Session 12

[Friday 1st period 1.0 hours - plenary]

Promoting wood culture in the future

Speakers

Speaker:
Gabriel Hemery

Topic:
Reviving Britain's lost wood culture

Speaker:
Yang Ping

Topic:
The promotion of wood culture in Japan

Speaker:
S C Joshi

Topic:
Forestry sector at crossroads in India

Reviving Britain's Lost Wood Culture

Gabriel Hemery[1]

Abstract

Britain is the second least-wooded country in Europe, having lost its woods after centuries of clearance for agriculture and economic development. Its people are disconnected from the concept of growing trees for wood, even though timber is Britain's sixth largest import. It is argued that there is a lost wood culture in Britain. A number of initiatives have been developed by the Sylva Foundation that together aim to recover Britain's wood culture by helping people to: understand more about sustainable woodland management; allow experts to have a say in policy development; develop a closer relationship for members of the public with trees; and, support and encourage woodland owners to undertake sustainable forest management.

Keywords: wood culture, Britain, education, society, sustainable forest management

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1. INTRODUCTION

1.1 Forest resources in Britain

Forest resource assessments for the UK indicate that the nation is the second-least wooded country in Europe, alongside the Republic of Moldova, with just 12% forest cover (UNECE 2011). Ireland and the Netherlands are equally the least-wooded countries in Europe, each with 11% forest cover, while there are four territories with less cover: Isle of Man (6%), Jersey (5%), Guernsey (3%) and Malta (1%). Some territories have 0% forest cover: Gibraltar, Holy See, Monaco, San Marino and Svalbard & Jan Mayen Islands. At the other extreme Finland is the most-wooded with 73% forest cover, while Sweden, Slovenia, Latvia and Estonia all exceed 50% forest cover (UNECE, 2011).

Within Britain, Scotland and Wales account for much woodland cover; England alone has proportionately the smallest forest area and the least state forest resource in Europe and yet is one of the most intensively used. Compared to the EU average there are over 66 times more people per hectare (ha) of state forest in England. (Forestry Commission, 2011).

An Enquiry on Private Forest Ownership in Europe revealed that on average, across 23 countries in Europe, 50.1% of forests were in public ownership compared to 49.6% in private ownership (UNECE/FAO/CEPF, 2007). Timber utilisation rates were higher in public forests than private forests in all nations except Bulgaria, France and Finland. Britain, in comparison to the rest of Europe, has a very low amount of publicly-owned forests at just 18%.

1.2 A lost wood culture

Despite having a low woodland cover, trees and woodlands nevertheless surround people in Britain, and wood remains important to everyone even though there are many substitute materials available.

In Britain today, people that access or view woodlands do so through a society that cherishes the beauty of the trees in the landscape and the wildlife it supports. Exercise and recreation is encouraged from picnic areas near roadsides, along signposted walks or mountain bike trails. Environmental membership-based NGOs boast of the wildlife value in our woods and celebrate their heritage, sometimes calling for more protection of forests or for more tree planting through magazines and websites. There is little mention of the production of wood in these communications.

It is well known in Britain that woodland owners and foresters can experience considerable negativity from members of the public in response to woodland management or tree felling. Such reactions raise two important questions: (1) the level of understanding among the public about forestry; and suggest (2) a more fundamental question surrounding the culture of growing trees for wood.

In terms of public attitudes to forestry (Q1), the forestry profession has not been always the best advocate. Wood was once the principle material for society but with the reduction of Britain's forest cover to an all time low (5%) at the end of the 19th Century, which coincided with the relentless substitution of wood by manmade materials, we lost our connection with growing trees for wood. The response of the forestry sector was the bold afforestation of the uplands of Britain. With hindsight it is easy to criticise the planting of mono-cultured rows of

alien conifers that took place in the early and mid 20th Century, scarring some of Britain's most valued landscapes, burying precious archaeological heritage, and damaging precious habitats. These activities resulted in a doubling of woodland cover in Britain but this came at a cost to the goodwill of the public. It is my view that forestry is still tarred with this brush today, some 40 years since large scale coniferous afforestation virtually ceased in the UK.

In relation to the culture of growing trees for wood (2), comparisons can be made with rearing livestock in modern farming, although an important difference is that the unsightly aspects of production, particularly slaughter, are hidden from view. The strongest example would be the production of lamb: the joyous antics of the lamb at Springtime attract thousands of members of the public to 'lambing days' on farms and where fields of new born lambs in the countryside attract admiring comments from the public. These same lambs will be culled for the table within a year but this is never mentioned, never witnessed; perhaps out of sight - out of mind. Contrast this with the public nature of woodland management, where the sound of chainsaw and sight of vehicles among the trees may instantly raise the fears and anger of local people.

Yet wood is as popular as ever in modern society as sales boom for 'real wood' flooring and kitchen cabinets, and supply of wood burning stoves has failed to meet demand in recent winters as more and more people aim to cut their energy bills. How can this demand be reconciled with the public's at best, antipathy, and at worst negativity to woodland management? Perhaps a main factor is the certainty that many people will never have considered where the wood they are using may have come from; there is no connection between the wood and a forest of trees in the mind.

A new purpose for forestry is emerging, centred on a role for trees in soaking up carbon dioxide, and in protecting society from environmental damage such as flooding (so called 'ecosystem services'). Increasing concerns about the importation of timbers from endangered forests, especially in the tropics, has leads to certification schemes providing certainty that the wood is sustainably sourced. The concepts of 'wood miles' and 'wood security' are as yet muted but it is likely that in the near future the benefits of home-grown wood may become more apparent. Recent evidence has shown that lack of management may adversely affected woodland biodiversity. To meet all these challenges and opportunities, some form of management of our tree resources will be required. Perhaps the greatest challenge is communicating these to both the public and professionals.

2. EXAMPLES OF WOOD CULTURE INITIATIVES

A number of initiatives aimed at tackling these issues have been developed by the Sylva Foundation (www.SYLVA.org.uk); a tree and forestry charity based in the UK. These provide some case studies highlighting the challenges and difficulties in connection with:

1. the perceived public disconnection with growing trees for wood;
2. giving professionals and the public a voice in developing forestry policy; and,
3. the practical difficulties of reconnecting the woodchain in Britain, with its fragmented woodland ownership structures and disconnected wood-based sector.

2.1 Public perceptions on growing trees for wood

In addition to the issues highlighted in the overview above it is clear that a key difficulty in communicating the benefits of sustainable forest management is the complexity of forestry, both in practice and theory. How can the felling of a tree that took three human generations to mature (e.g. 120-150 years for oak) be sustainable? Why do all the trees in an area have to be felled together? Why not fell a tree that had died naturally or was dangerous?

These are most the common questions by members of the public in response to an education initiative run by Sylva, the OneOak project (www.OneOak.info). A mature oak tree, which turned out to be 222 years old, was felled in a plantation grown on the famous Blenheim Estate in Oxfordshire, England. Its felling was witnessed by 450 people who were invited to the woodland, including 250 children, and recorded in detail on film and camera. These activities and all those that have followed to date, such as the milling at a sawmill, replanting at the woodland a year later, and work by wood workers, are being used in a series of exhibitions travelling Britain and broadcast in the media and on the dedicated project website. Sylva have set out to marry science and art in telling the story of sustainable forest management by focussing on the life of a single tree. The science activities have provided detailed information about the tree's age and growth through dendrochronology, a laser scan before felling provided a 3D model of the tree and its precise volume, while a massive effort to weigh every stem, branch and twig after felling provided information on the weight of the tree and ultimately its carbon content (Hemery and Morison, 2010). Dozens of artists have depicted the tree in various art forms, while many more woodworkers have started using the tree's timber to make a wide variety of objects. While the main timbers are still awaiting drying to make them usable for furniture and joinery, already the green (wet) wood has been used in sculpture, in turning and carving, for outdoor furniture and house construction, and even the sawdust has been used in the kitchen of a Michelin-rated restaurant to smoke salmon.

The public exhibitions held to date have provided a platform for Sylva's staff to talk with the public about the concept of growing trees for wood. It is their experience that many people admit, when challenged, that they have a lot of wood in their lives; in their offices and homes. However, many will also admit to never having considered the origins of this timber, either geographically (i.e. homegrown or imported) although reasonable knowledge exists of certification schemes (particularly FSC), and few may have connected their use of wood with the felling of trees in woodland. The graphically potent film and images of the OneOak tree's felling provokes strong emotions and stimulates much debate at the exhibitions. Although data is only anecdotal, it has been clearly evident that for many people they have not been stimulated to think about growing trees for wood in any detail before. It has also been evident that for some, admittedly very few, the very notion of felling a tree with a productive intent, is simply very wrong. When challenged to think about how important wood is to modern society, including in their lives, some people have steadfastly objected to the very notion of felling a tree. Among this minority, there has been a view that only trees that have died naturally should be used by man.The OneOak project has been a small initiative with limited geographic impact. It is obvious that there remains a major communication task to help members of the public understand the sustainable nature of forest management. The diversity of its gifts to society and the environment, are at the same time the complexity causing the lack of understanding by members of the public.

2.2 Giving stakeholders a voice in developing policy

Evidence-based policy-making came to the fore in medicine and has made slow progress into other disciplines. There are many barriers to policy makers being well-briefed, including the difficulties of accessing relevant material, while the distance at which experts can advise and comment can further hinder good decision making. The concept of allowing experts and interest groups to inform policy can be challenging and difficult to achieve practically.

A novel research project by a Graduate student at the University of Oxford, supported by Sylva, set out to identify the top-ranking research priorities relating to forestry in Britain according to experts and stakeholders (the Top Ten Questions for Forestry project or T10Q). An online survey was promoted across a very wide membership, not only commercial foresters but among scientists, conservationists and woodland owners (Petrokofsky et al., 2008). A second phase brought a group of experts together in a workshop to review, rank and condense the questions.

A total of 481 people responded to the first phase survey, submitting 1594 questions, while the workshop was attended by 51 people (Petrokofsky et al., 2010). The first ranked question was "What are the most technically and financially effective ways of identifying, monitoring and controlling invasive species, pests and disease?". The second ranked question "How can we achieve better understanding between foresters and other parts of society?". The high rank of this issue was a surprise to many of those attending the workshop.

The resulting top ten questions have raised considerable interest among the sector in Britain, and while the notion of a participatory process in setting research or policy agendas was initially quite challenging for policy makers, the concept is now viewed positively.

2.3 Engaging the public in citizen science

Volunteers have been encouraged to join a new initiative called TreeWatch with the aim of keeping a watchful eye on the health and vitality of trees across Europe (www.TreeWatch.com). TreeWatch is a citizen science project run by the Sylva Foundation with partners, including Earth Watch, Forest Research, Royal Horticultural Society, and the Tree Council. It aims to monitor the health of trees, while also engaging people with trees and the environment.

Our trees and woodlands are increasingly under threat from pests & diseases. Climate change is helping new tree pests & diseases to survive and thrive, while the global trade in plants is spreading new pests & diseases. Keeping track of existing and new threats to trees is expensive; and scientists are increasingly stretched and underfunded.

Volunteers are encouraged to 'adopt a tree' of any species, anywhere. It can be in a volunteer's garden, in their local street or park, or in the countryside. Volunteers can plot their tree on an online map and provide basic information about it, such as its size and history if known. They are then invited to take part in an annual survey of all adopted trees, whilst specific surveys are run from time to time. For example the 2011 surveys were studying horse chestnut leaf miner and European pear rust.

TreeWatch is not a project that focuses solely on trees with a view to the production of wood. It has been developed specifically with a view to broadening the subject of trees and

environmental change to a wider audience than Sylva's other initiatives. It is hoped that it will encourage people to explore their local environment, whether urban forest or wild wood, and thereby start to build a closer relationship with trees and forests.

2.4 Encouraging sustainable forest management

Woodland owners find that management of their trees is sometimes prohibitively expensive. An increase in hobby or leisure ownership means that woodlands are less often considered to be a wood resource, and more often a place for recreation or long term investment in land value. There are an estimated 100,000+ woodland owners in Britain, and some 649,000 hectares of woodlands in England alone without a management plan[2]. The absence of a Government-supported management plan does not of course necessarily mean that a woodland is not being managed, however it is a strong indicator of the likelihood of a lack of management; and the area is staggering.

In an interesting move, in 2009 13 of the UK's eminent environmental NGOs, representing 8.3 million members and 690,000 ha of land, issued a joint statement calling for more woodlands to be brought into sustainable forest management with the aim of halting declining woodland biodiversity[3]. This is a powerful argument for woodland management for informing members of the public about the benefits of sustainable management, as it dispels the common myth that woodlands are natural and wild in England.

In 2010 the Sylva Foundation launched “myForest” as a web-based service to support woodland owners and wood using businesses across Britain, with the aim of reconnecting the wood chain www.myForest.org.uk. It has the ambitious aim of identifying woodland owners and encouraging woodland management across Britain, by providing online woodland mapping tools for owners, and a management planning template that is closely aligned with Government grants, should the owner wish to link to the regulatory framework. It also provides a wood marketing platform and a directory of businesses. Woodland owners are provided with a library of information about woodland management and linked to local woodland initiatives that can provide practical support, where available.

Eighteen months following the launch of myForest it has gathered 388 woodland owners of 528 woodlands, totalling 8544 ha in area. This is an encouraging start especially when the effectiveness of the service is reliant on uptake by neighbouring owners and wood-related businesses, and therefore its effectiveness before wider uptake is limited. Sylva have found that a number of regional and local initiatives have been keen to adopt myForest as a specific tool for an area (e.g. Chilterns Woodland Project[4], Ward Forester in Devon[5]).

A wide variety and scale of woodlands have been signed up to the myForest service, from a 3000 ha country estate, to small hobby woodlands of 1 ha or less; the average being 16 ha. A real measure of success will be not only the mapping and mensuration of the woodlands, but the number of management plans produced (and therefore woodlands brought into good condition), and volume of home-grown wood products mobilised.

[2] Pers. Comm. Head of Woodland Surveys, Forestry Commission. National Inventory of Woodlands and Trees – England.
[3] http://www.wcl.org.uk/docs/2009/Link_position_statement_Woodfuel_Strategy_03Jul09.pdf
[4] http://www.chilternsaonb.org/caring/woodlands_project.html
[5] http://wardforester.co.uk

3. DISCUSSION AND CONCLUSIONS

Four separate initiatives led by the Sylva Foundation have been described that together aim to help people to: understand more about sustainable woodland management; allow experts to have a say in policy development; develop a closer relationship for members of the public with trees; and, support and encourage woodland owners to undertake sustainable forest management. These are relatively small in scale and yet the task of recovering a wood culture in Britain is immensely challenging.

Larger scale projects would be beneficial to achieve greater impact given that the public is increasingly suffering from 'nature deficit disorder' (Louv, 2010). To achieve this scale of impact it is likely that collaboration between the numerous actors in the wood-related sector will need to occur. If this were between those traditionally seen as having contrasting standpoints then this could be particularly effective.

