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## Forestry education in India: Objectives, needs, current status and recommendations

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### Abstract

In the climate change era, global warming is the greatest environmental challenge of the twenty-first century in India. Forestry education is one of the best tool to fight these challenges around the world as well as India. Forestry education at UG, PG and PHD level was recommended by National Commission on Agriculture (1976) and first it was introduced at Solan (Himachal Pradesh) in 1976. About 1600 forestry professionals are produced every year under ICAR and ICFRE forestry education systems in India. Further, National Forest Policy (1988) and National Forest Commission (2006) recommended that forestry graduates should be utilized in forest departments through proper weightage and preferences to conserve and manage the natural resources of the country as developed professional forestry human resources in the country. Now, it is compulsory to introduce the forestry subject at primary and secondary school level from childhood. It is prime duty of FRI University to introduce forestry education at graduation level under ICFRE system to empower the higher education in forestry sector throughout the country. It is also necessary to fill various vacant (more than 70%) posts in the field of forestry across the country to conserve remaining biodiversity of the country. Thus, all these gaps can be fulfilled by empowering forestry education to achieve a safer environment for our children (future generations) in this climate change era.

**Keywords:** Climate change, forestry education, national commission on agriculture, national forest commission, childhood

### Introduction

Climate change and global warming is the greatest environmental challenge of the twenty-first century in India as well as globally. This leads the major global threats viz. poverty, hunger, population growth, armed conflict, air pollution, water pollution, displacement, soil degradation, deforestation and desertification. It is necessary to find a solution of climate change concern. There are several approaches to slowing of this critical situation in India. Forestry education is one of the best tool to fight these challenges. Forests and agriculture (Natural resources) are very important for sinking its current and future effects on living beings. Scientific information on environment, agriculture and forest are major potentials for mitigation through carbon pools and "sinks" system as well as most climate-resilient integrity of natural resources. They also regulate or revive the waterways of rivers of entire regions of the country. First and concrete step has been taken by the international community to combat global warming with a target to reduce net carbon emissions by 5.2 percent below 1990 levels in 1997 at Kyoto (Japan).

Keep in mind, forestry education became a powerful tool to manage the natural resources in sustainable manner. In India, forestry education was introduced first in 1976 at Solan (ICAR 2009) <sup>[1]</sup>, however professional forestry education was introduced almost 200 years ago (Ratnasingam *et al.* 2013) <sup>[5]</sup> in Germany. Therefore, now it is urgent need to empower the forestry education in India with proper education scheme or management. This is also necessary to utilize the developed forestry human resource viz., graduate in forestry, post graduate in forestry and doctoral in forestry to conserve the remaining biodiversity.

### Forestry education

Forestry education is a process of alleviating teaching, learning, storytelling, acquisition of knowledge, skills, training, values, habits, beliefs and directed research of forestry subject. Forestry science is an art and science (applied science as well as traditional science) to understanding, creating, managing, conserving and using wisely the natural resources for human and environmental benefits.

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“Forestry science prepares professional students to manage the natural resources in an environmentally, socially and economically sustainable manner”.

#### List of current issues that addressed by forestry education

1. Climate change and Global warming
2. Biodiversity conservation
3. Agroforestry development
4. Soil and Environmental degradation
5. Sustainable social and economic development
6. Wildlife management
7. Production of Timber and Non Timber Forest Products
8. Tree cultivation or farming
9. Revive of rivers
10. Natural resource management

#### Career in Forestry

The starting point for a career in forestry is at the undergraduate level in India. Metric plus two or equivalent students with Physics, Chemistry Biology and Mathematic subjects is eligible for the 4 years B.Sc. Forestry (Honors) degree programme in India. Further, at the Master and Ph.D. level, there are several specialization subjects like Silviculture, Plantation Forestry, Agroforestry, Forest Genetics, Tree Breeding, Tree Improvement, Forest Biotechnology, Medicinal and Aromatic Plants, Forest Product Utilization, Wood Science and Technology, Forest Management, Forest Economics, Forest Business Management, Wildlife Science Management, Eco-Tourism Management, Natural Resource Management, Environment Management, Watershed Management etc. However, access to forestry education at all levels has widened significantly in Nepal over the last two decades. Hence, human resource developments (HRD) in forestry sector are become so important to fight against climate change and global warming issue for better understanding of forest and agricultural resources. It is also necessary to introduce the forestry subject at primary and secondary level in village schools because they produce a good quality education from childhood.

