Project Proposal for Financial Assistance under CAMPA Scheme

Renovation & Modernization of Xylarium of Forest Research Institute, Dehradun, Uttarakhand and establishment of 'Demonstration Centre of Amazing Wood Biodiversity of India'

Submitted to

Ministry of Environment, Forest and Climate Change
Government of India
New Delhi

by

Forest Research Institute
Indian Council of Forestry Research and Education
(An autonomous organization of Ministry of Environment, Forests and Climate Change, Govt. of India)
Dehradun
Uttarakhand

RENOVATION & MODERNIZATION OF FOREST RESEARCH INSTITUTE XYLARIUM (DDW) AND ESTABLISHMENT OF 'DEMONSTRATION CENTRE OF AMAZING WOOD BIODIVERSITY OF INDIA'

Implementing agency: Wood Anatomy Discipline, Botany Division, Forest Research Institute (FRI) under Indian Council of Forestry Research and Education, an autonomous organization of Ministry of Environment, Forests and Climate Change, Govt. of India, P.O. New Forest, Dehradun, Uttarakhand-248006

Project Director: Dr. Renu Singh, Director, FRI

Project Leader: Dr. Sangeeta Gupta, Scientist-G, Forest Research Institute, Dehradun.

Team Member: Mr. Dheeraj Kumar-Scientist-B

Dr. Ashutosh Pathak, Scientist-B

Dr. Dheerendra- Senior Technical Officer

Project Period: Two years (One year each for two Xylarium)

Major work required to be done: I- Civil work; II- Electric work; III-Interior work; IV-brochures, leaflets, publications, memberships; V-Furniture & Equipments. Improvisation of the existing halls (two in number) for display of authentic wood samples of India and other countries for understanding and easy access for researchers, scientists, academicians and general public.

Project Cost: Rs. 125.00 Lakhs (One hundred and twenty five Lakhs only)

Submission of Project: CAMPA Scheme, MoEF&CC, New Delhi

Executive Summary

Forest Research Institute (FRI) is one of the prestigious forestry institutions in the South-East Asia. It has very rich collections of forest products that are of exceptional educational value.

Forest Research Institute (FRI) **Xylarium (DDw)** owes its origin in 1878, and is registered with **Index Xylariorum, International Wood Collections of the World**, the code address of which is DDw. **Xylarium is a collection of authentic wood samples. The FRI Xylarium ranks first in India and is considered among the best in the world for tropical woods. It is a pre-requisite for research in Wood science. The Indian wood collection in these Xylaria are priceless and can never be recreated.**

The Fri Xylarium is a unique collection of Indian woods and attracts visitors and Scientists both from India and abroad and they are appreciative of the biodiversity of India which is beautifully depicted through our huge collection of Indian woods. The collection holds its extraordinary importance due to being nucleus for carrying out wood identification.

Two sets of the Indian collections were made and placed at different places (Xylarium-I and Xylarium-II) to avoid damage by any natural catastrophe. Both the Xylaria are proposed for renovation and modernization.

In India, FRI is the premier organization that provides yeomen service of wood identification to the entire country since past several decades. Our regular clients include almost all government and private organizations viz. **Police, CBI, Vigilance, Anti-corruption Bureau, Defense, Customs, Port Trust of India, National Tests Houses, Forensic Labs, Railways, Housing Corporations, Sports Authority of India, Archaeological Survey of India, B.S. Institute of Palaeobotany, Botanical Institutes, Timber based Industries, Bureau of Indian Standards, Handicrafts, Forest Departments, Electricity Boards** etc. This service has mainly been possible due to huge collection of authentic wood samples housed in Xylarium- I & II that acts as the reference material. These Xylaria are continuously used by the scientists of the Wood Anatomy Discipline to carry out wood identification (to match the internal structure of unknown wood sample with the known ones)

History

Presently, the Xylarium comprises over 18000 wood specimens. 8156 Indian samples of 1500 woody species belonging to 105 families and 10248 samples from foreign countries were received through exchange over the years. The collection specializes in tropical timbers particularly South East Asia and Pacific region. Wood specimens were collected from different forest areas of the country and from different laboratories all over the world through exchange. The collection includes wood samples collected by renowned botanists like J.S. Gamble, Dr. N. Wallich, Dr. Griffith, Sir D. Brandis, Mr. Sulpiz Kurz, Col. Ford, Sir George King and Prof. H.P. Brown. In post independence era it has been further enriched by collection of hundreds of wood samples from all over the country by FRI scientists.

There is also an excellent collection of **microscopic slides** for most of these woods, which provides a rich source of easily accessible material for research workers. There are also old wood samples that are important to **archaeology, geology** or **paleontology**.