Changes at the strategic level to forestry practise may be beneficial. For instance, the practise of clear felling is often central to any difficulties of public perception towards forestry. At the same time the perceived threat from climate change suggests that our forests would benefit from being more diverse in structure and species diversity. Adopting close to nature forestry practice (for example continuous cover or group selection systems) would minimise landscape and environmental impact, thereby minimising public ill-feeling towards forestry, while leading to more robust forests.

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SYLVA
FOUNDATION
Recovering Britain's wood culture
Dr Gabriel Hemery FICFor

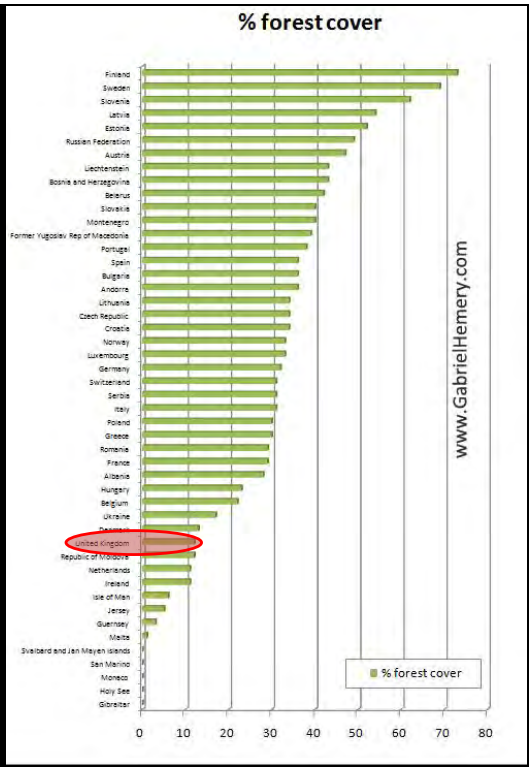

SYLVA
FOUNDATION
Forestry HORIZONS.EU
TreeWatch
myForest
linking the woodchain
www.OneOak.info

Overview

1. Britain's tree resources
2. Wood culture issues
3. Wood culture initiatives
4. Final thoughts

Britain's tree resources

2nd least-wooded



Wood culture issues

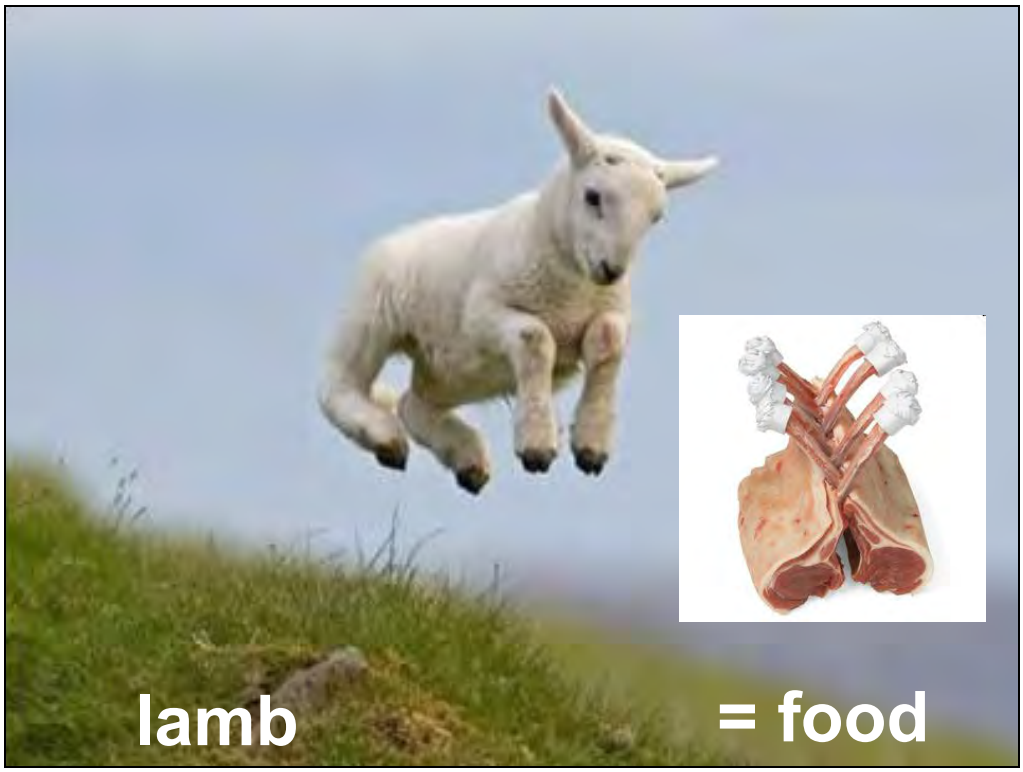
Woodlands and ownership ...


2/3 neglected
82% private ownership
63,000 owners


General public ...

“Forestry”

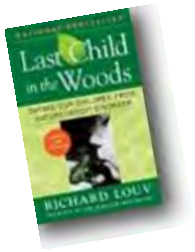
- Environmental damage from plantation forestry
- Exploitation of ‘natural’ woodlands
- Tropical deforestation




tree
= wood


tree (+ felling) = wood

“Nature Deficit Disorder”



Sustainable Forestry

“ ... the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems”

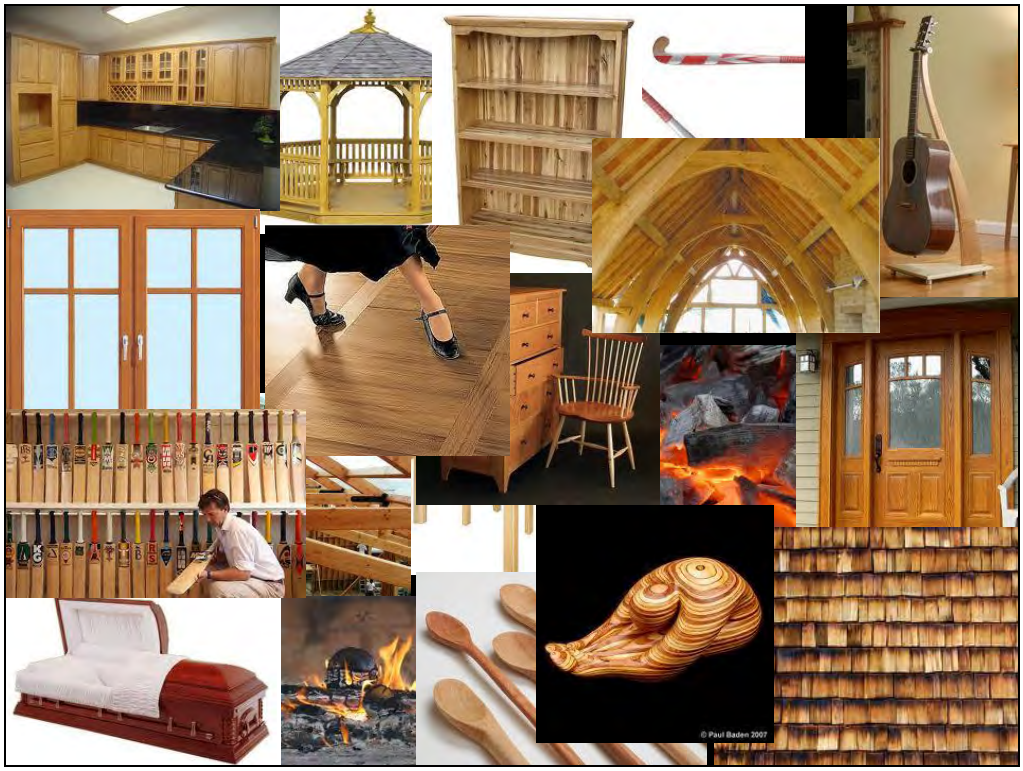
The BIG *Question* ...

How can cutting down a 100+ year old tree be ...

***sustainable*?**


TREE O' CLOCK
HELP US PLANT A WORLD RECORD
05.12.09


National
Cut Down a Tree for Timber
Week
Bring your own saw.
Watch the tree die!



Wood culture initiatives

SYLVA FOUNDATION

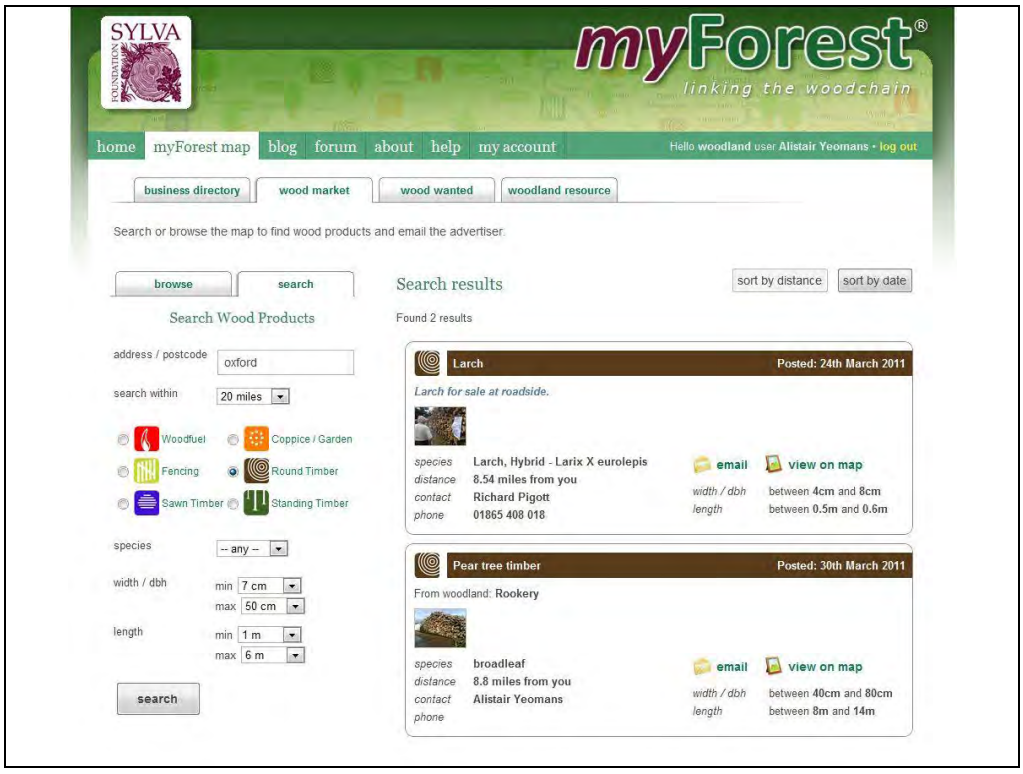
Giving stakeholders a voice in policy

- 1594 questions from 400 respondents
- Top ten questions for forestry research (T10Q)
- Peer review papers

Engaging the public in citizen science

- "Adopt a tree"
- **Google map-based:** www.TreeWatch.com
- **Education + Science**

Encouraging sustainable forest management



www.myForest.org.uk

- **Woodland mapping and inventories**
  - 9000 hectares / 400 woodland owners

www.myForest.org.uk

- Woodland mapping and inventory
- **Woodland management plans**
  - EU Common Agricultural Policy reform

www.myForest.org.uk

- Woodland mapping and inventory
- Woodland management plans
- **Wood marketing**
- ***Featured in State of World's Forests 2011***

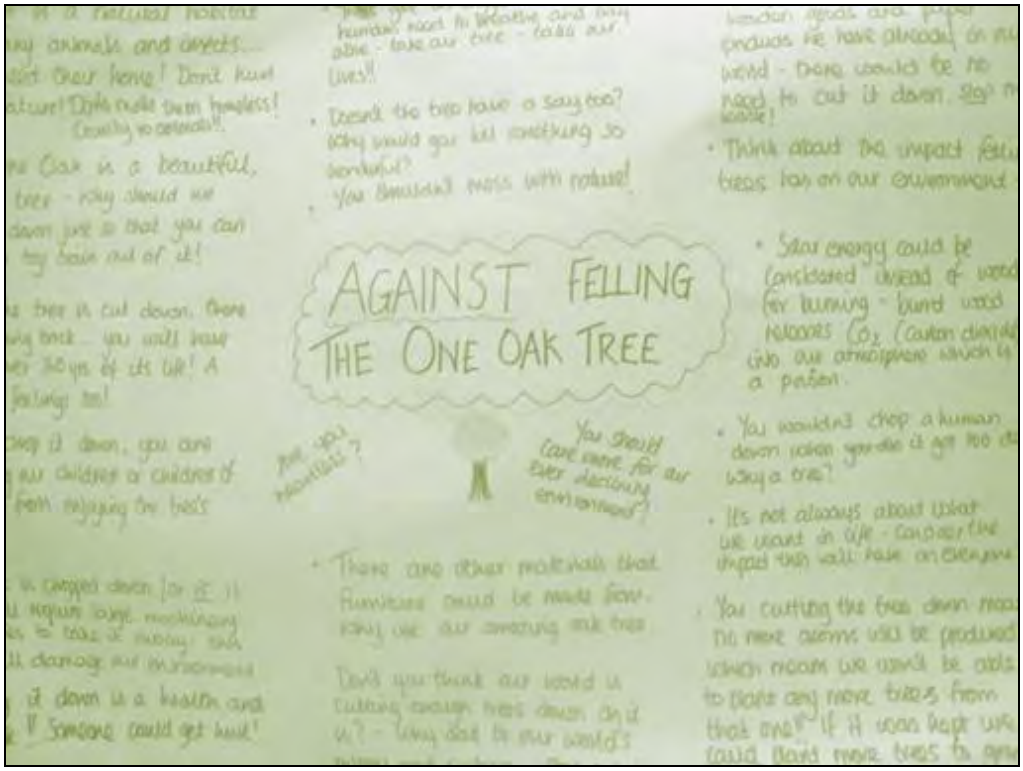
Public perceptions on growing trees for wood

