	4
IARI, New Delhi			0	0	16	9	16	4
IGKV, RAIPUR			179	NA	8	16	0	0
IIT, KHARAGPUR			96	80	110	80	14	NA
JAU,JUNAGADH	26	0	73	45	11	4	0	0
JNKV, JABALPUR			89	36	17	0	2	NA
KAU, TRISSUR			43	40	2	1	0	0
MAU, PARABHANI*			63	48	19	4	0	0
MPKV, RAHURI*			352	254	20	14	0	0
MPUAT, UDAIPUR			51	41	12	7	5	5
OUAT, BHUBANESWAR			60	55	16	3	0	0
PAU, LUDHIANA			61	49	26	9	3	6
PDKV, AKOLA*			91	58	25	11	0	0
RAU, PUSA			38	33	1	NA	0	0
SKUAST, Kashmir			14	NA	0	0	0	0
SVPUAT, MEERUT			0	0	6	NA	0	0
TNAU, COIMBATORE			98	57	23	11	8	6
UAS, DHARWAD			NA	34	NA	7	0	0
UAS,BANGLORE			87	18	4	4	0	0
UAS,RAICHUR			41	25	12	3	0	0
UBKVV, COOCHBIHAR			15	NA	0	0	0	0
NDUAT,FAIZABAD			NA	NA	0	0	0	0
Grand Total	31	0	1954	1218	475	262	58	27

*Data of affiliated colleges under MAU, PDKV, MPKV and BSKKV is included in respective universities data

Annexure-11.3

Agricultural Engineering Manpower in Some State Governments 2009-10

Sl.No.	State	Total number in position	Total districts	Average number in position per district
1.	Tamil Nadu (Agricultural Engineering Department, Government of Tamil Nadu)	184	32	6.1
2.	Madhya Pradesh (Soil Conservation in Department of Farmer Welfare &Agriculture Development, Government of Madhya Pradesh)	171	50	3.4
3.	Jammu (Soil Conservation in Department of Agriculture, Jammu)	56	10	5.6

Annexure-11.4

a) Requirements of Agriculture Engineering Manpower in State Government (Low Growth)

Year	Certificate	Diploma	UG	PG	PhD
2009-10	154	305	1755	534	154
2010-11	156	309	1781	542	156
2011-12	158	314	1807	550	158
2012-13	161	318	1833	558	161
2013-14	163	323	1859	565	163
2014-15	165	327	1885	573	165
2015-16	167	332	1911	581	167
2016-17	170	336	1937	589	170
2017-18	172	341	1963	597	172
2018-19	174	345	1989	605	174
2019-20	177	350	2015	613	177

b) Requirements of Agriculture Engineering Manpower in State Government (High Growth)

Year	Certificate	Diploma	UG	PG	PhD
2009-10	154	305	1755	534	154
2010-11	161	318	1833	558	161
2011-12	165	327	1885	573	165
2012-13	170	336	1937	589	170
2013-14	174	345	1989	605	174
2014-15	179	354	2041	621	179
2015-16	183	363	2093	637	183
2016-17	188	372	2145	652	188
2017-18	192	381	2197	668	192
2018-19	197	390	2249	684	197
2019-20	202	399	2301	700	202

Annexure-11.5

Projected Stock Requirement of Agricultural Engineering Manpower in Agricultural and Food Machinery Manufacturing Industries

a) **LOW GROWTH (3% Growth rate)**

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	771	1533	8840	2690	771	12301
2010-11	794	1579	9105	2770	794	12669
2011-12	818	1627	9378	2853	818	13049
2012-13	842	1676	9659	2939	842	13441
2013-14	868	1726	9949	3027	868	13844
2014-15	894	1778	10248	3118	894	14259
2015-16	920	1831	10555	3212	920	14687
2016-17	948	1886	10872	3308	948	15128
2017-18	977	1942	11198	3407	977	15582
2018-19	1006	2001	11534	3509	1006	16049
2019-20	1036	2061	11880	3615	1036	16530

b) HIGH GROWTH (8% Growth rate)

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	771	1533	8840	2690	771	12301
2010-11	833	1656	9547	2905	833	13285
2011-12	899	1788	10311	3138	899	14348
2012-13	971	1931	11136	3389	971	15496
2013-14	1049	2086	12027	3660	1049	16735
2014-15	1133	2252	12989	3952	1133	18074
2015-16	1223	2433	14028	4269	1223	19520
2016-17	1321	2627	15150	4610	1321	21082
2017-18	1427	2837	16362	4979	1427	22768
2018-19	1541	3064	17671	5377	1541	24590
2019-20	1665	3310	19085	5808	1665	26557

Annexure-11.6

Faculty in Agricultural Engineering Education, 2009-10

Sl No	University	Sanctioned	In position	Vacant
1	UAS,Banglore	39	14	25
2	JAU,Junagadh	51	33	18
3	UAS,Raichur	62	23	39
4	ANGRAU,Hyderabad	19	8	11
5	BCKV,Mohanpur	16	13	3
6	UBKV,Coochbehar	23	3	20
7	TNAU,Coiambatore	82	69	13
8	UAS, Dharwad	26	13	13
9	BSKKV,Dapoli	36	32	4
10	CSUAST,Kanpur	24	14	10
11	OUAT,Bhubaneshwar	17	15	2
12	KAU,Kerala	51	34	17
13	JNKVV,Jabalpur	52	26	26
14	MPUAT,Udaipur	34	13	21
15	CCSHAU, Hissar	37	18	19
16	IGKVV,Raipur	15	8	7
17	GBPUAT, Panthnagar	149	80	69
18	PAU, Ludhiana	147	75	72
19	AAU, Allahabad	39	35	4
20	RAU, Pusa	21	10	11
21	AAU, Anand	39	18	21
22	IIT, Kharahgpur	NA	38	NA
23	Affiliated colleges of MAU	NA	20	
24	Affiliated colleges of MPKV	NA	19	
Estimate for all colleges		1200	700	500

Annexure -11.7

Requirements of Agriculture Engineering Manpower in Teaching

Year	PG	PhD	Total
2009-10*	131	523	654
2010-11	134	535	668
2011-12	136	546	682
2012-13	139	557	697
2013-14	142	569	711
2014-15	145	580	725
2015-16	148	591	739
2016-17	151	603	753
2017-18	154	614	768
2018-19	156	625	782
2019-20	159	637	796
PG/PhD Ratio	0.2	0.8	

Annexure-11.8

Requirements of Agriculture Engineering Manpower in Research*

Year	PG	PhD	Total
2009-10	100	400	500
2010-11	101	404	505
2011-12	102	408	510
2012-13	103	412	515
2013-14	104	416	520
2014-15	105	420	526
2015-16	106	425	531
2016-17	107	429	536
2017-18	108	433	541
2018-19	109	437	547
2019-20	110	442	552
PG/PhD Ratio	0.2	0.8	

* Includes 365 in ICAR and 135 in other institutions

Annexure-11.9

a: Overall Stock Projections for Agri-engineering Human Resources (Low Growth)

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	1017	2022	11654	3801	2033	17488
2010-11	1045	2077	11975	3901	2077	17953
2011-12	1074	2134	12304	4006	2123	18432
2012-13	1103	2193	12642	4113	2170	18924
2013-14	1134	2253	12989	4223	2217	19429
2014-15	1165	2315	13346	4336	2265	19947
2015-16	1197	2379	13713	4451	2314	20479
2016-17	1230	2444	14090	4570	2364	21025
2017-18	1263	2511	14477	4693	2415	21585
2018-19	1298	2580	14875	4818	2467	22161
2019-20	1334	2651	15285	4947	2520	22752

b: Overall Stock Projections for Agri-engineering Human Resources (High Growth)