Unique Exhibits of Indian Woods

The great biodiversity exhibited by the plants is also reflected in their woods. **Indian woods** show a remarkably wide range of variation in their physical properties such as colour, odour, texture, weight, hardness etc. In colour, the woods range from almost creamy white to jet-black through varying shades of yellow, pink, red, brown & purple. Some of them have characteristic smell like Sandalwood, Deodar, Teak etc. Similarly, they may be soft to very soft, hard to very hard. In weight, they may be light to very light, heavy to very heavy. Display also includes different types of wood fibres used for making different type of Papers.

Archaeological samples of Indus valley civilization period (2000-1000 BC) displayed, reflect upon the good knowledge of wood properties during those times as well as the timeless and immutable Indian customs. The oldest record of rice cultivation dating ~2500 BC has also been displayed. The oldest **Fossil wood sample** displayed dates back to 30 million years.

Foreign Woods Collection

Wood specimens were collected from all over the erstwhile India and thus several wood samples from Myanmar, Pakistan and Bangladesh still form a part of Indian collection. Foreign wood specimens were received on exchange basis from all other continents viz. Europe, Africa, Asia, Oceania, North America and South America. Earliest wood samples were received from Central Africa (Nigeria) in 1936 sent by Chief Conservator of Forests, followed by samples from Kenya, Ethiopia, Sudan etc. during 1955-57.

Establishment of demonstration centre: The centre is proposed to spread awareness among the visitors and to demonstrate the applications and wood structural diversity of Indian woods . Also it shall be able to answer general curiosity of common man such as-

1. Why Balsa wood is used in spacecraft?
2. Why Cricket bats are made from willow and hockey from hickory, ash or mulberry?
3. Why Walnut is used in Rifle butts?
4. Why Sal is suitable for door frame and teak for door panels?
5. What are CITES woods (woods banned from export)
6. Which is the Lightest wood/Heaviest wood of India
7. Different colour woods (from almost creamy white to jet-black through varying shades of yellow, pink, red, green, brown & purple)
8. Most sweet/ Foul smelling wood
9. Smooth/Coarse textured wood
10. Best Marine woods
11. What are Fossil woods and their importance in predicting past climate

At present the Xylarium is accessible to a confined group including researchers and eminent personalities but not to general public.

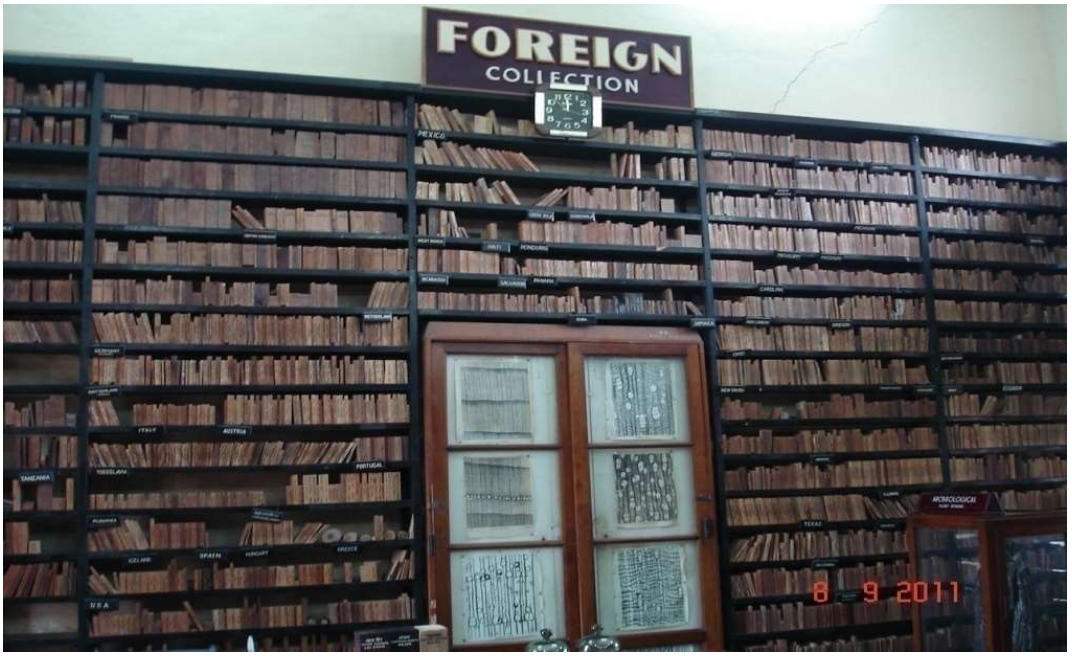
NEED FOR RENOVATION AND MODERNIZATION:

The Xylaria require to be upgraded keeping in view the threat from natural calamities and biodegradation to the priceless wood collection of India and abroad. The collection is extremely important for forestry and wood science research and education. The present displays require upgrading and refurnishing. Currently only professionals and forestry scientists are able to understand the displays of wooden exhibits. A total reorganization of the wood samples is required to sustain them over a long period of time. The wood collection is already of international standard but its presentation requires upliftment. The exhibits can be made dynamic and a center of public education and for the promotion of mass awareness on forestry and conservation of forest resources. A lot of potential is available for making the exhibits more interactive for the general public by application of modern display systems. The up-gradation will be done predominantly by utilizing the existing exhibits. Exhibits need to be made self explanatory to visitors by effective electronic communication systems.