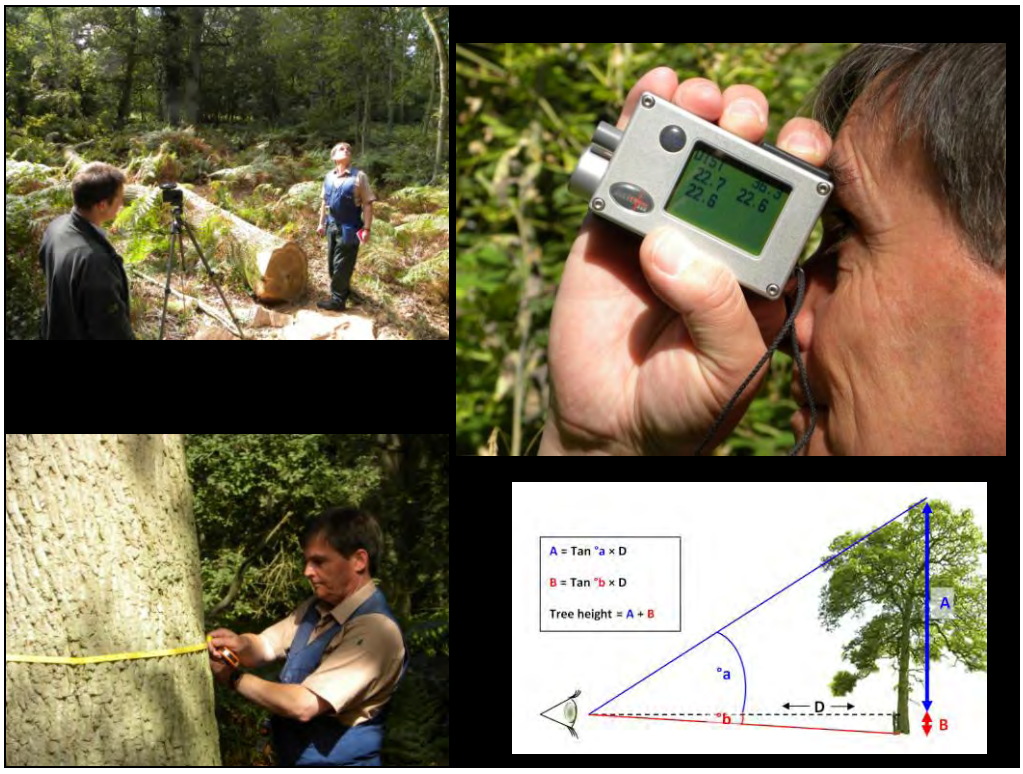
www.OneOak.info


Following the full life story of one oak tree
www.OneOak.info
BLENHEIM PALACE

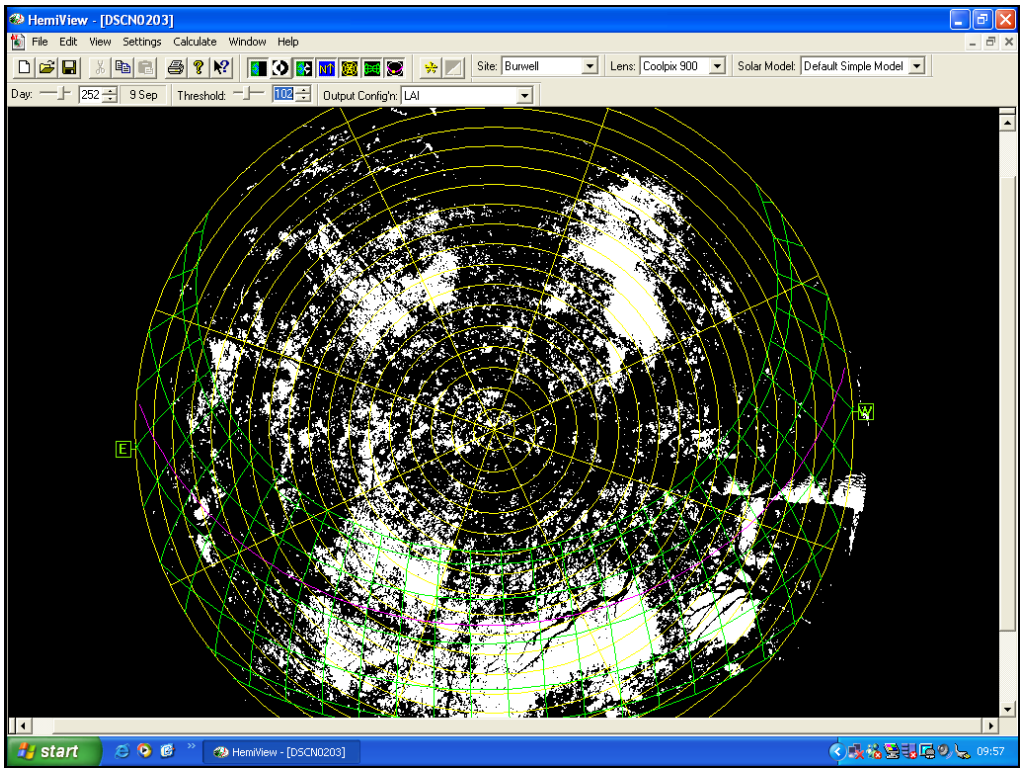

E


Meet
OneOak
www.OneOak.info
The tree casts shade on all
Even upon the woodcutter
(Hindustani proverb)
Draw your own picture of O


AGAINST FELLING
THE ONE OAK TREE


A = Tan °a x D
B = Tan °b x D
Tree height = A + B
°a
°b
D
A
B


www.OneOak.info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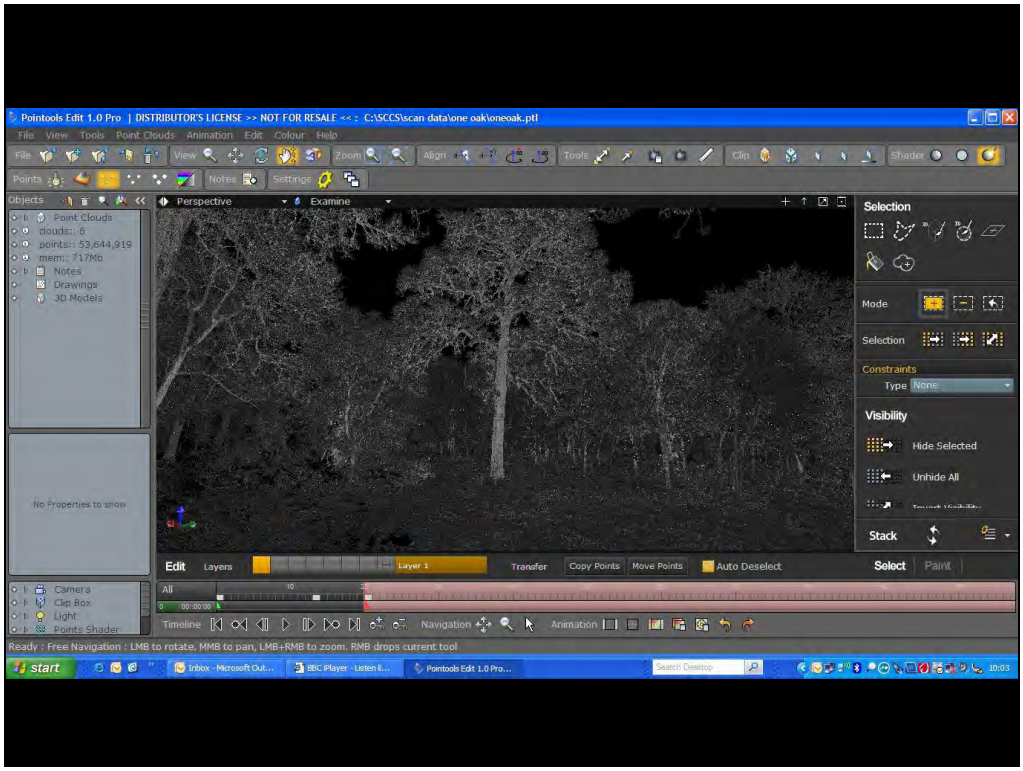
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Constraints
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Hide Selected
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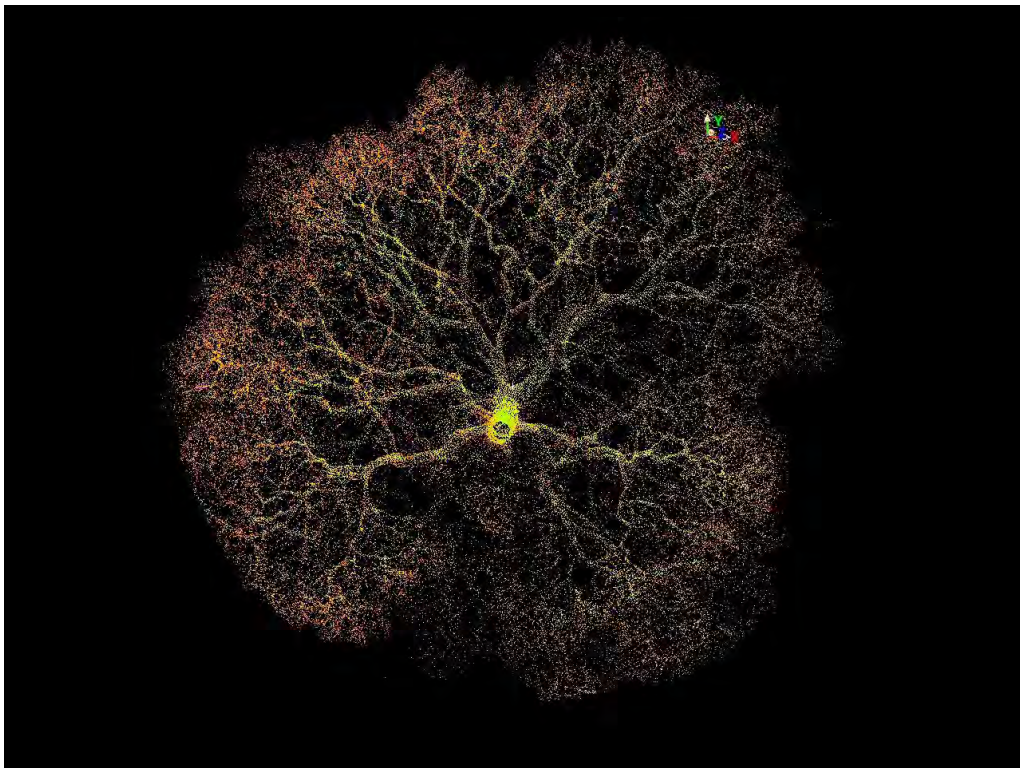
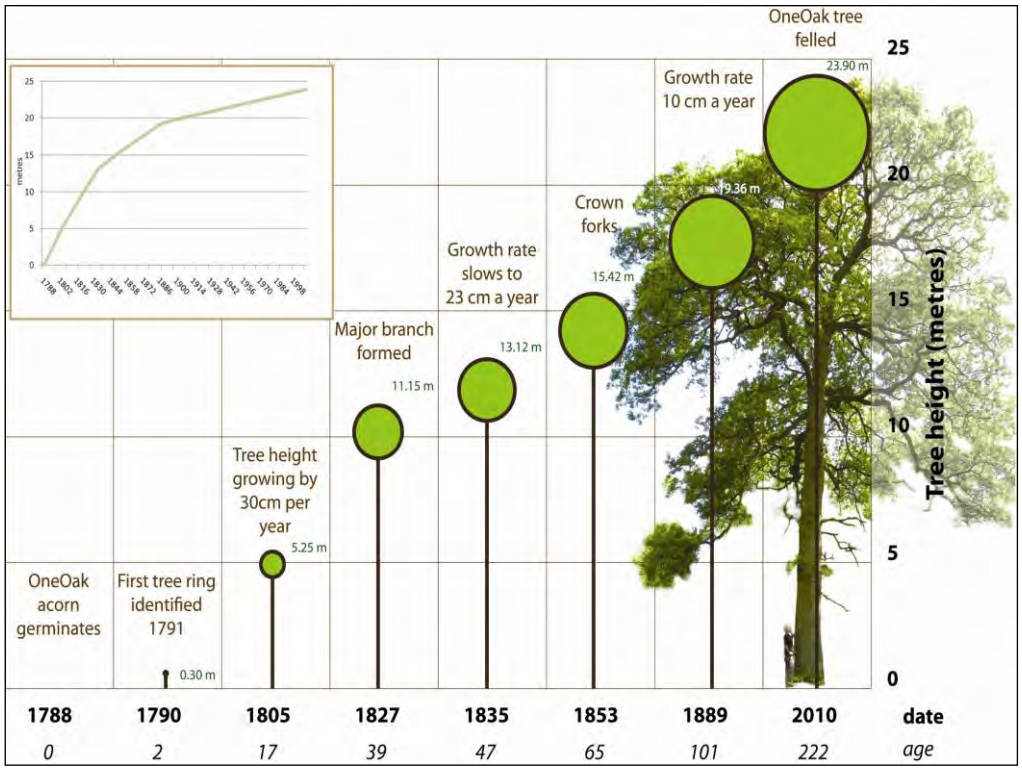
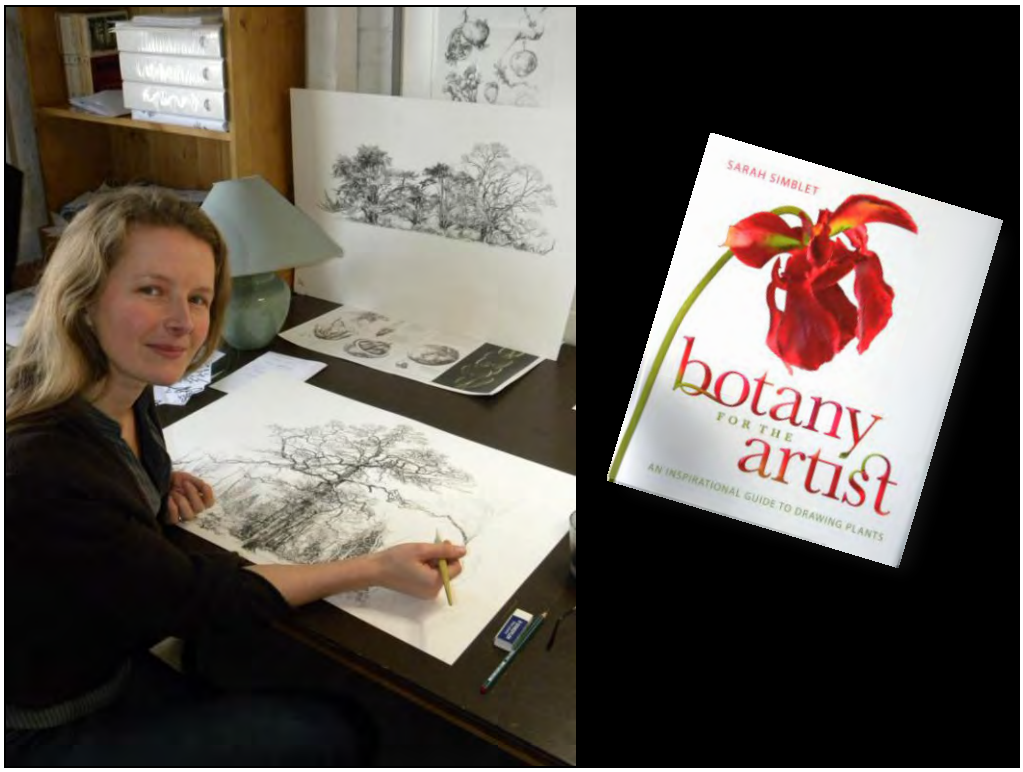
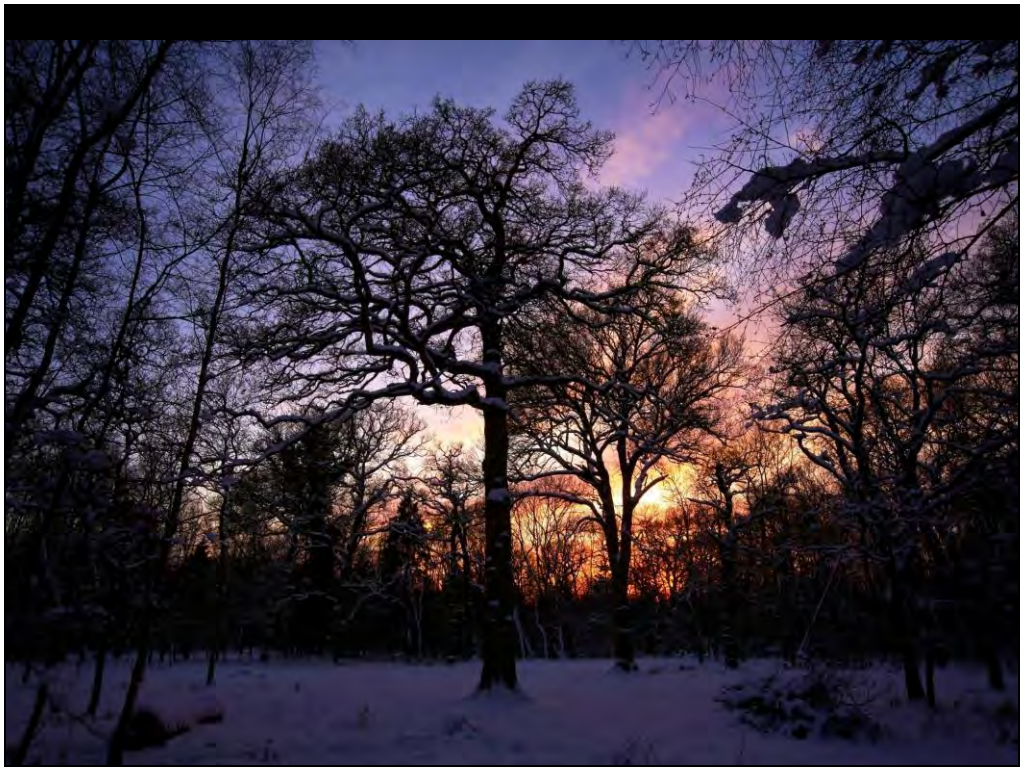