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	1018	2022	11655	3800	2033	18685
2010-11	1093	2171	12518	4067	2125	18710
2011-12	1171	2327	13416	4344	2220	19980
2012-13	1255	2494	14380	4642	2321	21344
2013-14	1346	2674	15418	4962	2429	22808
2014-15	1443	2867	16533	5306	2543	24382
2015-16	1548	3076	17733	5675	2665	26074
2016-17	1660	3300	19025	6073	2795	27893
2017-18	1782	3541	20416	6500	2933	29849
2018-19	1912	3800	21913	6960	3081	31954
2019-20	2053	4080	23525	7455	3239	34219

c: Overall Stock Projections for Agri-engineering Human Resources (Average Growth)

Year	Certificate	Diploma	UG	PG	PhD	UG & above
2009-10	1017	2022	11654	3800	2033	18086
2010-11	1069	2124	12247	3984	2101	18332
2011-12	1122	2231	12860	4175	2172	19206
2012-13	1179	2344	13511	4377	2245	20134
2013-14	1240	2464	14203	4592	2323	21119
2014-15	1304	2591	14940	4821	2404	22165
2015-16	1372	2727	15723	5063	2490	23276
2016-17	1445	2872	16557	5322	2580	24459
2017-18	1522	3026	17446	5596	2674	25717
2018-19	1605	3190	18394	5889	2774	27057
2019-20	1693	3366	19405	6201	2880	28485

Annexure-11.10

a: Flow Projections for Agri-engineering Human Resources (Low Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	116	1020	332	106	1458
2011-12	119	1047	341	108	1496
2012-13	123	1074	350	110	1534
2013-14	126	1103	358	112	1573
2014-15	130	1132	367	115	1614
2015-16	133	1162	376	117	1656
2016-17	137	1194	385	119	1698
2017-18	141	1225	395	122	1743
2018-19	144	1257	405	124	1787
2019-20	148	1290	415	127	1833

b:Flow Projections for Agri-engineering Human Resources (High Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	210	1840	558	153	2551
2011-12	221	1942	587	159	2687
2012-13	237	2082	626	168	2876
2013-14	255	2233	669	177	3079
2014-15	274	2396	715	187	3298
2015-16	294	2572	765	198	3534
2016-17	316	2761	818	210	3788
2017-18	340	2963	876	222	4061
2018-19	366	3183	937	236	4355
2019-20	394	3428	1002	250	4680

c: Flow Projections for Agri-engineering Human Resources (Average Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	163	1430	445	129	2004
2011-12	170	1494	464	133	2092
2012-13	180	1578	488	139	2205
2013-14	190	1668	514	145	2326
2014-15	202	1764	541	151	2456
2015-16	214	1867	570	158	2595
2016-17	227	1977	602	165	2743
2017-18	240	2094	635	172	2902
2018-19	255	2220	671	180	3071
2019-20	271	2359	709	189	3256

Annexures for Chapter - 12

Annexure-12.1

Details of Various PG Courses in Biotechnology

Post Graduate Courses	Number of Universities Imparting Courses	Intake (2009-10)
M.Sc Agricultural Biotechnology, M.Tech Biotechnology, M.Sc. Marine Biotechnology, M.Sc. Neuro Sciences, M.V.Sc. Animal Biotechnology, M.Sc. Molecular and Human Genetics, M.Sc. Medical Biotechnology, M.Sc. Environmental Biotechnology, M.Sc. Industrial Biotechnology, M.Tech. Pharma Biotechnology, M.Sc. Plant Biotechnology, M.Tech. Marine Biotechnology, M.Sc. General Biotechnology	34	457

Source: Department of Biotechnology, Annual Report, 2006 and ICAR, 2009-10

Annexure-12.2

Students Admitted and Passed in Agri-Biotechnology Courses during 2009-10

Universities	Diploma		UG		PG		PhD	
	Admit	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**	**Admit**	**Pass**
AAU, Allahabad	NA	NA	250	359	0	0	11	4
AAU, Anand	NA	NA	0	0	7	3	0	0
ANGRAU,Hyderabad	NA	NA	0	0	25	22	0	0
BAU, Ranchi	NA	NA	0	0	12	10	0	0
BCKV,Mohanpur	NA	NA	0	0	0	0	2	NA
BHU, Varnasi	NA	NA	0	0	8	6	0	0
CCSHAU, Hissar	NA	NA	0	0	0	12	NA	1
CSKHPKV, Palampur	NA	NA	0	0	6	3	0	0
CSUAST, Kanpur	NA	NA	0	0	5	5	0	0
IARI, New Delhi	NA	NA	0	0	5	3	12	6
IGKV, Raipur	NA	NA	0	0	11	1	2	1
JAU,Junagadh	NA	NA	0	0	10	6	2	NA
JNKV, Jabalpur	NA	NA	0	0	8	3	0	0
MAU, Parabhani	NA	NA	33	20	0	0	0	0
MPKV, Rahuri	NA	NA	96	83	26	22	0	0
MPUAT, Udaipur	NA	NA	0	0	NA	NA	0	0
NDRI, Karnal	NA	NA	0	0	0	0	NA	5
PDKV, Akola	NA	NA	34	62	0	0	0	0
PDKV, Akola (affiliated)	NA	NA			0	0	0	0
RAU, Pusa	NA	NA	25	NA	0	0	0	0
SKDAU,Dantiwada	NA	NA	0	0	NA	NA	0	0
SKRAU, Bikanir	NA	NA	0	0	7	4	0	0
SVPUAT, Meerut	NA	NA	64	NA	21		0	0
TANVASU, Chennai	NA	NA	0	0	8	3	0	0
TNAU, Coimbatore	NA	NA	58	34	21	23	0	0
UAS, Dharwad	NA	NA	0	0	NA	15	1	1
UAS,Bengaluru	NA	NA	32	0	NA	NA	0	0
YSPUHF, Solan	NA	NA	0	0	15	15	5	2
Grand Total			**592**	**558**	**195**	**156**	**35**	**20**

b. Intake/Outturn in Bio-technology Discipline at BTech and above

Year	Intake	Outturn
2001-02	89	68
2002-03	845	74
2003-04	1919	142
2004-05	2163	109
2005-06	1530	277
2006-07	1705	234
2007-08	2413	291
2008-09	2419	331
Projection		
2010-11	2382	455
2011-12	2280	512
2012-13	2172	563
2013-14	2226	622
2014-15	2356	661
2015-16	2346	727
2016-17	2316	777
2017-18	2436	825
2018-19	2619	867
2019-2020	2501	928

Source: For the year 2001-02 to 2008-09 NTMIS

Annexure-12.3

Institutions Employing Bio-tech Researchers

Sl.No	Institute(s)	No of bio-tech. Professionals Deployed
1	DBT Institute	52
2	CSIR	54
3	National Institutes	119
4	General Universities	30
5	Agriculture Universities	19
6	Medical Colleges	16
7	ICMR Institute	10
8	IITs	10
9	DST Institutes	9
10	Others	5
Total		**324**

Source: DBT Annual Report 2008

Annexure-12.4

Projected Growth of Demand for Bio-technologists in Industry

Year	Demand for bio-technologists					
	All bio-technologists @growth of			Agri-biotechnologists @growth of		
	20%	10%	15%	20%	10%	15%
2006-07	6892	6892	6892	1034	1034	1034
2007-08	8270	7581	7926	1241	1137	1189
2008-09	9924	8339	9115	1489	1251	1367
2009-10	11909	9173	10482	1787	1376	1573
2010-11	14291	10091	12054	2144	1514	1808
2011-12	17150	11100	13862	2573	1665	2080
2012-13	20579	12210	15942	3088	1832	2392
2013-14	24695	13431	18333	3705	2015	2750
2014-15	29634	14774	21083	4446	2216	3163
2015-16	35561	16251	24245	5335	2438	3637
2016-17	42673	17876	27882	6402	2682	4183
2017-18	51208	19664	32064	7683	2950	4811
2018-19	61450	21630	36874	9219	3245	5532
2019-20	73740	23793	42405	11063	3570	6362