#### Recommendations for forestry education in India

The Report of the National Commission on Agriculture (1976) comprises 69 chapters in 15 parts. Part -IX deals with forestry subject including six chapters viz. 41. Forest Policy, 42. Production and Social Forestry, 43. Minor Forest Produce, 44. Forest Ecology and Wildlife Management, 45. Forest Protection and Law and 46. Forest Planning, Research and Education. However, Central Board Forestry was established in 1950 and shared detailed report with National Commission on Agriculture in 1974. National Commission on Agriculture (1976) recommended on forestry subject with some highlighted points related to policy, planning, education and research as follows (NCA 1976) [2]:

- A revision of National Forest Policy (1952) was recommended.
- The introduction of teaching in forest science in the agricultural and other universities, which are to undertake forest research. They should to begin with include forestry as one of the subjects in the undergraduate course, the scope of forest education being gradually widened to graduate, master's and doctorate degree courses in forestry.
- NCA had recommended for direction and promotion of forest research and education in India by establishment an

agency (Council of Forest Research and Education).

- The direction was given to the Forest Research Institute, Dehra Dun to organize graduate, master's and doctorate degree courses in forest science.

National Forest Policy (1988) was outlined on Forestry Education in Para- 4.11 as following (NFP 1988) [4]:

“Forestry should be recognized both as a scientific discipline as well as a profession. Agriculture universities and institutions, dedicated to the development of forestry education should formulate curricula and courses for imparting academic education and promoting postgraduate research and professional excellence, keeping in view the manpower needs of the country. Academic and professional qualifications - in forestry should be kept in view for recruitment to the Indian Forest Service and the State Forest Service. Specialized and orientation courses for developing better management skills by inservice training need to be encouraged, taking into account the latest development in forestry and related disciplines”.

Further, National Forest Commission (2006) recommended on utilization of forestry graduate in chapter-16 with following articles (NFC 2006) [3]:

“Article-301 (Forest administration should take advantage of forestry education in the universities by at least giving preference in selection for the posts of forest officers.), article-302 (Recruitment to forest rangers should be from amongst B. Sc. Forestry graduates produced by universities imparting forestry education.), article- 303 (Forestry should be recognized as a subject for competitive examinations in state and All India Administrative Services.), article- 307 (Specialization is a prerequisite in forestry to enable the service to fulfill its role in conserving the forest ecosystems and its biota, in extending forestry within and without existing forests, and in fulfilling the needs and aspirations of the people vis-à-vis forestry.), and article-309 (The same study referred above should also consider as to what changes are required in the recruitment rules for the individual specialized sub-cadres, and the training and training periods required for recruits with degrees in subjects related to forestry and forestlands like botany, biology, zoology, ecology, forestry, ethology, environmental sciences, etc, and for those recruits who have other science degrees. But weightage has to be given to those recruits who have graduated in subjects related to forestry as against those who have science degrees not related to forestry and ecology, and this should be reflected in the period of induction training. This, in itself, will encourage candidates to opt for relevant subjects in their college education”.

#### Objective of forestry education in India

- To develop technically qualified forestry professionals with sufficient knowledge and skills
- To prepare the human resources which enable to serve in the forest department
- To encourage the young professional for forestry enterprises
- To equip the forester with new innovative research and technology to fight against climate change and global warming
- To develop the young scientists in the field of forestry such as agroforestry, silviculture, forest genetic, tree breeding, forest products, natural resource management, medical & aromatic plants, agro biodiversity

conservation, agricultural wildlife management etc (ICAR 2009) <sup>[1]</sup>.

### Historical development of forestry education in India

In India, Forestry Education was first introduced at the University level by starting M. Sc. Forestry in 1976 at Solan (Himachal Pradesh). The B. Sc. Forestry degree programme started at Ranchi (Jharkhand) in 1979. In 1985 many Agricultural Universities started B. Sc. Forestry programme under ICAR (Indian Council of Agricultural Research) system (ICAR 2009) <sup>[1]</sup>. Today, 28 Central/ State Agricultural Universities offer professional degree programme in Forestry out of 51. There are several separate forestry colleges within Agricultural Universities; some have Forestry with Horticulture College. However, Forest Research Institute (FRI), Dehra Dun was became the Deemed University in December 1991 after creation of Indian Council of Forestry Research and Education (ICFRE) in 1988. PG and PhD in forestry was introduced in FRI, Dehra Dun to develop forestry human resources in India. Although, there are several central/

state traditional universities and various private universities/ colleges which are also provide forestry education.

### Current status of forestry education in India

In the present time, forestry education in India under ICAR system is running very well as compare to ICFRE system. There are 28 central/state agricultural universities which provide the quality forestry education at Under Graduate (UG) level, Post Graduate (PG) level and Doctor of Philosophy (PhD) among 51 central/state agricultural universities in the country after four decades of its introduction. The total intake capacity in UG in B.Sc. Forestry Honors (Four Year Course) is 1091 in the country (Table 1.). In PG (M. Sc. Forestry), 365 students can be enrolled annually, whereas only 81 in PhD Forestry (Table 1.). About 1500 forestry professionals are produced every year in the country under ICAR system. However, annually FRI provide 80 PG and 20 PhD degrees in forestry subject under ICFRE system.