OneOak tree felled
23.90 m
Growth rate 10 cm a year
19.36 m
Crown forks
15.42 m
Growth rate slows to 23 cm a year
13.12 m
Major branch formed
11.15 m
Tree height growing by 30cm per year
5.25 m
OneOak acorn germinates
First tree ring identified 1791
0.30 m
25
20
15
10
5
0
Tree height (metres)
1788
1790
1805
1827
1835
1853
1889
2010
date
0
2
17
39
47
65
101
222
age

14,385 kg

3.93 tonnes C


SARAH SIMBLET
botany
FOR THE
artist
AN INSPIRATIONAL GUIDE TO DRAWING PLANTS



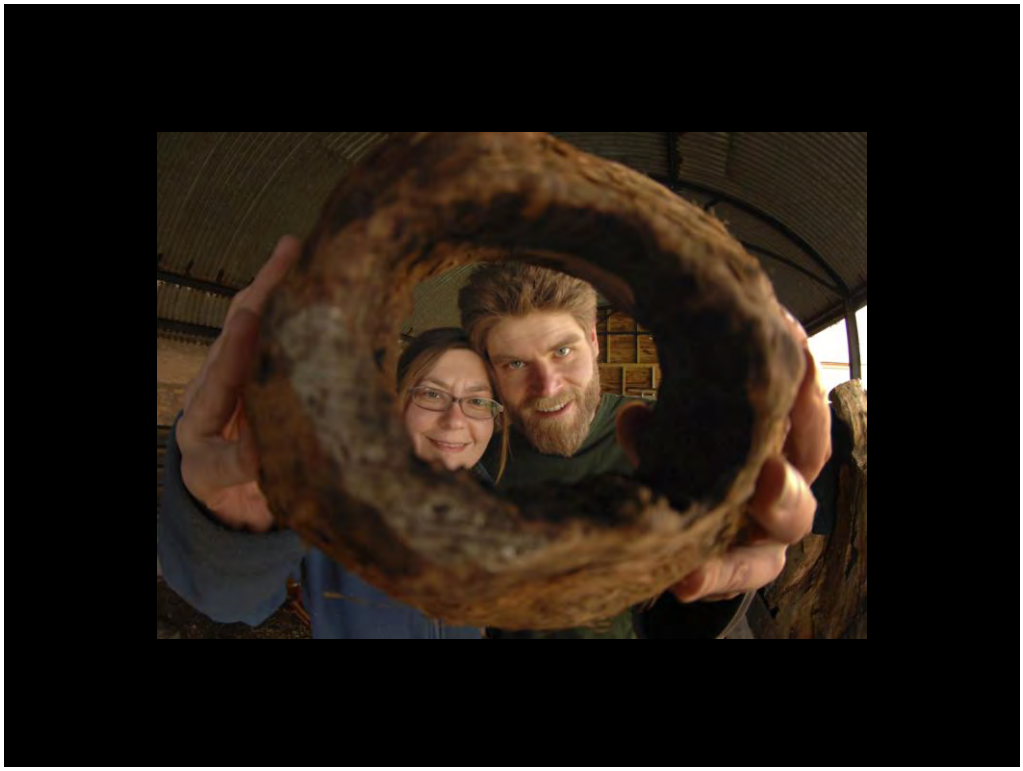

STIHL


PALFINGER


DEEP IN WOOD


OXFORD
& CHERWELL VALLEY
COLLEGE


THE FINAL DESIGN



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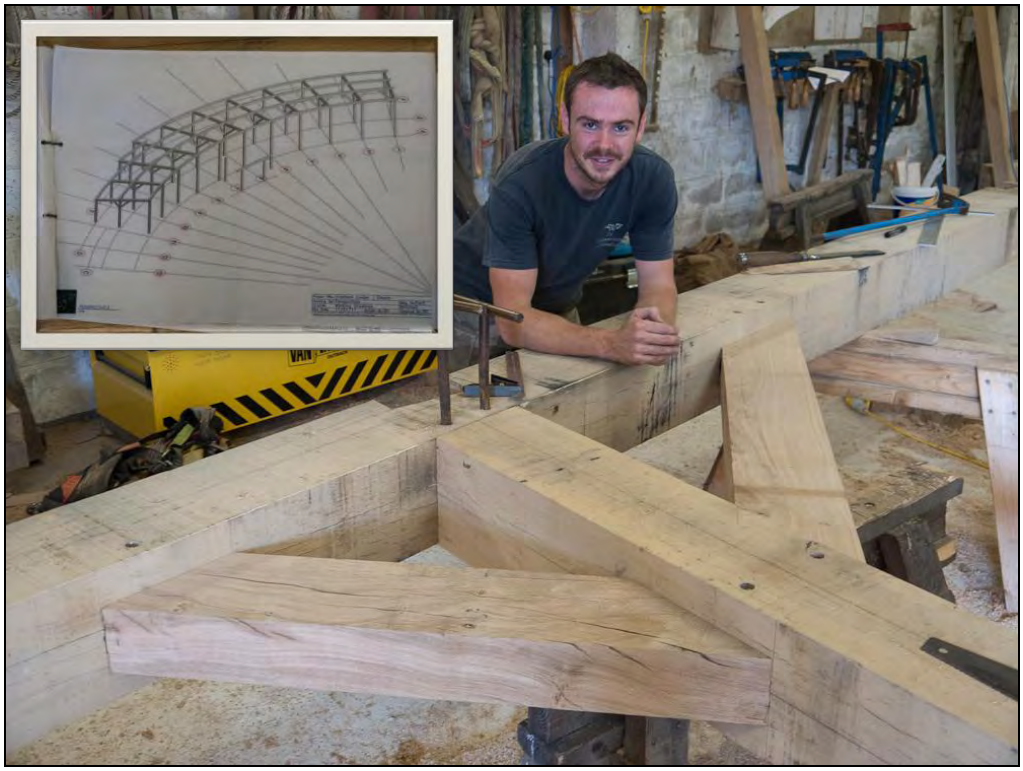
AUX QUAT'SAISONS



Website

- Film
- Music
- Photos
- Blog

Exhibitions

Media

Book

Talks

Final thoughts ...

- **Trees and forests will only increase in importance (*e.g.* Bioeconomy, climate change, ecosystem services)**
- **"Nature deficit disorder" an increasing problem if it stifles innovation and activity**
- **Trees precede civilisation, deserts follow ...**
- **... But not with *Sustainable Forest Management***
- **Recovering a Wood culture**

= rebuilding understanding and trust

The promotion of Wood Culture in Japan

Yang Ping[1]

Abstract

This report describes the promotion of wood culture and educational movements in Japan, which was advocated by the Japanese cabinet as a national strategy intended to inspire all citizens to appreciate wood culture and wood products. Wood educational programs emphasize the multi-step approaches from enjoying woodworking experience to deepening understanding of the benefits of using wood and expanding the creativity in effective use of wood. The establishment of learning programs is targeted towards schools and communities for lifelong education. Such wood culture and educational activities are expected to have a great impact in Japan.

Keywords: wood culture, wood education.

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1. INTRODUCTION

In 2006, a Japanese cabinet decision set forth the national strategy of wood education in the Basic Plan of Forest and Forestry (Japanese Agriculture Ministry, 2006). In order to organize the large scale campaign of wood education systematically, the national institution, Japan Wood-Products Information & Research Center, has taken the lead in collaborating with various social groups. With the aim of encouraging all citizens to appreciate wood culture through lifelong learning so as to deepen the understanding of wood properties, especially realizing the meaning of wood utilization, this nationwide educational movement has been extended to local communities. Its main emphasis is focused on the three multi-step approaches described as touching with sensitivity, making with understanding, and learning through application, respectively. The detailed efforts in promoting wood education in Japan are dealt with in this report, such as the development of wood educational programs and teaching materials, implementation of forums, workshops, wood education instructor trainings, regional wood educational activities, and an All-Japan Championship of Woodworking Skills for Junior High School Students.

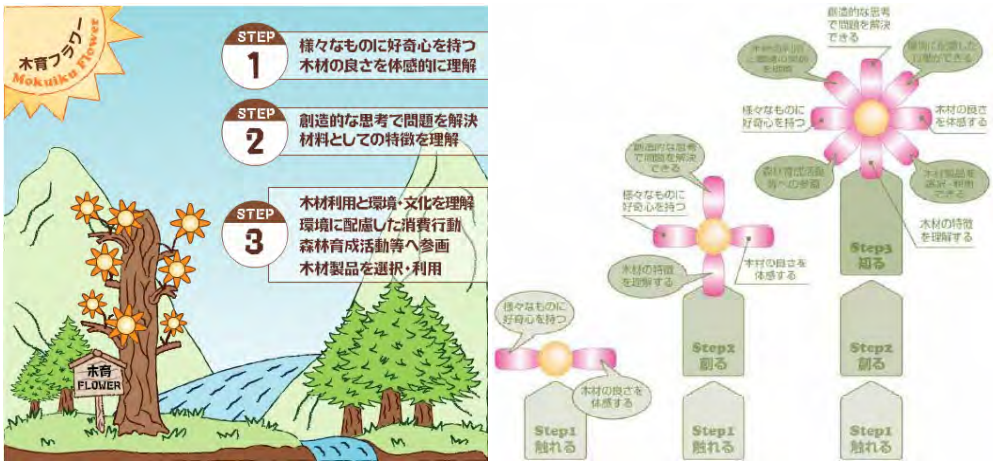


Figure 1 Image of wood education flowering in three stepwise approaches

2. EFFORTS IN PROMOTING WOOD EDUCATION

2.1 Development of wood educational programs and teaching material

To improve citizens' wood cultural awareness from the early age, a series of wood educational programs and teaching materials have been developed for children in accordance with the three multi-step approaches of wood education and their specific goals. Sensual activities like feeling wood benefits, enjoying wood amenities, and taking part in wood culture excursions are designed for the first step. Producing activities such as making annual ring puzzle, tissue box and bookshelf are developed for the second step. Learning activities for better understanding the properties of wood such as lessons on carbon storage and experiments of thermal conductivity are planned for the third step. Figures 2 to 4 are some concrete plans in three different phases of wood educational activities, the tips of each plan include time required, target learners, key words, summary and features, examples and goals, relationships with other steps, effective implementation cases, matters to be attended to,

preparation of materials and tools required. Various study units such as wood structure (Figure 5), wooden temple (Figure 6), energy comparison, prevention of global warming, and renewable resource etc, are also included in wood education service package (Japan Wood-Products Information & Research Center, 2009). Additionally, the user manual of woodworking tools including saw, planer, gimlet, hammer, etc. (Figure 7) is also contained in the teaching materials. These are edited with a variety of pictures and illustration for children to easily imagine and understand the proper and safe ways in using tools. All teaching materials can be downloaded from the website of Japan Wood Products Information & Research Center.

Figure 2 Wood culture excursion activity

Figure 3 Activities of making wooden objects

Figure 4 Teaching materials of wood orthotropic properties

Figure 5 Teaching materials of wood structure

Figure 6 Japanese traditional wooden temples

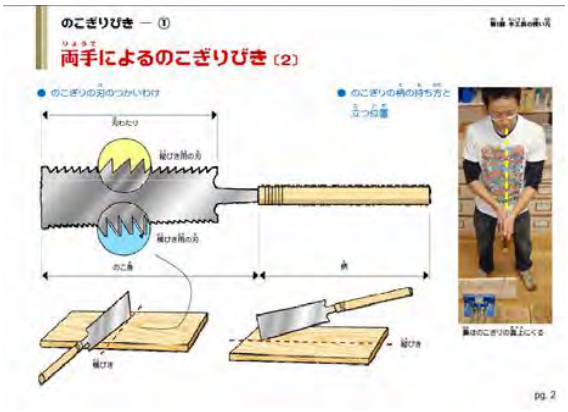


Figure 7 User manual of various woodworking tools

2.2 Wood education forums, workshops and wood education instructors training

In order to achieve the goals of wood education nationwide, efforts have been made to establish a powerful platform for people to exchange information on wood education. Under the leadership of the Japan Wood-Products Information & Research Center, regional wood education forums and workshops have been held nationwide. Additionally, these events were followed with instructors training including lectures on wood education, practice of woodworking, individual final action plan presentation, and training certificate delivery ceremony.

To promote instructors' ability in wood education planning, preparation and implementation, a two day training program covers the following curriculum:

- Lecture on the social mission of the wood education instructor
- Lecture on planning of wood educational activities
- Lecture on implementation of wood educational activities in details
- Lecture on essential knowledge and skills of wood education instructor
- Guidance of safe operation
- Experiments on wood science and its environmental characteristics
- Practical guidance of wood education
- Practical planning of wood education activities
- Woodworking skills training

A variety of trainees have participated the training course, including university students, in-service teachers, employees in public or private sectors and some housewives. The final task for trainees is the presentation of a detailed wood education plan for a group of twenty elementary school fifth graders in a local community hall furnished with tables. The duration is set as two hours and takes place for three consecutive Saturdays. However, the available costs for materials should be less than 1,000 Japanese yen. Up until the present time, over one hundred participants throughout the country have received certification as qulified wood education instructors. This plays an important role creating an appeal to a large public so as to gain a social consensus of wood education nationwide. The Japan Wood-Products Information & Research Center has supported these regional wood edcation plan financially.