Source: Base year (2006-07) data taken from survey conducted by Bio-spectrum in 2007

Annexure-12.5

Projected Demand of Biotechnologists for Developmental Programmes

Year	UG	PG	PhD	Total
2009-10	-	10	90	100
2010-11	-	11	99	110
2011-12	-	12	108	120
2012-13	-	13	117	130
2013-14	-	14	126	140
2014-15	-	15	135	150
2015-16	-	16	144	160
2016-17	-	17	153	170
2017-18	-	18	162	180
2018-19	-	19	171	190
2019-20	-	20	180	200

Annexure-12.6

Projected Demand for Biotechnologists for Agri- Biotech Research

Year	UG	PG	PhD	Total
2009-10	-	30	270	300
2010-11	-	32	288	320
2011-12	-	34	306	340
2012-13	-	36	324	360
2013-14	-	38	342	380
2014-15	-	40	360	400
2015-16	-	42	378	420
2016-17	-	44	396	440
2017-18	-	46	414	460
2018-19	-	48	432	480
2019-20	-	50	450	500

Annexure-12.7

DBT Initiatives on Tissue Culture

The DBT, Ministry of Science & Technology, Govt. of India has announced various targets for the tissue culture industry and some of them are:

- Developing complete packages for improvement of priority crops - coffee, tea, apple, spices,
- Continued large scale production of forest tree species,
- Development and use of micro propagation for multiplication of root stocks and scions in selected varieties of fruit crops like mango and hairy root culture for production of secondary metabolites in general and those relevant to food industry,
- Promoting application of tissue culture technology at grass root level and its adoption by the end user,
- Utilization of tissue culture for enrichment of genetic diversity, and
- Genetic manipulation of cell culture in forestry for disease resistance and reduction of regeneration time.

The plants in each category which are commercially propagated are as follows:

SNo	Plant category	Plants
1	Fruits	Banana, Pineapple, Strawberry,
2	Cash crops	Sugarcane, Potato
3	Spices	Turmeric, Ginger, Vanilla, Large cardamom, Small Cardamom
4	Medicinal plants	Aloevera, Geranium, Stevia, Patchouli, Neem
5	Ornamentals	Gerbera, Carnation, Anthurium, Lily, Syngonium, Cymbidium
6	Woody plants	Teak, Bamboo, Eucalyptus, Populus
7	Bio fuel	Jatropha, Pongamia

Source: BCIL & DBT, Govt. Of India, 2008

Plan Expenditure under the DBT in Crop Biotechnology (Rs. in Lakhs)

Scheme	8th Plan 1992-1997	9th Plan 1997-2002	10th plan 2002-2007	11th Plan 2007-2012
Crop Biotechnology	1916	2897	7500	25000
Approximate Share of Horticulture biotechnology	575	870	2250	5500

Source: Working Group on Horticulture, Plantation Crop and Organic Farming, planning Commission, GOI.

Annexure-12.8

Number of Registered TCP units in the Country		
1. A.G. Bioteck Laboratories (India) Ltd., Hyderabad 2. Anantha Biotechnologies, Ananthapur 3. ACE Agro Technologies, Secunderabad 4. Agri Vitro Tech Laboratories, Secunderabad 5. BrookFileds Biotech Pvt. Ltd., Kadapa 6. S & S Agro Biotech Pvt. Ltd., Secunderabad 7. Godrej Agrovet Ltd.(Plant Biotech Division), R.R. District 8. Sai Lara Biotechnologies, Hyderabad 9. Phytica Biotech Pvt. Ltd., Medak District 10. Devleela Biotechs, Raipur 11. Aditya Biotech Lab & Research Pvt Ltd., Raipur 12. Shaili Biotech (P) Ltd., Ahmedabad 13. Cadila Pharmaceuticals Ltd.(Agro Division), Ahmedabad 14. Arcadia Agro, Mogar Anand 15. Sarjan Biotech Pvt. Ltd., Bhuj-Kutch	16. Technico Agri Sciences Ltd., Chandigarh 17. Micropropagation Technology Park (TERI) New Delhi 18. Sheel Biotech Ltd., Gurgaon 19. Shri Ramco Biotech, Bangalore 20. Greenearth Biotechnologies Ltd., Bangalore 21. MSR Biotech Pvt. Ltd., Bangalore 22. K.F. Biotech Pvt Ltd., Bangalore 23. Lakshmi Biotech, Bangalore 24. Labland Biotech Pvt Ltd., Mysore 25. L.J. International Ltd. (AVT), Kochi 26. K.F. Bioplants Pvt. Ltd., Pune 27. Reliance Life Sciences Pvt. Ltd., Mumbai 28. Ajeet Seeds Ltd. Aurangabad 29. Rise N Shine Biotech Pvt. Ltd., Pune 30. Gargi Bioteck Pvt. Ltd., Pune	31. Seema Biotech, Kolhapur 32. H.U Gugle Agro Biotech Co., Ahmadnagar 33. Nirmeeet Biotech, Pune 34. Jain Irrigation Systems Ltd. Jalgaon 35. Growmore Bioteh Ltd., Hosur 36. SPIC Agro Biotech Centre, Coimbatore 37. Tissue Culture Facility, Biotech Park, Lucknow 38. Aryave Biotech Pvt. Ltd., Haridwar 39. Vedic Synergy Biotechnologies Ltd., Durgapur 40. Elegant Flower Company Pvt. Ltd., Kolkata 41. Boinchi Bioplants Pvt. Ltd., Boinchi 42. Vasantdada Sugar Institue, Pune 43. Futura Bioplants Pvt. Ltd., Pune 44. Neesa Agritech Pvt. Ltd. Ahmedabad 45. PepsiCo India Holdings Pvt. Ltd. Hoshiarpur

Source: DBT, Ministry of S & T, Govt. of India

Annexure-12.9

Projected Demand for TCPs and Number of TCP Units

Year	Demand for TCPs (Million Plants)	Number of TCP Units
2003-04	72	28
2007-08	112	45
2019-20 (High)	599	243
2019-20 (Low)	352	156

Source: Planning Commission (2003-04 to 2011-12), and
Projections by IAMR for subsequent years.

Annexure-12.10

a)Projected Demand for Biotechnologists for Tissue Culture (Low Growth)

Year	Diploma	UG	PG	PhD
2009-10	180	30	20	10
2010-11	198	33	22	11
2011-12	218	36	24	12
2012-13	240	40	27	13
2013-14	264	44	29	15
2014-15	290	48	32	16
2015-16	319	53	35	18
2016-17	351	58	39	19
2017-18	386	64	43	21
2018-19	424	71	47	24
2019-20	467	78	52	26

b. Projected Demand for Biotechnologists for Tissue Culture (High Growth)

c.