XYLARIUM UPGRADATION: TENTATIVE ESTIMATE OF THE BUDGET	
Civil Works: (Estimated Cost ~Rs. 20.00 Lakhs)	
List of Works	**Need analysis**
Renovation and repair work of Xylarium–II	a) Treatment of ceiling b) Construction of sun shades on window to avoid damage from rain c) Change of damaged wooden shutters of windows. d) Treatment of walls for protecting them from ground seepage. e) Anti termite treatment. f) Minor repairing works wherever required. g) Painting h) Stairs and walk way at 9 feet
Advisory Work: (Estimated Cost ~Rs. 5.00 Lakhs)	
Demonstration Centre of Amazing Wood Biodiversity of India	Museum Consultant and surveyor.
Interior Works: (Estimated Cost ~Rs. 100.00 Lakhs)	
Modernization of Xylarium and establishment of Demonstration Centre of Amazing Wood Biodiversity of India	a) Construction of double height fixed high grade steel (SS) airtight Almirahs of size 16 ft x5 ft x 2 ft with perforated partitions at every 1 ft, sliding doors at 4 ft, for housing wood samples. b) Airtight wooden almirahs/cabinets for display of wooden discs and Exhibits for demonstration. c) Stairs and pathway for upper almirahs. d) Electronic display systems in cabinets/audio-visual display /Projector. e) Interactive display techniques, graphics, paintings, participatory/interactive exhibits by means of animation techniques/touch screens with the help of museum experts. f) Preparation of labels, write-ups and information retrieval systems. g) Appropriate colouring, lighting and other display elements. h) Microscope attached to Desktop computer with large monitor. i) Dehumidifiers and Fans j) Fire Extinguishers with electronic control through smoke detector k) CCTV cameras

XYLARIUM-I

FRI XYLARIUM-I (Indian woods)

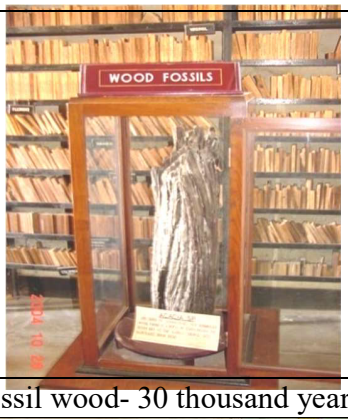
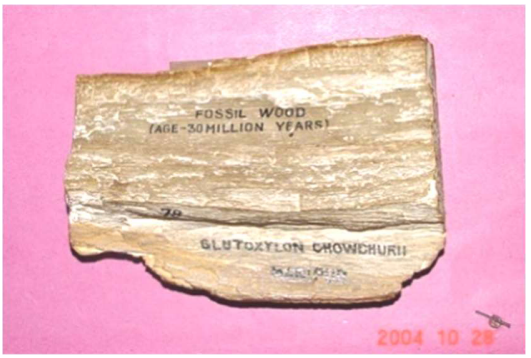


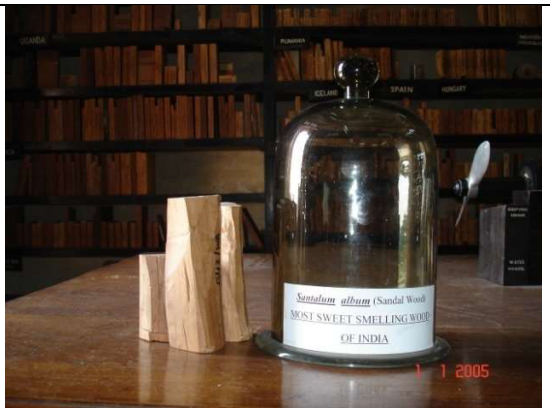
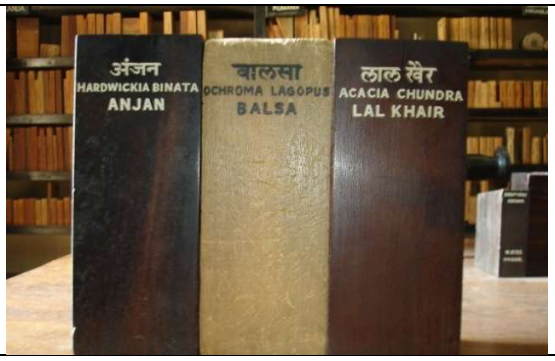
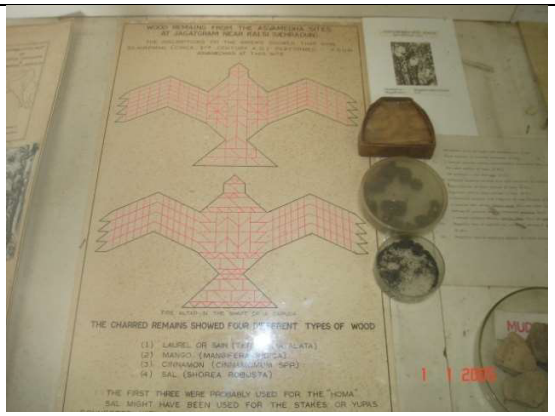
FRI XYLARIUM-I (Foreign Woods)