2.3 Regional wood educational activities

To encourage children's interest towards wood, a fascinating opportunity for them to enjoy wood hands-on activities (Ping, Y, and Hirotsugu, T, 2009) has been provided every year since 2005. The application of shape memory characteristics of wood is the key of the workshop. The porous structure of wood enables a large compressed deformation perpendicular to the grain without the occurrence of failure in wood cell wall when it is loaded after softening enough in hydrothermal state with high moisture and temperature. Such compressed deformation can be fixed temporarily under loading and drying (drying set) (Masafumi, I, et al., 1993). However, deformation would disappear completely when it is placed in hydrothermal state again. This feature of so-called shape memory characteristics of wood under hydrothermal action is illustrated in Figure 8.

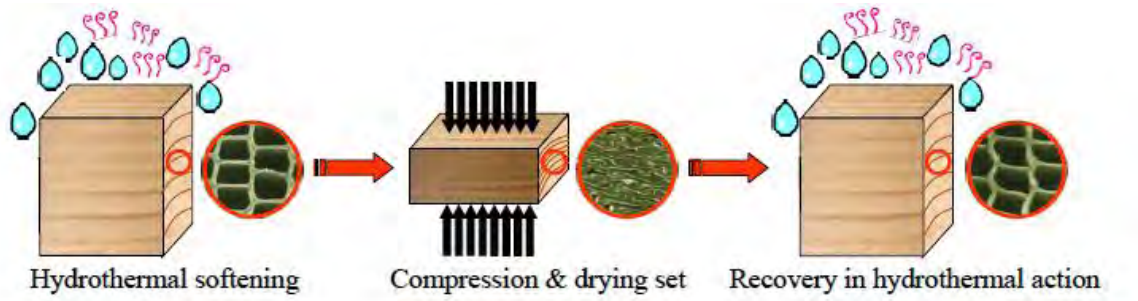
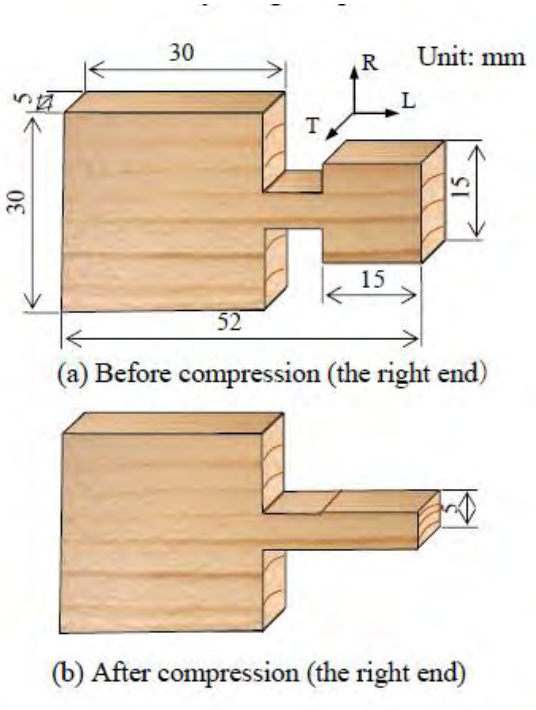


Figure 8 Schema of shape memory characteristics of wood

Activities for kindergartener or lower grades of elementary school accessory involve harnessing such unique hydrothermal features of wood. The compressed wood piece (Figure 9) was prepared at a size designed for making a strap in 5 mm thick along tangential direction (T), 30 mm wide along radial direction (R), and 52 mm long along longitudinal direction (L). Its left end, at 30 mm by 30 mm square area, was designed for children to draw what they like, which would be shaped out later to their favourite figure. In advance, after boiling in water for twenty minutes when moisture content rose to around 40%, the right end was compressed along the radial direction from 15 mm to 5 mm by using a vise, i.e., the compression ratio (C) was taken to be two-thirds (66.7 %) as set before. Then keeping it in air-drying naturally for one week until it reached the equilibrium moisture content around 15%, the compression end was ground into a round bar in diameter of 5mm. This compressed end could be put into the hole of a five Japanese Yen coin or a wooden ring, then immersing it into the hot water to recover it to the original dimension. Finally, the recovered end would not be able to be extracted from the coin or wooden ring any more. Figure 10 shows the variety of accessories made by using compressed wood.



(left) Figure 9 Compressed wood piece for making accessory

(right) Figure 10 Compressed wood accessories

Figure 11 Timetable board samples and works of elementary higher graders

On the other hand, the object for upper graders in elementary school was to make a timetable board as shown in Figure 11. The rotating weekday pointer is designed to apply the shape memory characteristics of wood. We can imagine the fulfilment and enjoyment from children smiling (Figure 12). Such kinds of amazing experiences at an early age are necessary to inspire children to become wood enthusiasts.

Figure 12 Enjoyment of Children in making activities

2.4 All-Japan championship of woodworking skills for junior high students

Furthermore, remarkable achievements of wood education in Japan have also been reflected in annual nationwide woodworking championship for junior high school students (Division of Materials and Processing, the Japan Society of Technology Education, 2009). This event has been held for eleven years. About twenty players take part in final event each year, having been are winners from eight regional tournaments (Figure 12). They are challenged

with given materials and tools for a four hour period. This “idea-to-product” competition evolves students fully engaged in wood education.

Figure 13 Scene in All-Japan championship of woodworking skills for junior high students

The judge’s evaluation was focused on skills, attitude, precision, creativity, and presentation impact. Ten high-ranking challengers were awarded by the Minister of Education, Welfare, Forestry, and some presidents of educational associations. Figure 13 shows the award ceremony and reports from mass media. We can expect the ripple effect of wood education on the society nationwide.

Figure 13 Reports on All-Japan championship of woodworking skills for junior high students

3. CONCLUSIONS

Recently much promotion of wood education with diversified collaboration has been carried out in Japan. This national strategic enlightening movement was systematically designed in multi-step approaches and with goals devised accordantly. The wood educational environment has been established by developing of a series wood education teaching materials for social sharing, the implementation of wood education forums, workshops, and instructor trainings. These provide citizens, especially children, with various opportunities to take part in activities with wood and to enjoy wood culture, thus deepening their understanding of the wood properties and advantages, the environmental significance of using wood. Encouragingly, the annual All-Japan championship of woodworking skills for

junior high students demonstrates successful wood education results, which plays a great role in cultivating wood enthusiasts for a mass of green consumers to secure global sustainable development in the future.

4. REFERENCES

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Ping, Y, and Hirotsugu, T, 2009, Application of shape memory characteristics of wood in making things workshop, Journal of the Japan Society of Technology Education, 51(3), pp 203-210.

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Division of Materials and Processing, the Japan Society of Technology Education, 2009, Report of the Eighth All-Japan championship of woodworking skills for Junior High School Students, pp 1-54.

The Promotion of Wood Culture in Japan

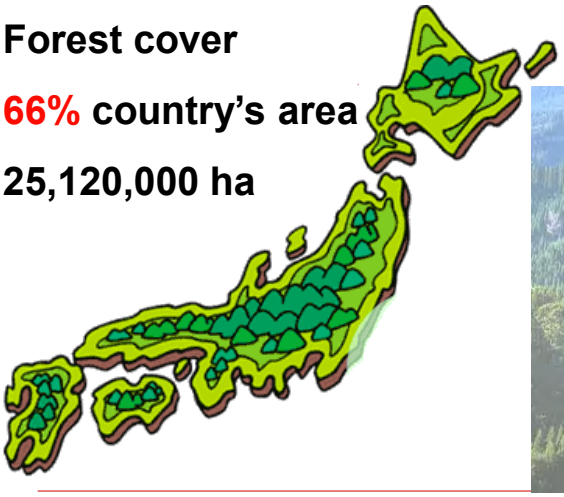
Yang Ping
Kumamoto University
Japan

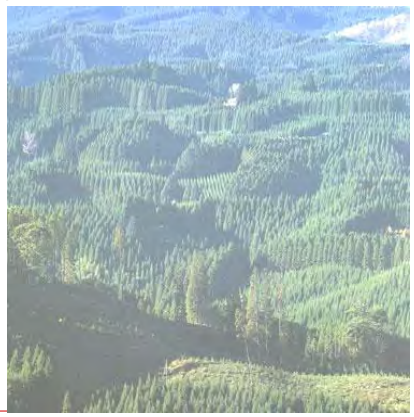
Abundant in forest resource

Forest cover

66% country's area

25,120,000 ha





Supporting rich and unique Japanese wood cultural heritage

Japanese wood cultural heritage

Wooden relics

Traditional temples, shrines

Religious statues

Movement of wood education in Japan

- To appreciate wood benefits
  - ecological material
  - renewable resource
  - green amenities for human being
- Promotion of wood culture and wood education in Japan

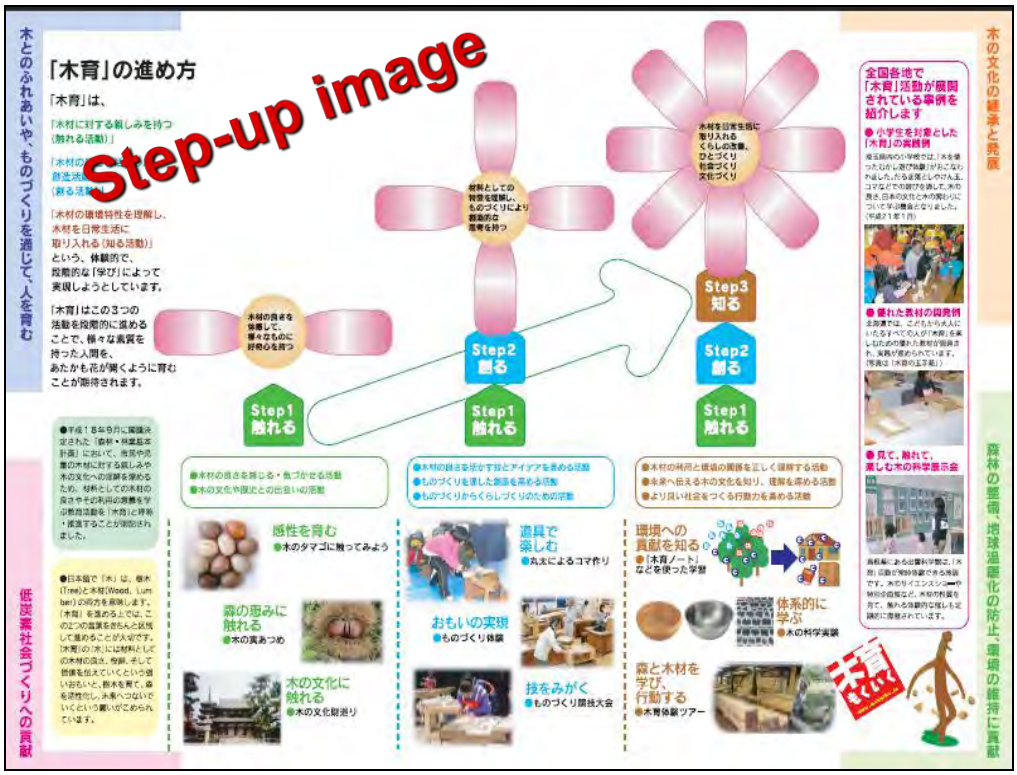
IWCS WOOD is GOOD

Features of wood education in Japan

- National strategy: **Basic Plan of Forest & Forestry** Japanese cabinet decision in 2006
- Leadership organization: Japan Wood-Products Information and Research Center
- **Diversified collaboration:** to call for a wide participation extending to communities
- Encourage all citizen and children to appreciate wood culture through **lifelong learning**
- Deepen understanding of wood culture and features, especially the **meaning** of wood utilization

Stepwise approaches

1. • Touching
   • Sensitivity
2. • Making
   • Understanding
3. • Learning
   • Application



Teaching materials

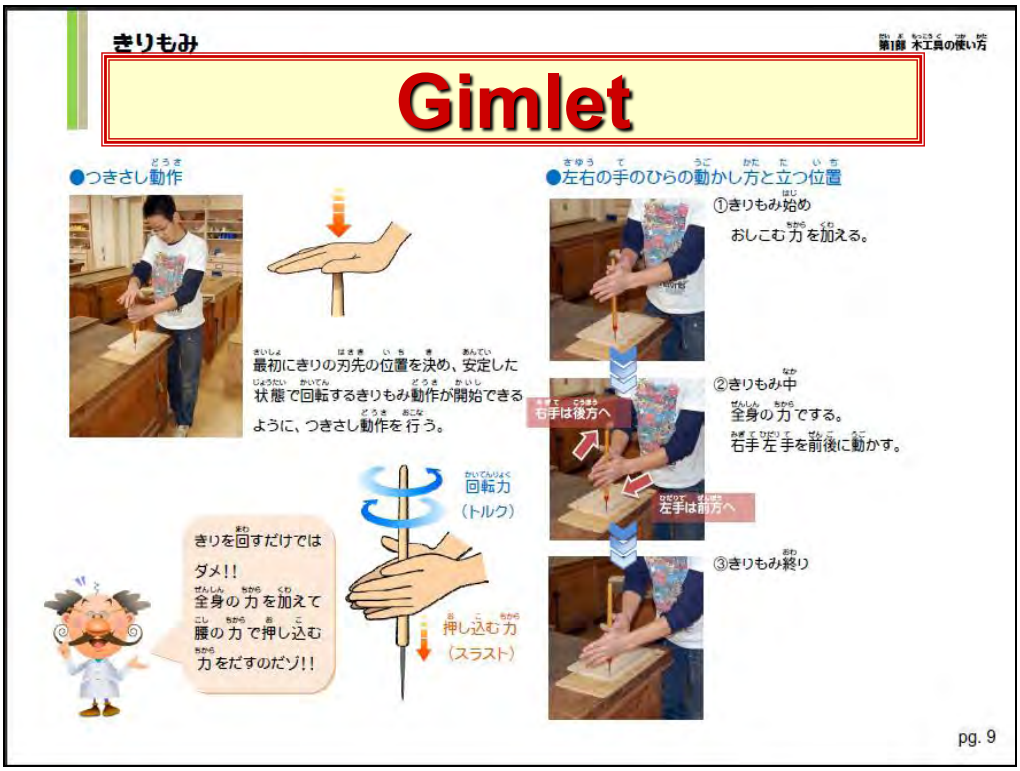
Tips of activities in wood education service package

- Time required
- Target learners
- Key words, summary and features
- Examples and goals
- Relationship with other steps
- Effective implementation cases
- Matters to be attended to
- Preparation of materials and tools required