Year	Diploma	UG	PG	PhD
2009-10	180	30	20	10
2010-11	207	35	23	12
2011-12	238	40	26	13
2012-13	274	46	30	15
2013-14	315	52	35	17
2014-15	362	60	40	20
2015-16	416	69	46	23
2016-17	479	80	53	27
2017-18	551	92	61	31
2018-19	633	106	70	35
2019-20	728	121	81	40

Annexure-12.11

Projected Demand for Biotechnologists for Seed Sector (Low Growth)

Year	Diploma	UG	PG	PhD
2009-10	175	790	560	275
2010-11	184	830	588	288
2011-12	193	871	617	303
2012-13	203	915	648	318
2013-14	213	960	681	334
2014-15	223	1008	715	350
2015-16	235	1059	750	368
2016-17	246	1112	788	386
2017-18	259	1167	827	406
2018-19	271	1226	869	426
2019-20	285	1287	912	447

Projected Demand for Biotechnologists for Seed Sector (High Growth)

Year	Diploma	UG	PG	PhD
2009-10	175	790	560	275
2010-11	193	869	616	302
2011-12	212	956	678	332
2012-13	233	1051	745	365
2013-14	256	1157	820	402
2014-15	282	1272	902	442
2015-16	310	1400	992	486
2016-17	341	1539	1091	535
2017-18	375	1693	1200	588
2018-19	413	1863	1320	647
2019-20	454	2049	1452	712

Annexure-12.12

a.Projected Demand for Biotechnologists for Veterinary Pharma Sector (Low Growth)

Year	Diploma	UG	PG	PhD	Total
2009-10	-	225	150	75	450
2010-11	-	236	158	79	473
2011-12	-	248	165	83	496
2012-13	-	260	174	87	521
2013-14	-	273	182	91	547
2014-15	-	287	191	96	574
2015-16	-	302	201	101	603
2016-17	-	317	211	106	633
2017-18	-	332	222	111	665
2018-19	-	349	233	116	698
2019-20	-	367	244	122	733

b.Projected Demand for Biotechnologists for Veterinary Pharma Sector (High Growth)

Year	Diploma	UG	PG	PhD	Total
2009-10	-	225	150	75	450
2010-11	-	248	165	83	495
2011-12	-	272	182	91	545
2012-13	-	299	200	100	599
2013-14	-	329	220	110	659
2014-15	-	362	242	121	725
2015-16	-	399	266	133	797
2016-17	-	438	292	146	877
2017-18	-	482	322	161	965
2018-19	-	531	354	177	1061
2019-20	-	584	389	195	1167

Annexure-12.13

a) Overall Projections of Requirements Stocks of Biotechnologists (High Growth)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	391	1150	887	951	2988
2010-11	439	1266	975	1036	3278
2011-12	495	1395	1073	1127	3594
2012-13	557	1536	1179	1223	3939
2013-14	628	1692	1296	1326	4315
2014-15	708	1865	1425	1437	4726
2015-16	799	2054	1567	1555	5176
2016-17	902	2264	1723	1682	5669
2017-18	1018	2494	1894	1820	6208
2018-19	1150	2749	2082	1968	6799
2019-20	1300	3029	2290	2128	7447

b) Overall Projections of Requirements Stocks of Biotechnologists (Low Growth)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	391	1150	887	951	2988
2010-11	420	1209	933	1009	3151
2011-12	452	1271	982	1067	3320
2012-13	486	1336	1033	1127	3497
2013-14	524	1405	1086	1189	3681
2014-15	565	1478	1143	1252	3873
2015-16	609	1555	1201	1317	4073
2016-17	657	1635	1263	1384	4283
2017-18	709	1720	1328	1453	4501
2018-19	766	1810	1397	1523	4730
2019-20	827	1904	1468	1596	4969

c) Overall Projections of Requirements Stocks of Biotechnologists (Average Growth)

Year	Diploma	UG	PG	PhD	UG & above
2009-10	391	1150	887	951	2988
2010-11	430	1237	954	1022	3214
2011-12	473	1333	1027	1097	3457
2012-13	522	1436	1106	1175	3718
2013-14	576	1549	1191	1258	3998
2014-15	636	1671	1284	1344	4300
2015-16	704	1804	1384	1436	4625
2016-17	779	1949	1493	1533	4976
2017-18	864	2107	1611	1636	5355
2018-19	958	2279	1740	1746	5764
2019-20	1064	2467	1879	1862	6208

Annexure-12.14

a) Projected Outturns of Required Biotechnologists (High Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	53	378	213	94	685
2011-12	60	413	231	101	744
2012-13	68	451	250	108	809
2013-14	76	494	272	115	881
2014-15	86	540	296	124	960
2015-16	98	604	322	133	1059
2016-17	111	660	351	143	1154
2017-18	126	721	396	154	1270
2018-19	142	790	430	166	1386
2019-20	161	865	467	180	1512

b) Projected Outturns of Required Biotechnologists (Low Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	33	209	128	67	404
2011-12	36	218	133	69	420
2012-13	39	228	138	71	437
2013-14	42	238	144	73	455
2014-15	46	249	150	75	473
2015-16	50	257	156	78	490
2016-17	54	268	162	80	510
2017-18	59	280	165	83	528
2018-19	64	293	172	85	550
2019-20	69	299	179	88	566

b) Projected Outturns of Required Biotechnologists (Average Growth)

Year	Diploma	UG	PG	PhD	UG & above
2010-11	43	294	170	81	545
2011-12	48	316	182	85	582
2012-13	53	340	194	89	623
2013-14	59	366	208	94	668
2014-15	66	394	223	99	716
2015-16	74	430	239	105	774
2016-17	82	464	256	111	832
2017-18	92	501	281	118	899
2018-19	103	541	301	126	968
2019-20	115	582	323	134	1039

Annexures for Chapter - 13

A. Individual Survey

A1.Coverage of Individual Experts by Type of Organization and Major Disciplines

Discipline	Respondents from				
	University /Colleges	ICAR Institutions	Government Departments	Other Organizations	Total
1. Agriculture	1009(39.2)	177 (6.9)	758 (29.5)	627 (24.4)	2571 (52.7)
2. Agriculture Engineering	111 (72.1)	11 (7.1)	11 (7.1)	21(13.6)	154 (3.2)
3. Bio-Chemistry	63 (29.9)	26 (12.3)	27 (12.8)	95 (45.0)	211 (4.3)
4. Home Science	128 (95.5)	3 (2.2)	2 (1.5)	1 (0.7)	134 (2.7)
5. Dairy Technology	21 (45.6)	(0.0)	8 (17.4)	17 (36.9)	46 (0.9)
6. Fishery	48 (64.0)	1 (1.3)	13 (17.3)	13 (17.3)	75 (1.5)
7. Forestry	17 (51.5)	4 (12.1)	4 (12.1)	8 (24.2)	33 (0.7)
8. Food Technology	11 (61.1)	(0.0)	2 (11.1)	5 (27.8)	18 (0.4)
9. Veterinary & AH	506 (67.5)	36 (4.8)	124 (16.5)	84 (11.2)	750 (15.4)
10. Horticulture	34 (31.8)	8 (7.5)	38 (35.5)	27 (25.2)	107 (2.2)
11. Others	202 (25.8)	77 (9.8)	148 (18.9)	355 (45.4)	782 (16)
Total	**2150 (44.0)**	**343 (7.0)**	**1135 (23.3)**	**1253 (25.7)**	**4881 (100.0)**