XYLARIUM –II

MICRO SLIDE COLLECTION

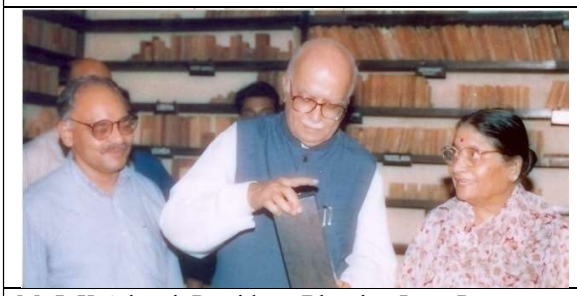
XYLARIUM Exhibits

	
Fossil wood- 30 thousand years old	Fossil wood- 30 million years old.
	
Oldest Record of Rice Cultivation In India - 2300BC	Wood Coffin from Harappa- 2000BC
	
Wood Fossil Records Of Burzahom, Kashmir	Wood Records of Karla Caves, Maharashtra

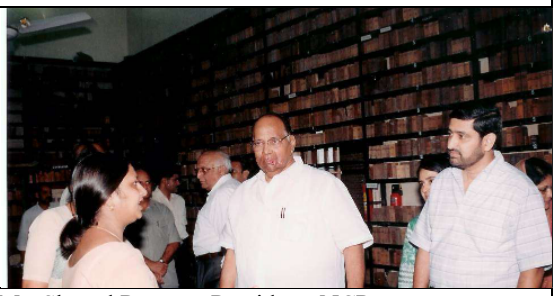
	
Most Foul Smelling Wood of India	Most Sweet Smelling Wood of India
	
Wood Biodiversity	Model Of Wooden Propeller Shaft Of Ship
	
Wood Charcoal from Kalsi-3rd Century AD	Endemic woods of India

HIGH PROFILE VISITORS OF XYLARIUM

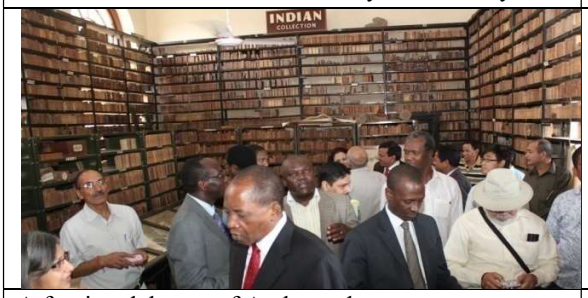
Prince Charles, United Kingdom



Mr.L.K.Advani, President, Bhartiya Janta Party

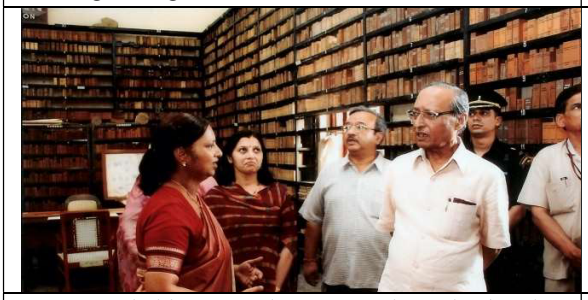


Mr. Sharad Panwar, President, NCP.



A foreign delegate of Ambassadors

World bank team



Dr. D.R. Shekhawat and Ms. J. Rathore, husband & daughter of Smt. Pratibha Patil, President of India.

Mr. Montek Singh Ahluwalia, Deputy Chairman, Planning Commission.

Ms. Shabhana Azmi during a visit of Joint Parliament Committee

Dr. T. Chatterjee, Secretary, Ministry of Environment & Forests.