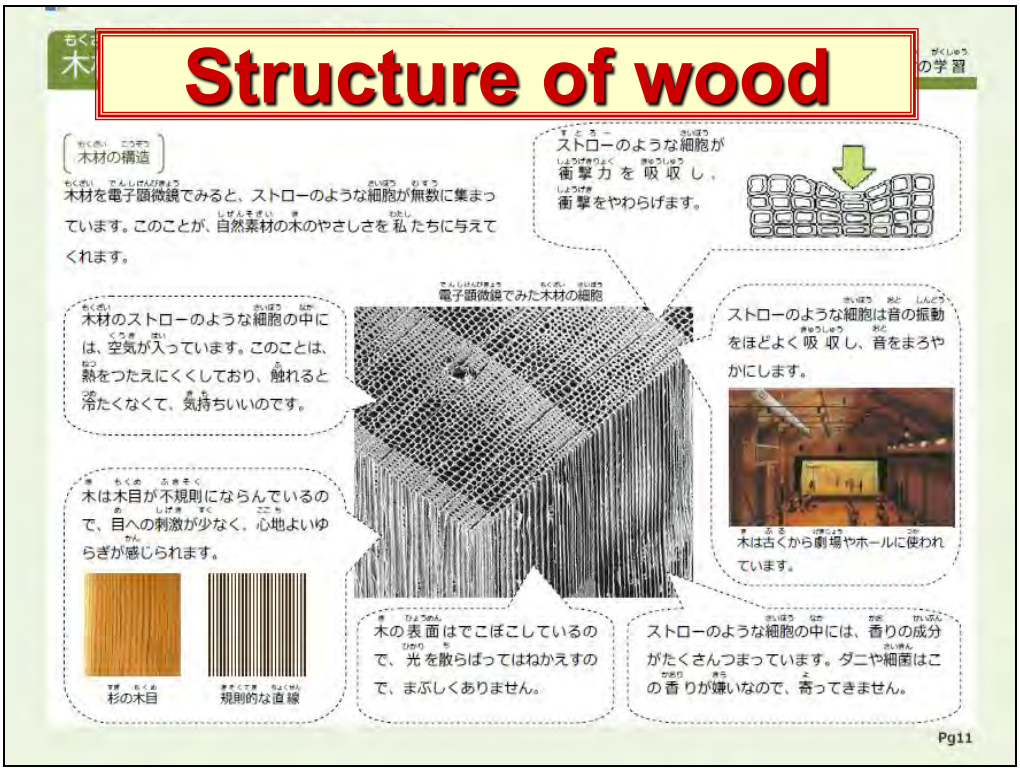

Manual of woodworking tools
木工具の使い方と木材の学習
財団法人 日本木材総合情報センター


のこぎりびき — ①
第1部 木工具の使い方
Hand saw
● 木材の固定（横びき用）
● 木材の固定（縦びき用）
万力で固定
クランプで固定
両手によるのこぎりびき (2)
万力で固定
pg. 1


次のページに移動
かんなけずり — ②
第1部 木工具の使い方
Hand plane
●こぐち
「こぐち」とは、ここの面のことですゾ!
●こぐちけずりの始めから終りまで
つよく押さえる
けずり始め
止まる位置
かんなの移動を示す図
●木材の固定
けずりやすい板の低い位置を万力で固定
けずり終り
止まる位置
かんなの移動を示す図
pg. 7


きりもみ
第1部 木工具の使い方
Gimlet
●つきさし動作
最初にきりの刃先の位置を決め、安定した状態で回転するきりもみ動作が開始できるように、つきさし動作を行う。
回転力
(トルク)
押し込む力
(スラスト)
きりを回すだけではダメ!!
全身の力を加えて
腰の力で押し込む
力をだすのだゾ!!
●左右の手のひらの動かし方と立つ位置
①きりもみ始め
おしこむ力を加える。
②きりもみ中
全身の力でする。
右手左手を前後に動かす。
右手は後方へ
左手は前方へ
③きりもみ終り
pg. 9


くぎうち
第1部 木工具の使い方
Hammer
●げんのうの柄の持ち方とくぎの打ち方
A:わしづかみ
（A、Bどちらでもよい）
B:人差し指をそえる
うまくなったら、柄のはじを持とう
しっかりくぎの頭を見て、ひじと手首の回転でうつ。
●くぎうちの始めから終りまで
①うち始め
平らな面
最初は平らな面でうつ
②うち中
③うち終り
丸い面
くぎの頭をげんのうの丸い面でしっかりうちこむ
最後の1ミリぐらいから丸い面でうつ。
pg. 10


Structure of wood
の学習
木材の構造
木材を電子顕微鏡でみると、ストローのような細胞が無数に集まっています。このことが、自然素材の木のやさしさを私たちに与えてくれます。
ストローのような細胞が衝撃力を吸収し、衝撃をやわらげます。
電子顕微鏡でみた木材の細胞
木材のストローのような細胞の中には、空気が入っています。このことは、熱をつたえにくくしており、触れると冷たくなくて、気持ちいいのです。
ストローのような細胞は音の振動をほどよく吸収し、音をまろやかにします。
木は古くから劇場やホールに使われています。
木は木目が不規則にならんでいるので、目への刺激が少なく、心地よいゆらぎが感じられます。
杉の木目
規則的な直線
木の表面はでこぼこしているので、光を散らばってはねかえすので、まぶしくありません。
ストローのような細胞の中には、香りの成分がたくさんつまっています。ダニや細菌はこの香りが嫌いなので、寄ってきません。
Pg11

Wooden temple

木材は、軽くて強く、加工しやすく身近にあったので、昔から住まいをはじめ、お寺や神社、暮らしの道具、工芸品など、さまざまなものに使われてきました。

日本には世界最古も世界最大もある

日本には世界最古の木造建造物である「法隆寺」、世界最大の木造建造物である「東大寺」があり、世界文化遺産にも登録されています。

木は重さのわりに、とても丈夫な材料なんだ。同じ重さの材料と比べてみると、スギを引っ張ったときの強さは鉄の4倍、押しつぶしたときの強さはコンクリートの6倍ですゾ。

世界最古 法隆寺

法隆寺は、ヒノキで建てられており、1300年経った今も維持されています。鉄やコンクリートにはこれほどの耐久性はなく、せいぜい100年程度と言われています。

世界最大 東大寺

東大寺の大仏殿は、世界最大の木造建築物です。直径約1m、長さ約30mの丸太を84本も使っています。現代の木造住宅の約860戸分に相当します。

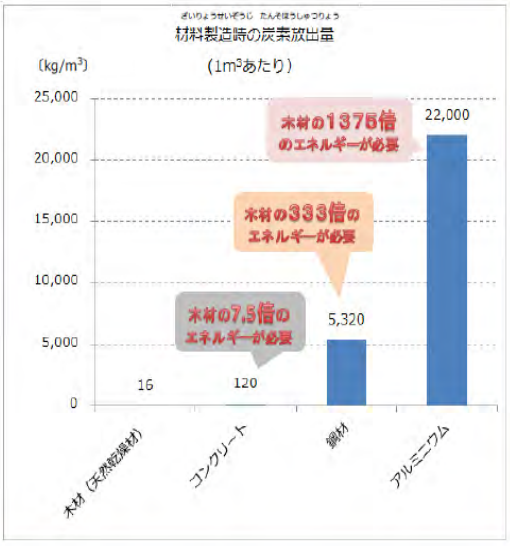
Energy comparison

木材の製造にはあまりエネルギーを使わない

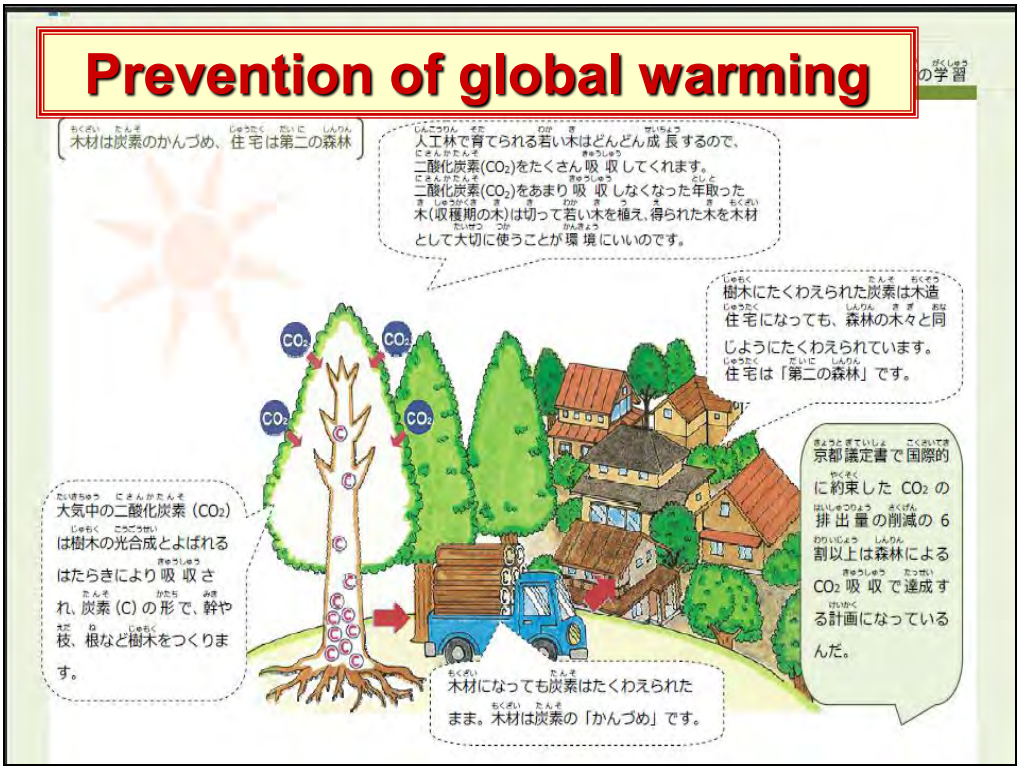
木を加工して、柱や板などの木材を製造するときには、他の材料とくらべて、エネルギーをあまり使いません。エネルギーが使われないということは、「地球にやさしい」ということです。

どれだけエネルギーを使ったかは、炭素の放出量で知ることができます。

地球の環境にとって、大気中に出る炭素の量が少ない方がいいので、木材は地球環境にやさしい建築材料といえるんだ。



Prevention of global warming



Renewable resource

木材は、一度使ったら捨てるだけではありません。
たとえば、家をこわしたときにできる解体材で、使える柱は別の家で使ったり、柱として使えない木材は細かくくだいて木質ボードなどにして家具をつくることができます。木材は形をかえながら長いあいだ使える材料なのです。
木質ボードも古くなって使えなくなったら、燃料として使えます。
また燃料として使っても、森林に木を植え、育てることで、再び木材として使える資源を生み出すことができます。
同時に燃やすことよって、貯えられていた炭素を二酸化炭素(CO_2)として大気中に出しても、再び木を植えることで吸収することができます。

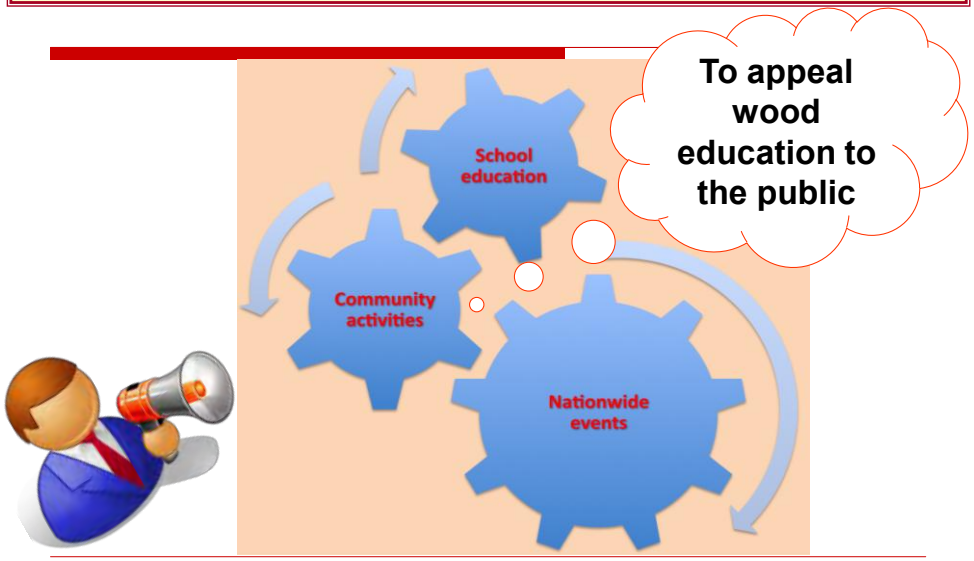
エネルギーになる石油や石炭は、使えば使うほど、減り続け、増えることはないんだ。でも、木は、伐ったら植えれば、くりかえし生まれて使える資源なんだ。

「地球にとってもやさしい木の家」 社団法人日本木造住宅産業協会より

Education resources

Website of Japan Wood-Products Information and Research Center
http://www.mokuiku.jp/

Diversified collaboration



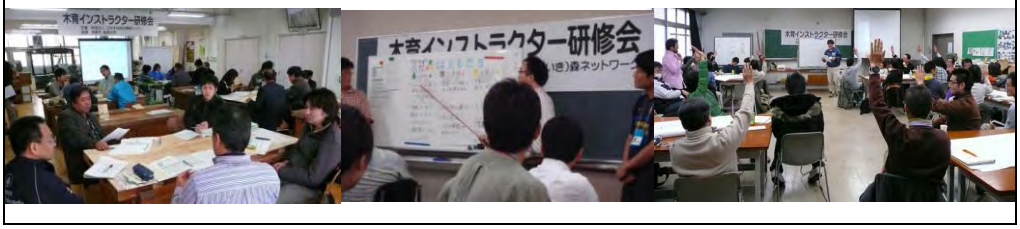
Mokuiku Forum in Shimane
木育フォーラム in 島根

Mokuiku Forum in Hokkaido
赤レンガ 木育フォーラム in 北海道

Course, What's Mokuiku
木育講習会 ～木育って何だろう～

Instructors training

- Two days program
- Lectures on wood education, practice of woodworking
- Final presentation of action plan individually
- Delivery ceremony of training certificate
- Trainees were from a wide range of university students, in-service teachers, employees in public and private sectors, and some housewives