A2: Discipline-wise and Education-wise Distribution of Respondents

Discipline	Educational Level of the Respondents				
	UG	PG	PhD	Others	Total
1. Agriculture	768 (29.9)	579 (22.5)	1121 (43.6)	103 (4.0)	2571 (100.0)
2. Agriculture Engineering	20 (13.0)	16 (10.4)	94 (61.0)	24 (15.6)	154 (100.0)
3. Bio Chemistry	27 (12.8)	39 (18.5)	123 (58.3)	22 (10.4)	211 (100.0)
4. Home Science	3 (2.2)	21 (15.7)	110 (82.1)	0 (0.0)	134 (100.0)
5. Dairy Tech	11 (23.9)	10 (21.7)	18 (39.1)	7 (15.2)	46 (100.0)
6. Fishery	6 (8.0)	35 (46.7)	32 (42.7)	2 (2.7)	75 (100.0)
7. Forestry	1 (3.0)	13 (39.4)	17 (51.5)	2 (6.1)	33 (100.0)
8. Food Tech	9 (50.0)	1 (5.6)	5 (27.8)	3 (16.7)	18 (100.0)
9. Veterinary & AH	57 (7.6)	254 (33.9)	432 (57.6)	7 (0.9)	750 (100.0)
10. Horticulture	40 (37.4)	26 (24.3)	33 (30.8)	8 (7.5)	107 (100.0)
11. Others	167 (21.4)	209 (26.7)	222 (28.4)	184 (23.5)	782 (100.0)
Total	**1109 (22.7)**	**1203 (24.6)**	**2207 (45.2)**	**362 (7.4)**	**4881 (100.0)**

A3: Respondents by Gender & Social Category

Discipline	SC (%)		ST (%)		BC (%)		General		Total	
	All	F	All	F	All	F	All	F	N	F
1. Agriculture	8.8	2.1	3.2	0.7	21.9	4.5	66.1	7.5	2571	14.7
2. Agri.	7.1	1.3	1.9	0.0	11.0	0.6	79.9	3.9	154	5.8
3. Bio Tech	3.3	0.0	4.7	1.9	14.2	4.7	77.7	24.2	211	30.8
4. Home Science	5.2	5.2	0.0	0.0	11.2	9.7	83.6	79.1	134	94.0
5. Dairy	10.	0.0	8.7	0.0	13.0	4.3	67.4	13.0	46	17.4
6. Fishery Science	12.	1.3	4.0	0.0	21.3	2.7	62.7	5.3	75	9.3
7. Forestry	12.	0.0	12.1	0.0	12.1	0.0	63.6	0.0	33	0.0
8. Food Tech	11.	0.0	0.0	0.0	5.6	0.0	83.3	11.1	18	11.1
9. Veterinary	8.7	1.1	1.3	0.3	23.2	3.3	66.8	8.3	750	12.9
10. Horticulture	13.	0.9	2.8	0.9	41.1	8.4	43.0	9.3	107	19.6
11.Others	8.4	2.2	3.3	1.0	26.6	5.0	61.6	11.4	782	19.6
Total	**8.5**	1.8	**3.0**	0.7	**22.1**	4.4	**66.4**	10.8	**4881**	17.7

A5: Time Taken to Get First Employment of Agricultural Students

Discipline	Less than six months	6 to 12 months	More than 1 year*	Total
1.Agriculture	2449 (95.3)	9 (0.4)	113 (4.4)	2571 (52.7)
2. Agriculture Engineering.	152 (98.7)	0	2 (1.3)	154 (3.2)
3. Bio Technology	206 (97.6)	0	5(2.4)	211 (4.3)
4. Home Science	127 (94.8)	0	7 (5.2)	134 (2.7)
5. Dairy Tech/Science	45 (97.8)	0	1 (2.2)	46 (0.9)
6. Fishery	74 (98.7)	0	1 (1.3)	75 (1.5)
7. Forestry	33 (100.0)	0	0	33 (0.7)
8. Food Technology	18 (100.0)	0	0	18 (0.4)
9. Veterinary & AH	735 (98.0)	1 (0.1)	14 (1/9)	750 (15.4)
10. Horticulture	106 (99.1)	0	1 (0.9)	107 (2/2)
11. Others	744 (95.1)	2 (0.3)	36 (4.6)	782 (16/0)
Total	**4689 (96.1)**	**12 (0.2)**	**180 (3.7)**	**4881 (100)**

* includes better job seekers

A6: Reasons for Opting Agriculture as Area of Study

Discipline	Reasons for Opting the Agriculture Course					
	Interest in the Subject	**Best Professional Degree as per your Qualification**	**More Employment opportunities in the Sector**	**Family Pressure**	**No specific reasons***	**Total**
1. Agriculture	999 (38.9)	551 (21.4)	438 (17.0)	220 (8.6)	363 (14.1)	2571 (52.7)
2. Agri. Engineering	67 (43.5)	29 (18.8)	26 (16.9)	13 (8.4)	19 (12.3)	154 (3.2)
3. Bio Technology	150 (71.1)	19 (9.0)	19 (9.0)	3 (1.4)	20 (9.5)	211 (4.3)
4. Home Science	65 (48.5)	25 (18.7)	22 (16.4)	5 (3.7)	17 (12.7)	134 (2.7)
5. Dairy Tech	12 (26.1)	6 (13.0)	18 39.1)	1 (2.2)	9 (19.6)	46 (0.9)
6. Fishery	38 (50.7)	19 (25.3)	11 (14.7)	0	7 (9.3)	75 (1.5)
7. Forestry	20 (60.6)	6 (18.2)	0	3 (9.1)	4 (12.1)	33 (0.7)
8. Food Tech	10 (55.6)	5 (27.8)	1 (5.6)	0	2 (11.1)	18 (0.4)
9. Veterinary & AH	290 (38.7)	172 (22.9)	171 (22.8)	45 (6.0)	72 (9.6)	750 (15.4)
10. Horticulture	47 (43.9)	10 (9.3)	23 (21.5)	11 (10.3)	16 (15.0)	107 (2.2)
11. Other	300 (38.4)	110 (14.1)	130 (16.6)	100 (12.8)	142 (18.2)	782 (16.0)
Total	**1998 (40.9)**	**952 (19.5)**	**859 (17.6)**	**401 (8.2)**	**671 (13.7)**	**4881 (100.0)**

***** includes; no interest need a professional degree, unemployed need a course

A7: Perceptions on Adequacy of Agriculture Education

Discipline	Total respondents	Per cent respondents		
		Fully adequate	Partially adequate	Not adequate
Agriculture	2571	44.0	50.1	6.0
Agri. Engg.	154	39.6	59.1	1.3
Biotechnology.	211	21.3	68.7	10.0
Ani.Vet. Sci.	134	39.6	56.0	4.5
Dairy	46	45.7	50.0	4.3
Fishery	75	49.3	45.3	5.3
Food Sci	33	24.2	69.7	6.1
Forestry	18	44.4	55.6	0.0
Home Sci.	750	36.3	57.3	6.4
Horti.	107	43.9	53.3	2.8
Others	782	42.7	48.0	9.3
Total	4881	41.3	52.2	6.5

B. Tracers' Study

B1: Educational Level-wise Response Rate

Coverage details			
Educational Level	**Questionnaires Sent**	**Response received**	**% response**
UG	2675 (44.6)	353 (16.8)	13.2
PG	1923 (32.1)	933 (44.3)	48.5
PhD	1102 (18.4)	789 (37.5)	71.6
Diploma	300 (5.0)	30 (1.4)	10.0
Total	**6000 (100.0)**	**2105 (100.0)**	**35.1**

B2: Coverage of Respondents by Educational Level and Gender

Gender	**Educational Level**				
	UG	**PG**	**Ph Ds**	**Diploma**	**Total**
Male	263 (16.8)	694 (44.3)	586 (37.5)	22 (1.4)	1565 (74.35)
Female	90 (16.7)	239 (44.2)	203 (37.6)	8 (1.5)	540 (25.65)
Total	353 (16.8)	933 (44.3)	789 (37.5)	30 (1.4)	2105 (100.0)

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B3: Distribution of the Respondents by Year of Last Degree

Year	**Number of respondents**	**Per cent tort total**
2005	382	18.1
2006	334	15.9
2007	266	12.6
2008	320	15.2
2009	351	16.7
2010	452	21.5
All	**2105**	**100.0**