**Table 1:** List of Agricultural Universities which provide quality forestry education in India

S. No.	Name of Agricultural University	Address	State	UG Intake	PG Intake	PhD Intake
Central Agricultural Universities						
1	Central Agricultural University	Imphal	Manipur	35	6	0
2	Rani Laxmi Bai Central Agricultural University	Jhansi	Uttar Pradesh	20	0	0
3	Dr. Rajendra Prasad Central Agricultural University	Pusa (Samastipur)	Bihar	30	0	0
Deemed Agricultural Universities						
4	ICAR-Indian Agricultural Research Institute	New Delhi	New Delhi	0	0	0
State Agricultural Universities						
5	Acharya NG Ranga Agricultural University	Guntur	Andhra Pradesh	0	0	0
6	DR. YSR Horticultural University	Venkataramannagudem	Andhra Pradesh	0	0	0
7	Assam Agricultural University	Jorhat	Assam	0	0	0
8	Bihar Agricultural University	Sabour, Bhagalpur	Bihar	0	0	0
9	Indira Gandhi Krishi Viswa Vidhyalaya	Raipur	Chhattisgarh	0	10	5
10	Sardar Krushinagar Dantiwada Agricultural University	Dantiwada	Gujarat	0	0	0
11	Anand Agricultural University	Anand	Gujarat	0	0	0
12	Navsari Agricultural University	Navsari	Gujarat	60	16	4
13	Junagarh Agricultural University	Junagarh	Gujarat	0	0	0
14	Chaudhary Charan Singh Haryana Agricultural University	Hisar	Haryana	0	7	3
15	Haryana State University of Horticultural Sciences	Karnal	Haryana	0	0	0
16	Ch. Sarwan Kumar Himachal Pradesh Krishi Viswavidyalaya	Palampur	Himachal Pradesh	0	0	0
17	Dr. Yaswant Singh Parmar University of Horticulture & Forestry	Solan	Himachal Pradesh	200	30	20
18	Birsa Agricultural University	Ranchi	Jharkhand	55	20	5
19	Sher-e-Kashmir University of Agricultural Science & Technology	Srinagar	Jammu & Kashmir	35	15	5
20	Sher-e-Kashmir University of Agricultural Science & Technology	Jammu	Jammu & Kashmir	0	5	4
21	University of Agricultural Sciences	Bangalore	Karnataka	0	3	3
22	University of Agricultural Sciences	Raichur	Karnataka	0	0	0
23	University of Agricultural Sciences	Dharwad	Karnataka	60	20	6
24	University of Horticulture Science	Bagalkot	Karnataka	0	0	0
25	University of Agriculture & Horticulture Sciences	Shimoga	Karnataka	60	10	0
26	Kerala Agricultural University	Thrissur	Kerala	36	15	10
27	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya	Gwalior	Madhya Pradesh	0	0	0
28	Jawaharlal Nehru Krishi Viswa Vidyalaya	Jabalpur	Madhya Pradesh	35	6	3
29	Dr. Balaesahib Sawant Kokan Krishi Vidyapeeth	Dapoli	Maharashtra	40	10	0
30	Vasantao Naik Marathwada Krishi Vidyapeeth	Parbhani	Maharashtra	0	0	0
31	Matatam Phule Krishi Vidyapeeth	Rahuri	Maharashtra	0	0	0
32	Dr. Punjabrao Deshmukh Krishi Viswa Vidyalaya	Akola	Maharashtra	40	10	0
33	Orissa University of Agricultural & Technology	Bhubaneswar	Orissa	50	30	0
34	Punjab Agricultural University	Ludhiana	Punjab	0	10	2
35	Maharana Pratap University of Agriculture & Technology	Udaipur	Rajasthan	0	0	0