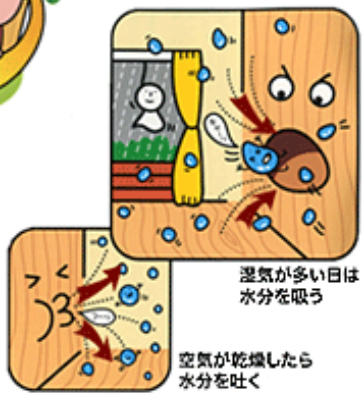


Off-school wood workshop

Wood advantages

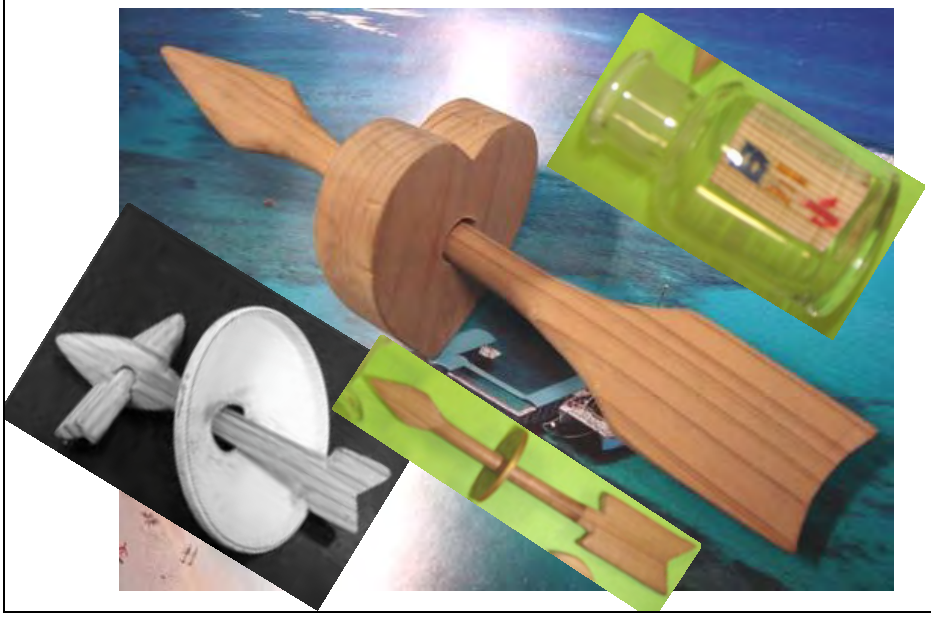
Human friendly

Ecology friendly

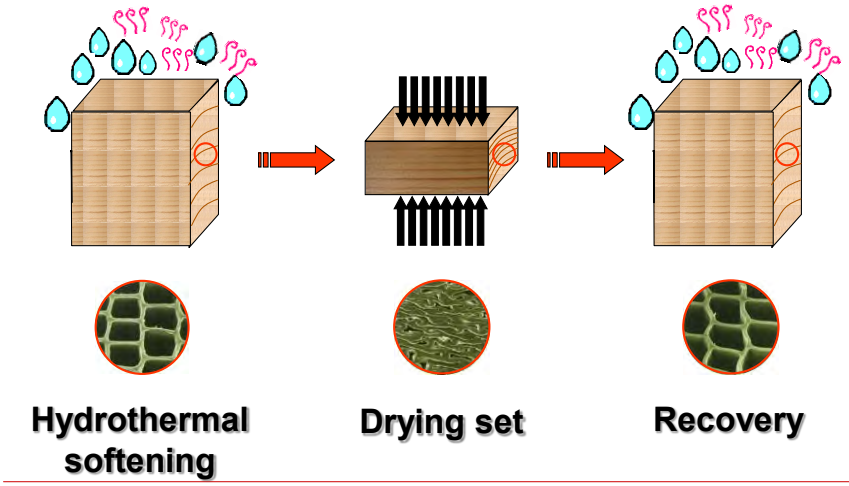


Good sensory characteristics in visual, auditory, aromatic, and tactile aspects, emotional stability, humidity conditioning, anti-bacteria

Fantastic wooden toys

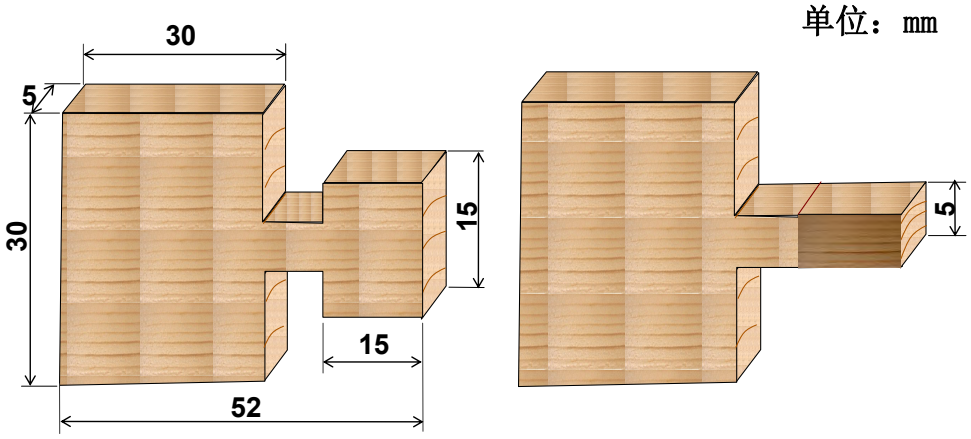


Shape memory characteristics of wood



Making strip activities

(For kindergarteners and lower graders of elementary school)



(a) Before compression (b) After compression

Sugi (*Cryptomeria japonica* D. Don) sapwood

What kind of strip do you want?

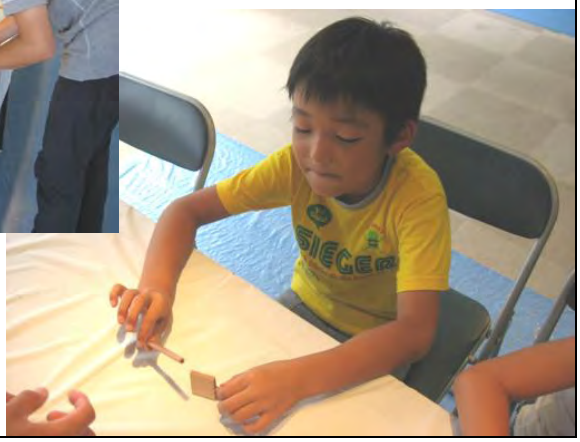
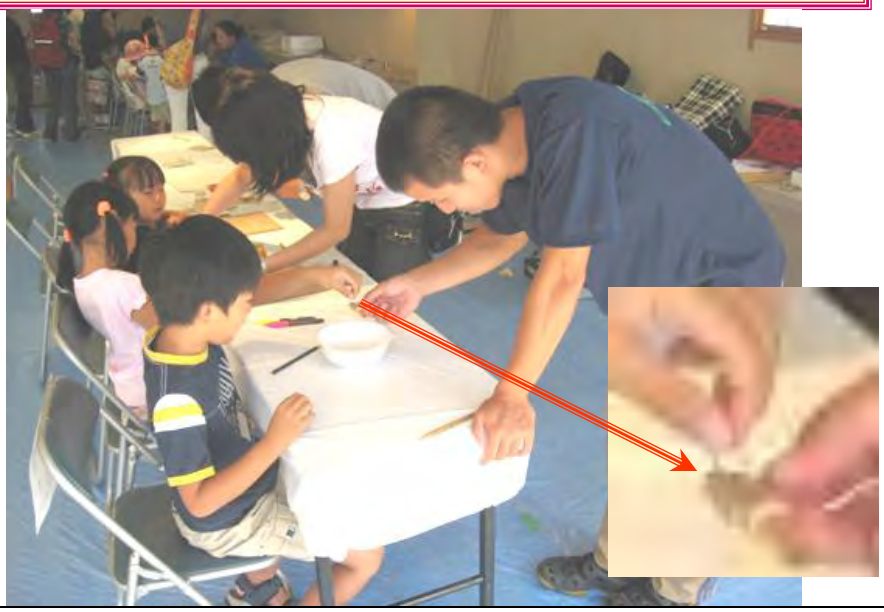


Figure drawing

Shaping with a jigsaw

Recovery of compressed deformation



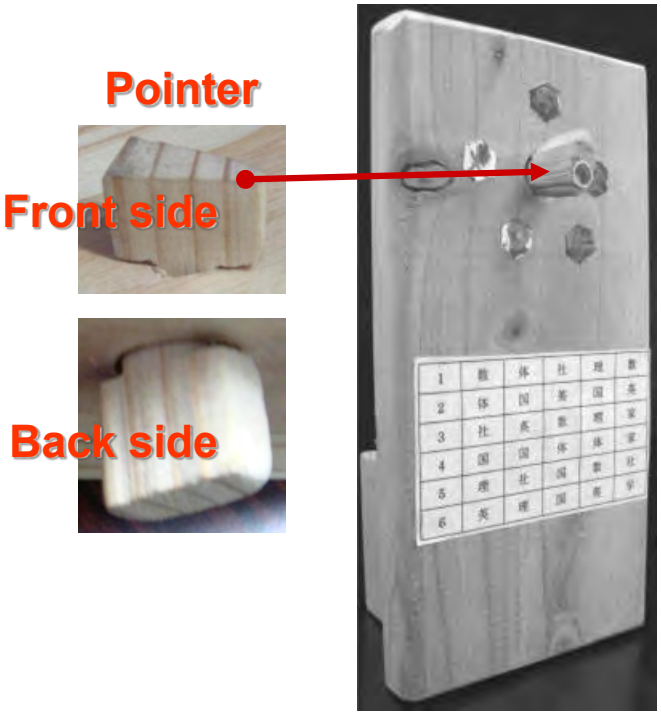
Boring holes with gimlets

Various strips

Favorite shapes

Waiting for making

Wood education instructors



Timetable board

(For upper graders in elementary school)

Samples and works

Fulfillment and enjoyment

Amazing experience at the early age is necessary to inspire children to become wood enthusiasts

All-Japan championship of woodworking skills
(For junior high school students)

About twenty players take part in the final competition each year who are winners from eight regional tournaments

Scene of Championship in 2011

Award ceremony

Judge's evaluation

Work's precision, attitude, skills, creativity, presentation impact

Awards

Top awards from Ministers of Education, Welfare, Forestry, etc.

Awarded works

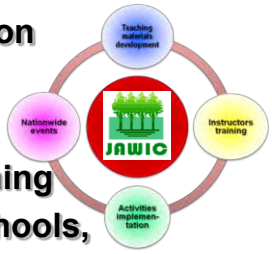


Reports from mass media
(Ripple effect of wood education on society)

This “idea-to-product” competition evolves students fully engaged in wood education

Conclusions

- Deliberate implementation of wood education
  - leadership & diversified collaboration
  - systematic stepwise approaches
  - development of teaching materials
  - forums, workshops, instructor training
  - lifelong learning environment in schools, communities, nationwide



- Praiseworthy impact on advertising wood benifits
- Cultivation of wood enthusiasts for a mass of green consumers is absolutely vital for the sustainable development globally

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The Need to Rethink the Forestry Sector Perspective in India

S.C.Joshi[2]

INTRODUCTION[3]

For the last few decades the forestry sector has been at cross roads in India. On the one hand, since almost all the natural forests and government plantations are under the control of state forest departments (SFDs), these SFDs face several criticisms *inter alia* that they are not able to protect natural forests properly and conserve their available biodiversity. SFDs are also usually blamed by other sector's official and many un-official bodies such as environmentalists, non-governmental organizations (NGOs), nature lovers etc., for not supporting the demand to provide forest lands for development purposes as well as for not fulfilling the demand of a large number of forest dependent communities, forest neighbours and rural poor.

At the same time, a large number of forest officials belonging to different SFDs, believe that they are committed and sincerely carrying out an onerous task of balancing two almost opposite responsibilities. This firstly concerns the protection and conservation of large and extensive extent of forest areas, which are almost like open treasuries, prone to misuse, if the small numbers of forest staff are evaded, particularly protecting valuable trees from illegal felling, diseases, fire etc., and preserving biodiversity and ecosystem services. The second concern is to ensure the availability of raw materials to priority sectors of the state (based on policy thrust). Foresters, therefore, believe that it is due to carrying out these commitments sincerely that their actions are interpreted in multiple ways, based on the interest of the concerned group or people and thus, usually they are blamed wrongfully. Whereas the environmentalists and NGOs are becoming ever bolder in strongly airing their views that it is the forest officials who have mismanaged the forests and are, therefore, not able to meet the aspirations of the society.

Thus it can be appreciated from the present scenario as described above that at the moment there exist two broad groups having markedly different views regarding the nature of forest management and it's implications for different sectors of the society, one whose proponents are largely the officials of SFDs and the other whose proponents are mainly environmentalists who in turn, wrongly or rightly, have the silent support from a large group of less educated and "impressionable" sections of society, particularly those who feel aggrieved that SFDs are not looking after their genuine needs. The former believes that since the beginning of first forest policy of 1894 till the latest policy of 1988, forest policies of India have been quite exhaustive in terms of both content and reach. In fact, according to this view (in a sense from the limited official perspective), due to the existence of comprehensive policies and their sincere implementation, foresters could bring almost all the existing natural forests under one or other type of control and management and were able to meet the priorities of the state over the years. The latter criticizes the SFDs for adopting wrong practices and therefore being unable to meet either stakeholder demands or provide environmental and ecological security to society.

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[3] The content of this paper is largely conceptual and qualitative in nature based on existing literature and studies related to forest management, forest laws and their impact on various stake holders as well as on author's personal experience of working in the state of Kerala and various other forestry organizations of Ministry of Environment and Forests, Govt. of India, as professional forester for the last 3 decades.

Role of forests

From the former point of view having exhaustive forest policies since 1890s have led to the emergence of many scientific forestry practices and valuable information concerning different types of trees from the point of view of their silviculture, mensuration, entomology, pathology, genetics, nursery and plantations raising techniques etc., and for the management of various types of forests in India. These in turn led to development of some of the earliest highly valuable scientific documents, procedures and records, such as the development of working plans, forest codes and forest laws. Consequently, almost all the valuable forests have been declared government property with differential accessibility with regard to obtaining tangible and intangible benefits from them by declaring them either reserve or protected forests.

However, from the latter's point of view the main purpose of various forestry practices based on different forest policies has always been to meet the revenue or wood demands needs of the state, initially of the colonial state and subsequently of the native government. According to this view, the forestry practices developed were on the lines of European practices made for largely single species European forests and thus not ideally suited to manage Indian forests having many species. Furthermore, due to an emphasis on meeting the demands of valuable timber yielding species of the state, forestry management practices were standardized only for ten selected species such as Teak, Sal, Deodar etc., at the cost of neglecting a large number of other species which were useful to forest dwellers, forest neighbours and a large number of assorted group of wood users. Moreover, for ensuring protection of forest for these valuable species, forest laws and acts have over the years mostly denied the access to various other goods and services earlier enjoyed by forest dwellers/ neighbours and communities. Additionally, a large number of multi species original forests were converted into mono species plantations of species valuable largely for the state such as Teak, Sal etc.,

The latter viewpoint, besides being the major plank of criticism often resorted to by the environmentalists, has of late started gaining greater currency among the large number of wood users as well as some of the environmentally conscious politicians in charge of Forest and Environment Ministry. This is largely due to two reasons, first, that forest officials, adhering to the former viewpoint, have been content with arguing their point of view through official documents or official channels, as they are not usually free to air their views either on their achievements or on the multiple constraints through any popular medium of publicity and awareness such as news papers and other electronics media. Also, due to the fact that the nature of their training and forestry practices, developed historically since the colonial period and continued until the present time, necessitated them to primarily concentrate upon the function related to forest protection and meeting the state priorities, at the cost of subjugating

the demands of other users and this often led to their failure to satisfy the critics holding latter view.