B4: Discipline-wise Current Activity Status of the Respondents

Discipline	Salary employed	Self employed	Looking for job	Pursuing higher study	Total
Agriculture	502 (55.7)	1 (0.0)	30 (3.3)	368 (40.8)	901(100.0)
Agriculture Engineering	56 (61.5)	0 (0.0)	1 (1.1)	34 (37.4)	91 (100.0)
Agribiotech	43 (51.8)	0 (0.0)	4 (4.8)	36 (43.4)	83 (100.0)
Vet. & AH	318 (72.9)	1 (0.0)	7 (1.6)	110 (25.2)	436 (100.0)
Dairy Technology	49 (69.0)	0 (0.0)	3 (4.2)	19 (26.8)	71 (100.0)
Fishery Science	33 (63.5)	0 (0.0)	3 (5.8)	16 (30.8)	52 (100.0)
Food Technology	34 (81.0)	0 (0.0)	1 (2.4)	7 (16.7)	42 (100.0)
Forestry	37 (77.1)	0 (0.0)	0 (0.0)	11 (22.9)	48 (100.0)
Home Science	59 (68.6)	0 (0.0)	0 (0.0)	27 (31.4)	86 (100.0)
Horticulture	48 (52.7)	2 (2.0)	2 (2.2)	39 (42.9)	91 (100.0)
Others	69 (33.8)	0 (0.0)	6 (2.9)	129 (63.2)	204 (100.0)
Total	**1248 (59.3)**	**4 (0.2)**	**57 (2.7)**	**796 (37.8)**	**2105** (100.0)

B5: Gender-wise Current Status of the Respondents

Present Status	**Gender Distribution**		
	Male	**Female**	**Total**
Salaried Employed	984 (62.9)	264 (48.9)	1248 (59.3)
Self-employed	3 (0.2)	1(0.2)	4(0.2)
Looking for Job	38(2.4)	19(3.5)	57(2.7)
Pursuing Higher Study	540 (34.5)	356(47.4)	796 (37.8)
Total	**1565 (100.0)**	**540(100.0)**	**2105(100.0)**

B6: Discipline-wise Areas of Employment of the Employed Respondents

Discipline	Areas of employment of salaried agriculture educated				
	Research	**Govt. Office**	**Production and Processing Units**	**Not Reporting**	**Total**
Agriculture	76	89	37	300	502
Agriculture Engineering	21	15	7	13	56
Agribiotech	3	8	12	20	43
Vet. Science &AH	23	59	-	236	318
Dairy Technology	3	2	12	32	49
Fishery Science	7	9	2	15	33
Food Technology	1	2	11	20	34
Forestry	9	5	-	23	37
Home Science	3	9	1	46	59
Horticulture	6	19	7	16	48
Others	7	9	9	44	69
Total	**159**	**226**	**98**	**765**	**1248**

B7: Perception about Adequacy of the Agriculture Education

Discipline	**Fully Adequate**	**Partly Adequate**	**Not at all**	**No Response**	**Total**
Agriculture	221 (24.5)	41 (4.6)	320 (35.5)	319 (35.4)	901 (100.0)
Agri. Engg	35 (38.5)	8 (8.8)	42 (46.2)	6 (6.6)	91 (100.0)
Agribiotech	13 (15.7)	3 (3.6)	35 (42.2)	32 (38.6)	83 (100.0)
Vet. Sci &AH	84 (19.3)	21 (4.8)	200 (45.9)	131 (45.9)	436 (100.0)
Dairy Technology	18 (25.4)	2 (2.8)	17 (23.9)	34 (47.9)	71 (100.0)
Fishery Science	17 (32.7)	3 (5.8)	12 (23.1)	20 (38.5)	52 (100.0)
Food Technology	7 (16.7)	0 (0.0)	8 (19.0)	27 (64.3)	42 (100.0)
Forestry	11 (22.9)	4 (8.3)	23 (47.9)	10 (20.8)	48 (100.0)
Home Science	20 (23.3)	0 (0.0)	21 (24.4)	45 (52.3)	86 (100.0)
Horticulture	38 (41.8)	9 (9.9)	42 (46.2)	2 (2.2)	91 (100.0)
Others	41 (20.1)	10 (4.9)	57 (27.9)	96 (47.1)	204 (100.0)
Total	**505 (24.0)**	**101 (4.8)**	**777 (36.9)**	**722 (34.3)**	**2105 (100.0)**

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B8: Graduates Future Plans

Discipline	Total Respondents	Per cent respondents			
		Academic & Research	Govt/ civil jobs	Business	Others
Agriculture	901	56.3	23.3	18.3	2.1
Agriculture Engineering.	91	56.0	24.2	18.7	1.1
Agriculture biotechnology.	83	56.6	24.1	18.1	1.2
Veterinary.& AH.	436	56.4	23.2	18.3	2.1
Dairy	71	56.3	22.5	18.3	2.8
Fishery	52	55.8	25.0	17.3	1.9
Food Science	42	54.8	23.8	19.0	2.4
Forestry	48	54.2	25.0	18.8	2.1
Home Science.	86	58.1	23.3	17.4	1.2
Horticulture	91	56.0	24.2	19.8	0.0
Others	204	56.4	22.1	18.1	3.4
Total	2105	56.3	23.3	18.3	2.0

C. Establishment Survey

C1: Distribution of Establishments Covered by Major Activity and Ownership Type

Major Activity	Type of Ownership					
	Government	**Public sector**	**Private sector**	**Co-operatives**	**Self Employed**	**Total**
Agriculture	757 (50.7)	232 (49.9)	686 (59.2)	15 (20.5)	146 (58.4)	1836 (53.4)
Animal Science	170 (11.4)	40 (8.6)	71 (6.1)	13 (17.8)	24 (9.6)	318 (9.2)
Horticulture	301 (20.2)	35 (7.5)	139 (12.0)	26 (35.6)	45 (18.0)	546 (15.9)
Food Science	5 (0.3)	10 (2.2)	13 (1.1)	1 (1.4)	6 (2.4)	35 (1.0)
Dairy Science	35 (2.3)	15 (3.2)	145 (12.5)	4 (5.5)	8 (3.2)	207 (6.0)
Fisheries	72 (4.8)	25 (5.4)	13 (1.0)	1 (1.4)	0 (0.0)	111 (3.2)
Biotechnology	12 (0.8)	21 (4.5)	16 (1.4)	9 (12.3)	0 (0.0)	58 (1.7)
Forestry	67 (4.5)	9 (1.9)	29 (2.5)	0 (0.0)	10 (4.0)	115 (3.3)
Financial Institutions	40 (2.7)	52 (11.2)	23 (2.0)	3 (4.1)	0 (0.0)	118 (3.4)
Others	33 (2.2)	26 (5.6)	24 (2.1)	1 (1.4)	11 (4.4)	95 (2.8)
Total	**1492 (100.0)**	**465 (100.0)**	**1159 (100.0)**	**73 (100.0)**	**250 (100.0)**	**3439 (100.0)**
%	**43.4**	**13.5**	**33.7**	**2.1**	**7.3**	**100**

C2: Distribution of Establishment by Location and Major Activities

Type of Activity of the Establishment	Rural	Urban
Agriculture	60.78	39.22
Animal Science	55.34	44.66
Horticulture	40.10	59.90
Food Science	54.14	42.86
Dairy Sc./Tech	61.83	38.17
Fisheries	69.36	30.64
Bio- Tech	43.10	56.90
Forestry	66.08	33.92
Financial Institutions	52.54	47.46
Others	36.84	63.16