36	Swami Keshwanand Rajasthan Agricultural University	Bikaner	Rajasthan	0	0	0
37	SKN Agriculture University	Jobner	Rajasthan	0	0	0
38	Agriculture University	Kota	Rajasthan	55	20	0
39	Agriculture University	Jodhpur	Rajasthan	0	0	0
40	Tamil Nadu Agricultural University	Coimbatore	Tamil Nadu	60	20	4
41	Sri Konda Laxman Telangana State Horticultural University	Hyderabad	Telangana	0	0	0
42	Professor Jayashankar Telangana State Agricultural University	Hyderabad	Telangana	0	0	0
43	G.B. Pant University of Agriculture & Technology	Pantnagar	Uttarakhand	0	0	0
44	VCSG Uttarakhand University of Horticulture & Forestry	Bharsar	Uttarakhand	60	20	0
45	Chandra Shekhar Azad University of Agricultural & Technology	Kanpur	Uttar Pradesh	40	0	0
46	Narendra Deva University of Agriculture & Technology	Faizabad	Uttar Pradesh	0	2	0
47	Sardar Vallabhbhai Patel University of Agriculture & Technology	Meerut	Uttar Pradesh	0	0	0
48	Banda University of Agricultural and Technology	Banda	Uttar Pradesh	60	10	0
49	Sam Higginbottom University of Agriculture, Technology & Sciences	Allahabad	Uttar Pradesh	60	60	10
50	Bidhan Chandra Krishi Viswavidyalaya	Mohanpur	West Bengal	0	0	0
51	Uttar Banga Krishi Viswavidyalaya	Cooch Behar	West Bengal	0	10	0
Total				1091	365	84

(Data source: Annual reports and prospects of each agricultural university)

**Failure to implement national recommendations related to Forestry Education in India**

- Forest Research Institute, Dehra Dun was unable to introduce forestry education of graduate degree course in forest science on the recommendation of NCA (1976) and CBF or even after establishment of ICFRE, Dehra Dun in 1988.
- Several state forest departments was unable to recognize forestry as a subject for competitive examinations in state such as state administrative services, State Forest Services, Assistant Conservator of Forest, Range Forest officers etc. with appropriate weightage to the forestry

professionals in India except few (Table 2.).

- In the climate change era, more than 70 percentage forest officer posts are vacant in various Indian forest departments of the country as per current situations and therefore, forest department is unable to conserve biodiversity, plantation and forest management activities.
- Even several forestry lecturer’s posts (more than 50%) are vacant of forestry colleges under agricultural university and forest research institute university in India, however there is huge demand of forestry qualified for forestry faculty (Sing 1990) [6].

**Table 2:** List of state forest department which utilize the forestry professionals with appropriate weightage/ preferences

S. No.	Name of Forest Department	State
1	J&K Forest Department	Jammu & Kashmir
2	Himachal Pradesh Forest Department	Himachal Pradesh
3	Tamil Nadu Forest Department	Tamil Nadu
4	Kerala Forest Department	Kerala
5	Karnataka Forest Department	Karnataka
6	Odisha Forest and Environment Department	Odisha
7	Gujarat Forest and Environment Department	Gujarat
8	Manipur Forest Department	Manipur
9	Arunachal Pradesh Environment and Forest Department	Arunachal Pradesh

(Data source: public service commission recruitments of each state Forest Department of India)

**Conclusions and Recommendations**

It is compulsory to introduce the forestry subject at primary and secondary school level in village schools because they produce a good quality education from childhood of a student. Forest Research Institute University should introduce forestry education at graduation level (B. Sc. Forestry degree course) under the crown umbrella of ICFRE in forest science at FRI, Dehradun and at different research institutes viz. TFRI, Jabalpur; AFRI, Jodhpur; HFRI, Shimla; RFRI, Jorha; IWST, Bangalore; IFB, Hyderabad; IFGTB, Coimbatore; IFP, Ranchi; FRC-SD, Chhindwara; FRC-LE, Agartala; FRC-ER, FRC-BR, FRC-CE, Visakhapatnam; Aizawl; Allahabad etc. Forestry subject must include in all the state administrative/forest services with appropriate weightage to the forestry professionals. Immediately, it is necessary to fill the 70 percentage vacant forest manager/officer post in

various Indian forest departments to conserve the remained biodiversity in India. It is also necessary to fill various lecturers post in forestry colleges under agricultural university to empower the forestry education in India. Thus, these all gaps in forestry education should be fulfilled to achieve a safer environment to the future generations (our children) in this climate change era.

**References**

1. ICAR. New and restructured post-graduate curricula and syllabi of Forestry. Indian Council of Agricultural Research, New Delhi, 2009.
2. NCA. National Commission on Agriculture, India. Government of India, New Delhi, 1976.
3. NFC. National Forest Commission Report, India. Government of India, New Delhi, 2006.

4. NFP. National Forest Policy, India. Government of India, New Delhi, 1988.
5. Ratnasingam J, Ioras F, Vacalie CC, Wenming L. The future of professional forestry education: trends and challenges from the Malaysian perspective. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*. 2013; 41(1):12-20.
6. Singh K. Status of agroforestry education in India. *Agroforestry Systems*, 1990; 12:97-102.