C3:Establishments by Major and Sub-Category of Activity

Major Activity	No. of Estab lishments	Res, Edu, Extn	Input Industries	Production/ processing Units	Govt. Sector	Trade	Others
Agriculture	1836	197	523	627	139	174	176
Horticulture	546	63	7	336	73	33	34
Dairy	207	4	0	195	4	3	1
Fisheries	111	1	1	54	45	6	4
Bio- Tech	58	9	24	15		0	10
Financial	118	1	0	0	2	0	115
Forestry	115	9	3	51	41	1	10
Veterinary	318	52	58	84	49	2	73
Food Sci	35	6	3	22	1	0	3
Others	95	9	5	19	5	2	55
Total	**3439**	**351**	**624**	**1403**	**359**	**221**	**481**
Per Cent	**100.0**	**10.2**	**18.1**	**40.9**	**10.4**	**6.4**	**14.0**

C4: Distribution of Employees by Major Activities and Gender

Major Activity	Number of Establishments Covered	Percentage of gender-wise employment in total			Average employment per establishment
		Male	Female	Total	
1. Agriculture	1836	94.9	5.1	100.0	43.6
2. Animal Science	318	95.1	4.9	100.0	60.2
3. Horticulture	546	95.0	5.0	100.0	44.6
4. Food Science	35	64.5	35.5	100.0	37.8
5. Dairy	207	97.3	2.7	100.0	117.7
6. Fisheries	111	87.3	12.7	100.0	90.3
7.Bio-Technology	58	94.7	5.3	100.0	69.3
8. Forestry	115	91.3	8.7	100.0	62.2
9. Financial Institutions	118	94.9	5.1	100.0	418.5
10. Others	95	92.9	7.1	100.0	29.1
Total	**3439**	**94.5**	**5.5**	**100.0**	**64.7**

C5: Growth of Employment from 2004-05 to 2008-09

Year	Annual Growth over previous year (%)
2004-05	-
2005-06	12.1
2006-07	16.5
2007-08	20.1
2008-09	2.6
CAGR	**13.8**

C6: Distribution of Employees by Qualification and Gender

Educational Level	All	Women
A. Agricultural Qualification		
Informal Training Certificate	3.6	5.9
Diplomas	5.3	8.1
Graduates	12.6	24.2
Post-Graduates	3.2	6.7
Ph.Ds.	1.4	1.6
Sub-total	**26.1**	**46.5**
B. General Qualification	**73.9**	**53.5**
Total	**100.0**	**100.0**

C7: Distribution of Employees by Major Activity of the Establishment

Major field of establishment	Per cent employees in	
	Same area	Next important area
Agriculture	53.8	Ag engg 7.8
Agri. Engg.	71.0	Agri 29.0
Veterinary &AH	83.8	Agri 9.4
Horticulture	27.0	Agri 37.0
Food Science	45.0	Agri 29.8
Dairy Tech	47.8	Vet 15.6 Agri 14.3
Fisheries	59.3	Agri 19.0
Bio- Tech.	60.1	Ag engg 18.2
Forestry	56.2	Agri 25.8

C8: Establishments Reporting Future Manpower Requirements

Major Activity	No. of Estt.	Requirement in 2020			
		UG	PG	PhD	Total
Agriculture	832	14192	4659	1769	20620
Vet & AH	180	2782	667	440	3889
Horticulture	272	4042	1224	637	5903
Food Science	18	105	120	60	285
Dairy Sc./Tech	128	2209	290	131	2630
Fisheries	61	899	272	80	1251
Bio- Tech	44	789	489	135	1413
Forestry	67	579	237	162	978
Financial Institutions	64	7191	222	36	7449
Others	33	208	170	132	510
Total	**1699**	**32996**	**8350**	**3572**	**44928**

C9: Vacancies Arising & Filled in Reporting Establishments

Year	No. of vacancies arising for graduates and above in agriculture and allied fields							
	Number of vacancies arising due to							
	Retire-ment	Transfers / Resignation	Expansion	Other Reasons	Total Vacancies	Number of Vacancies Filled	No. of organizations reporting	Total Employment of the above organisations
2006-07	298	264	145	163	1281 (13.0)	628 (49.0)	374	9879
2007-08	326	297	446	124	1316 (12.9)	687 (52.2)	403	10211
2008-09	645	947	446	160	3016 (21.5)	1723 (57.1)	523	14059

C10: Establishments Reporting Change

Major Activity	No. of Estt.	Nature of Change proposed for 2020				
		Expansion of the organisations	Diversification of Product Service	Technological Change in Process	Modernization of Organisation	Others
Agriculture	1836	1794 (97.71)	1809 (98.53)	1826 (99.46)	1502 (81.81)	1467 (79.90)
Vet / Animal Science	318	249 (78.30)	207 (65.09)	210 (66.04)	248 (77.99)	161 (50.63)
Horticulture	546	383 (70.15)	410 (75.09)	355 (65.02)	466 (85.35)	302 (55.31)
Food Science	35	20 (57.14)	27 (77.14)	34 (97.14)	32 (91.43)	31 (88.57)
Dairy Tech	207	159 (76.81)	148 (71.50)	148 (71.50)	152 (73.43)	179 (86.47)
Fisheries	111	85 (76.58)	75 (67.57)	93 (83.78)	110 (99.10)	71 (63.96)
Bio- Tech	115	47 (40.87)	78 (67.83)	85 (73.91)	74 (64.35)	89 (77.39)
Forestry	58	35 (60.34)	45 (77.59)	45 (77.59)	45 (77.59)	45 (77.59)
Financial Institutions	118	86 (72.88)	55 (46.61)	85 (72.03)	109 (92.37)	78 (66.10)
Others	95	79 (83.16)	71 (74.74)	71 (74.74)	81 (85.26)	75 (78.95)
Total	**3439**	**2937 (85.40)**	**2925 (85.05)**	**2952 (85.84)**	**2819 (81.97)**	**2498 (72.64)**

C11:Establishments Suggesting Changes in the Skill Set in Education

Number of establishments suggesting	Percentage of establishments suggesting change at	
	UG	PG
More advanced theoretical knowledge	74.8	70.7
More Technical Knowledge	71.7	65.9
More Practical Orientation	63.7	53.0
More Interaction with Industries	63.7	60.5
Managerial Skills	64.0	64.0
Information Technology	57.6	47.8
Agri-Business Economics	52.1	51.4
Any Other (Please specify)	67.3	38.2

C12: Distribution of Employees with Graduate and Above Qualifications by Discipline and Major Activity of Establishment

Major Activity of Establishment	**Percentage distribution of employees (graduates and above) by discipline**												
	Agri-	Agri. Engg.	Vet Sci.	Hort.	Fisher-ies Sc.	Dairy Sc.	Forest	Bio-tech	Home Sc.	Food Tech	Other Agri-Disc.	Other disc.	Total
Agriculture	33.9	7.8	8.1	6.3	1.1	0.9	3.1	5.0	0.7	5.4	19.9	7.7	100
Agri. Engg.	29.0	71.0	-	-	-	-	-	-	-	-	-	-	100
Animal Science	9.4	0.5	83.8	-	-	1.5	-	-	-	-	1.1	3.8	100
Horti-culture	37.0	2.5	-	27.0	2.8	-	6.6	1.6	-	4.2	7.7	10.6	100
Food Science	29.8	-	-	-	-	-	5.8	3.7	9.9	45.0	-	5.8	100
Dairy	7.4	-	15.6	-	-	47.8	-	-	-	0.7	14.3	14.1	100
Fisheries	19.0	-	-	-	59.3	-	-	-	-	-	10.1	11.6	100
Bio- tech.	14.0	18.2	-	2.3	-	-	-	60.1	-	-	4.0	1.4	100
Forestry	25.8	6.8	-	2.6	-	-	56.2	1.3	-	0.4	2.5	4.6	100
Financial	29.4	-	4.9	5.2	-	-	-	-	-	-	13.8	46.7	100
Others	24.9	23.4	12.9	-	-	-	-	6.9	-	-	8.0	23.9	100
Total	**28.7**	**5.0**	**12.1**	**7.7**	**2.5**	**3.4**	**3.6**	**4.6**	**0.4**	**3.4**	**14.0**	**14.5**	**100**

Annexures for Chapter - 15

Annexure-15.1

Outturn of Graduates and above in Agriculture and Allied Sciences (1970 – 1989)

Year	BVSc/ BSc(Dairy)	BSc(Agri)	Msc (Agri)	MVSc / MSc (Dairy)	PhD	All
1950	100	1000	154	0	4	1258
1951	189	1041	192	0	5	1427
1952	172	870	223	0	8	1273
1953	209	879	222	0	4	1314
1954	256	910	203	0	7	1376
1955	289	905	197	0	9	1400
1956	368	893	209	0	13	1483
1957	492	1128	303	0	7	1930
1958	643	1520	306	0	9	2478
1959	821	1950	383	0	16	3170
1960	844	1990	482	0	26	3342
1961	857	2608	610	0	28	4103
1962	774	2609	690	0	42	4115
1963	802	4112	708	0	41	5663
1964	999	4718	814	0	48	6579
1965	1030	5569	1176	0	95	7870
1966	855	5040	939	132	72	7038
1967	1120	6180	920	135	9	8364
1968	1003	5902	1238	139	104	8386
1969	1145	5909	1288	122	106	8570
1970	1171	7205	1432	149	217	10174
1971	1031	5280	1159	226	80	7776
1972	1012	5600	1454	194	283	8543
1973	904	4649	1281	208	145	7187
1974	1018	4550	1394	244	259	7465
1975	892	3851	1365	253	251	6612
1976	1143	4700	1462	271	289	7865
1977	1183	4306	1347	286	295	7417
1978	1060	5075	1337	307	344	8123
1979	925	5166	1585	237	364	8277
1980	1347	5959	1674	246	402	9628
1981	1349	5986	1620	360	501	9816
1982	1336	6061	1725	371	490	9983

1983	13357	6019	1592	294	547	21809
1984	1062	5578	2242	392	576	9850
1985	1104	5633	2274	412	588	10011
1986	1249	5381	2543	417	698	10288
1987	1360	5532	2567	535	571	10565
1988	1415	6043	2334	415	479	10686
1989	1219	6557	2762	508	729	11775

Source: Technical Manpower Bulletin, Vol-4, Agricultural Sciences, CSIR, 1993

Annexure-15.2

Outturn of Graduates and Above in Agriculture and Allied Sciences (1990-1992)

Year	Agri+ Hort+ Forestry	Veterinary + Dairy	Agri-engg	Fishery	Home science	Diploma	All
1989-90	10668	2331	1245	313	717	110	15384
1990-91	10463	2186	1215	265	644	1015	15788
1991-92	10545	2279	1008	206	587	1093	15718
Total	84691	18431	7622	1667	4479	2778	119668

Source: Rama Rao & Muralidhar, AGRIUNIS, 1994.

Annexure-15.3

Outturn of Graduates in Agriculture and Veterinary Sciences for Various Years

Year	Agriculture & Veterinary Sciences		
	UG	PG	PhD
1989	8301	2876	792
1995	5752	2284	827
2003	9109	4416	1195
2004	-	-	1026+116
2005	-	-	888+132
2006	-	-	1119+180

Source: DST R&D Statistics, 2007-08

For 2004-06, PhD outturn data is available for agriculture and veterinary separately

Annexure-15.4

A: Supply Projections (Assuming Average Outturns of 2006-10 Will be Maintained Till 2020)

Year	Agricul-ture	Horti-culture	Forest-ry	Dairy Tech.	Veteri-nary	Agri.-Engg.	Fisher-ies Sci.	Agri-Biotech	All
2009-10	188708	14179	5005	6062	40232	23207	5144	1697	284234
2010-11	193715	14491	5167	6187	41137	23635	5277	1978	291587
2011-12	198907	14820	5333	6317	42073	24092	5415	2257	299214
2012-13	203707	15118	5489	6429	42898	24497	5543	2532	306213
2013-14	208615	15426	5648	6536	43693	24921	5674	2804	313317
2014-15	213194	15708	5798	6648	44512	25301	5796	3074	320029
2015-16	217595	15976	5942	6770	45393	25659	5914	3340	326589
2016-17	221635	16215	6077	6858	46069	25970	6023	3603	332449
2017-18	225600	16448	6210	6944	46725	26273	6129	3864	338193
2018-19	229458	16675	6339	7029	47373	26564	6233	4121	343793
2019-20	233307	16901	6468	7115	48031	26858	6337	4376	349393
Average outturns 2006-10)	**13662**	**1148**	**573**	**410**	**2763**	**1259**	**394**	**515**	**20207**

B: Supply Projections (Assuming Average Outturns of 2006-10 Will Grow at the Same Rate as Observed in 2006-10)

Year	Agricul-ture	Horti-culture	Forest-ry	Dairy Tech.	Veteri-nary	Agri.-Engg.	Fisher-ies Sc.	Bio-tech	All
2009-10	188708	14179	5005	6062	40232	23207	5144	1697	284234
2010-11	194207	14594	5191	6190	41145	23732	5284	2052	292394
2011-12	200405	15144	5407	6326	42096	24390	5435	2495	301698
2012-13	206747	15798	5641	6446	42943	25111	5582	3049	311316
2013-14	213757	16618	5907	6565	43767	25974	5739	3740	322065
2014-15	221020	17590	6196	6690	44623	26929	5894	4602	333544
2015-16	228716	18754	6515	6829	45549	28010	6052	5677	346102
2016-17	236688	20127	6862	6937	46276	29204	6207	7018	359320
2017-18	245252	21768	7248	7045	46989	30566	6368	8692	373928
2018-19	254407	23717	7675	7155	47704	32107	6533	10779	390076
2019-20	264280	26030	8148	7269	48433	33859	6705	13383	408108
Average rate of growth in outturn 2006-10)	5.30	15.66	8.70	(-)4 taken as 1.00	0.40 taken as 1.00	9.70	2.60	24.75	

C: Supply Projections (Assuming Average Outturns of 2006-10 Will Grow at 10 Per Cent Per Year)

Year	Agricul-Ture	Horti-Culture	Forest-Ry	Dairy Tech.	Veteri-Nary	Agri.-Engg.	Fisher-Ies Sc.	Bio-Tech	All
2009-10	188708	14179	5005	6062	40232	23207	5144	1697	284234
2010-11	194644	14557	5194	6215	41322	23735	5302	2008	292976
2011-12	201777	15023	5418	6402	42646	24400	5491	2349	303506
2012-13	209623	15536	5665	6605	44078	25131	5699	2722	315059
2013-14	218784	16143	5949	6838	45720	26010	5942	3131	328517
2014-15	228931	16817	6264	7114	47649	26986	6211	3580	343552
2015-16	240341	17579	6616	7444	49927	28095	6513	4071	360587
2016-17	252963	18423	7005	7787	52314	29325	6847	4611	379273
2017-18	267233	19383	7442	8177	55023	30731	7225	5203	400417
2018-19	283281	20468	7933	8622	58101	32328	7650	5852	424235
2019-20	301384	21699	8484	9131	61599	34148	8128	6565	451137