Secondly, the fact that the bearers of the latter view were, by training and profession, either highly educated and elite members of society or other professionals such as writers, academicians, or sundry group of educated people, who due to their education, social background and profession were free to write and propagate their ideas utilizing all possible mode of publicity such as popular articles, books, electronic media etc. Obviously, therefore, the view of the latter group have occupied much more public literary space and consequently achieved greater visibility and importance.

A deeper analysis and understanding of the existence of the two afore-mentioned type of views, would reveal that both the views are limited and narrow due to the great differences in professional background and world view and therefore in the nature of their learning/training, position, experiences and expected role in the society between the members of proponent groups of these two views. Notwithstanding the merits and demerits of the two views, it is however not difficult to appreciate that certain shortcomings do exist in the forestry practices used by SFDs in the management of society's natural resource like forests, as evidenced by the fact of inability of SFDs to meet the genuine demands of all the stake holders of forest resources. This is evident from the fact that despite more than hundred year old forest policies and practices and the existence of a very old and established forest administration throughout the country, which controls and manage almost all the forest areas of the country (all legal forests which include all natural forest areas and plantations in the forest area), foresters have not been able to meet the demands of all the traditional sector wood users and such other stake holders who depend directly or indirectly upon forests for their livelihood.

In fact, over the years, besides the above weaknesses, limited and inadequate focus of forestry practices have also resulted in many other lacunae in planning and functioning of SFDs. Some of the major lacunae in planning include non-availability of reliable data related to the extent of different type of forests including plantations and the condition of degradation in various layers of trees and other vegetation of natural forests, particularly in the predominant and co-dominant layers and in the overall biodiversity. Although data at national level is available through Forest Survey of India (FSI) reports, this data is too general and provides information on areas of forests under different levels of canopy closures, in other words it provides information on only the predominant tree layers of different forests, therefore it does not give any information on the condition of other tree and vegetation layers as well as on species composition and extent of biodiversity, moreover this data is often contended by various SFDs. Whereas, at state level, SFDs do collect and record data on the extent of various types of forests, different tree and plant species and the extent of biodiversity for preparing working plans, but of late even the working plan data is also contested by various independent academic and other organizations that have carried out studies to collect similar data.

So far as figures of demand and supply of timber as log or as industrial wood, pulp wood, fire wood etc., are concerned, the situation is much worse. Most of the SFDs do not have fool proof mechanisms of collecting such data and often independent studies undertaken by centres or the state under specific projects and schemes bring out the inaccuracy and inadequacy of the available data. Unfortunately even the various central government organizations of MOEF, such as FSI, ICFRE etc., do not have any fool proof method of collecting such data. Broadly, the problem with data collection is two fold, i) the data

collected by SFDs are not filtered through statistically acceptable methods using appropriate questionnaires and, ii) the complete exercise of collection and preparation of reports on these data is not considered an important function of the SFDs and is done in a casual and routine manner at lower levels by usually inadequately qualified staff from unimportant and relegated statistical branches of SFDs. Therefore, data collected is generally not supervised, monitored and verified. Resultantly, often different figures are noted for various components of wood and wood products belonging to the same year in the reports of above mentioned different sources.

Implications of the hitherto followed forest policies and practices,

Apparently, this situation whereby the forest administration has not been able to meet the wood and wood products requirements of various stakeholders is difficult to understand on a cursory examination, as after independence, presumably to meet the requirements of stakeholders, the first forest policy of 1894 made during the colonial period was changed twice, in 1952 and in 1988. However, on deeper examination, the reasons for such a situation could be found to lie in the historical dynamics of forest policies and forestry practices itself since their inception, more importantly in the policies and practices of Independent India. Due to the fact that during colonial times, priorities of colonial rulers were different, therefore neglect of the genuine demands of traditional wood users, especially of the unorganized workers such as handicrafts, and other artisans, is understandable. Since, during those days, demand from these communities were low and there existed community forests and desired specific trees in the natural forests which could be utilized, there was no apparent movement, or pressure to draw attention to the wood requirement of these communities.

However, over the years at the time of independence, the continued neglect of wood requirement of these communities along with continuous reduction in the availability of desired trees in the natural forest and therefore increased efforts to control their felling coupled with substantial reduction in community forests, has had multiple impact on these communities. Among many impacts, two important negative impacts were significant. First, due to non-availability of required trees and alternative resources needed by these craftsmen, artisans and other traditional wood users there has been a gradual decline in extent, diversification and standard of wood based traditional products, which were once a rich and prospering tradition. Secondly, due to almost negligible or no support and encouragement , over the years from the state, to meet the demands of these sectors, the communities involved in these activities has been greatly discouraged, their livelihood security increasingly came under threat resulting in forcing many members of these communities left their traditional profession. In other words, once an all pervasive and thriving culture of art and craft made out of woods and thereby the charm and joy inherent in the profession of wood use involving many such activities which were usually considered and described by wood workers and craftsmen emotionally satisfying and personally fulfilling got greatly suppressed and declined till the independence.

Fig.Vibrant wood Use culture and handicrafts

According to available information is mainly oral, provided by various craftsmen during various formal and informal discussions. This latter aspect is related to a certain type of special bond craftsmen feel while working with different types of wood. According to them, working with wood provides them with a unique experience owing to umpteen colours, patterns, texture of various woods, their distinctive smell, besides providing them a certain kind of joy while handling specific woods for carrying out plaining, carving, chiseling, modeling etc. to give them different shapes and forms to convert them into different wood products. After several decades of neglect of management of such woods and continuous loss of relevant trees from the natural and community forests, by the time of independence, the once vibrant culture of art, craft and joy of wood use had not only declined but was also discouraged due to post industrial opinions that wood as a material was inferior to many other industrially produced materials like steel, aluminum, glass etc., and thus using wood a material was considered as a sign of backwardness or under development, consequently the profession of all type of wood workers such as craftsmen became less preferred and unappealing to members, especially the young, of the communities traditionally related with such professions.

Under such a situation it was expected that after independence, modified policies and various practices develop to implement them ought to have been holistic, in order to set right the historical incongruities of forest policies and practices and should have rectified the lacunae and omissions of the past and provide equal opportunities of access to forests and it's produce to all stake holders, particularly to those hitherto neglected communities such as traditional wood workers. However, in hind sight, it is evident that though theoretically forest policies after independence did mention meeting the needs of traditional users of wood, rural poor and tribals, the expected efforts to make available wood required by these communities remain neglected. This was largely because forestry practices, since independence, have not been holistic and integrated and have taken place in intermittent waves of limited focused thrust areas.

Further, these waves of thrust areas were neither organically linked nor comprehensive, particularly from the point of view of meeting the needs of large sections of wood using traditional sectors and populace, as they were either oriented towards meeting the demands of organized wood based industry or are focused upon meeting some specific consumption needs of the rural poor and forest dependent communities at the cost of neglecting demands of traditional wood using craftsmen and artisans.

Initially i.e. soon after independence, the forest practices were intended to increase the productivity from the forest and therefore, multispecies forests were replaced with plantations of economically important species. Subsequently, the thrust of forest practices shifted to meet the demands of wood based industries and a large extent of natural forests were converted into plantations of industrially important species. Thereafter, a wave of conserving the natural forests and raising fast growing species outside the forest areas, under the social forestry schemes emerged. This thrust which emerged during early 1970s, along with emphasis on augmenting the degraded natural forests through schemes like joint and participatory forest management (JFM\PFM) assisted natural regeneration (ANR) has been the main focus of forestry practices since then. In between, some limited specific

purpose schemes based on interest of the then existing governments, particularly ministers of forests and environment keep on emerging and implemented by SFDs such as raising and supplying medicinal plants to the communities etc.

Development of environmentalists limited point of view

After independence, parallel to the above developments, awareness of conservation of nature and environment started emerging among the NGOs\ environmentalists. The process started during the 1960s, with the awareness, influence and adoption by the Indian NGOs\environmentalists and of a particular type of ideology of conservation propagated by many international organizations' programmes and movements, such as, Man and Biosphere programme (MAB), World Conservation Strategy, United Nations Conference on Human Environment (UNCHE), 1972 etc. Since the referred philosophy of conservation originated in the rich and developed countries it largely concentrated upon preserving the quantity and quality of existing natural wild life and natural forest areas for conservation of specific wild life species or for the sake of eco-tourism or ecological values of such conserved natural areas. In other words, since in these developed countries there was hardly any human population which was dependant on the produce of these natural forests and wild life areas, not only for day to day survival needs but even for any type of tangible forest produce, it was understandable that these conservation strategies initially evolved in developed countries but were subsequently adopted and strengthened on similar lines by Indian environmentalists in essence recommending a complete ban on any type of management strategies related with providing wood products to any sections of the society.

Fig. Thrust in forest practices

Such a conservation strategy actually strongly discourages any felling of trees for wood from forests to meet even genuine demands of people as is actually met from the various forest resources available in India, legally or illegally and insist on leaving forests as such for bio diversity conservation and for providing environmental and ecological services to the society and the nation. However, it can be appreciated that such a strategy is not suitable for India where historically there exists genuine unfulfilled demands of wood and NWFPs both for day to day survival and professional needs of various wood workers. But unfortunately in general most of the environmentalists in India without holistically considering the reasons or constraints under which various type of forestry practices were historically developed and followed by SFDs, which have been the cause for historically existing unfulfilled demands of certain sections of the society, and therefore instead of suggesting appropriate strategies, have been recommending leaving the forest areas as such mainly for biodiversity conservation and for ecological values.

In fact, often some of the NGOs and environmental groups, which are under stronger influence of western conservation discourse, do not recommend use of such fast growing exotic trees which are almost naturalized and have comparatively greater potential to meet the genuine needs of hitherto neglected stake holders, as compared to several native species, by espousing an extreme and narrow

ideological view that is evidenced from among other of their oft propagated ideas. Firstly, that for providing raw materials to traditional wood workers and meeting the needs of rural poor only native trees should be propagated and harvested. Secondly, that as such wood use should be minimized and in its place other materials should be used, in order to avoid tree felling and loss and degradation of forests. Such has been the impact of repeated propagation of this type of arguments coupled with their influence on large number of forest dependant communities and some of the environmentally conscious politicians, that in recent decades an overarching general idea has been in vogue that since wood use, necessitates tree fellings, it would ultimately lead to environmental and ecological ill consequences.

This view had such a tremendously powerful psychological influence on officials of SFDs, that nowadays they not only maintain an indifferent or unconcerned response even to the genuine needs of stakeholders including wood workers and wood based industries but often put forth untenable and at times illogical arguments to defend their behavior or actions. However, this much propagated idea that wood use is bad for ecology and health of forests is the consequence of insufficient knowledge and inadequate appreciation of various types of forests as well as on all possible combinations of their management options, which may allow achievement of goals of conservation along with meeting tangible needs of stake holders. For example, the above view lacks appreciation of the fact that given availability of both biodiversity rich natural forests and mono species or few species based plantation forests, through holistic planning a sustainable management model could allow conservation of ecologically sensitive and environmentally important natural forests without felling any trees, and at the same time meet the wood requirements of the society sustainably without causing any carbon footprint from existing and new appropriate plantations managed on sustained yield principle.

The situation has come to such an impasse that at present a situation exists wherein due to less public acceptability of the views of foresters along with over arching influence and acceptance of the limited and non-holistic much propagated view of the environmentalists to reduce wood use, the foresters who should actually advocate greater production and use of wood prefer to remain silent on this issue during various official meetings and other programmes. At the same time the influence on the policy makers of limited and narrow conservation discourse propagated by the environmentalists are getting evident in the latest policies and programmes proposed by Ministry of Environment and Forests (MOEF) of Government of India (GOI). A glaring example of this influence is discernible in a highly ambitious latest programme of MOEF called “Greening India” in which several thousand crores of rupees are earmarked for raising plantations for rural poor and tribals but hardly any allocation is considered for meeting the genuine needs of wood using organized and unorganized sectors.

Therefore, the situation at present is paradoxical, wherein in order to address present day environmental challenges along with meeting genuine demands of various stakeholders including wood using organized and unorganized sectors there is a need to sustainably produce more of the relevant trees and harvest them from government plantations and other private areas, besides conserving the natural forest areas. But the environmentalists and therefore the general public, due to ignorance and influence of the dominant view created by these environmentalists, believe wood use is harmful for environment. In fact, at present, the foresters are considered anti-development by the other sectors of economy, mainly industrial and infrastructure, and against the poorer sections of the society by the environmentalists, as referred earlier. The foresters themselves due to historical weaknesses in the forestry practices have become mute spectators and feel constrained to come out with appropriate

solutions and strategies to answer either the arguments of environmentalists or to fulfill the demands of stakeholders, particularly traditional wood users and craftsmen.

Opportunity provided by the climate change

However, it appears that the whole awareness and acceptance of the truth that over the years due to unsustainable production and use of various resources, the climate has definitely been effected and global warming needs serious consideration in future development discourse and strategies. This has created a very potent opportunity to propagate the use of wood as well as to refute scientifically the argument made by environmentalists that in general wood use is harmful to the environment. As, during the last few decades the debate on global warming has clearly demonstrated that the main reason for global warming was the development path taken in the past, of ever increasing consumption of mass produced goods, mainly after industrial revolution, especially using non-renewable resources. And that such a path is not only unsustainable but needs to be changed, if climate change is to be managed. It is now increasingly accepted that such technologies and products which increase emission of Green House Gases (GHGs) and have high carbon foot prints both in production and use, cause climate change along with irreversible depletion of raw materials and ultimately may lead to natural and man made disasters of such proportions that the survival of human race itself would be in danger.

It is in this scenario that wood use as a raw material and product is the most relevant strategy, not only from a scientific point of view but also from the socio-economic, cultural and aesthetic point of view. Scientifically speaking wood is a renewable and natural product and therefore not only does not need any energy or lead to any carbon foot print in its production, as it is produce through photosynthetic activities of trees, using sun's energy but at the same time can be produced and used sustainably if appropriate policies and management practices and adopted. This can be achieved by adopting the strategy of removing from the total available wood stock only that much quantity of wood each year, which is equivalent to the quantity of wood added during that year, if the material is removed from the natural forests through selective felling or by planting new areas equivalent to the extent of area felled in the case of plantations. Besides, once a wood product is made it locks carbon for several years. And finally due to availability of modern technology and machines, even the waste wood can be converted into different lignocellulosic products and thereby minimize carbon emission to almost negligible levels, compared with other raw materials, like iron, steel, concrete, glass ,aluminum etc..

Compared to wood these latter much heralded and greatly used modern raw materials in both developed and developing economies not only require a lot of energy for production inside the factories and cause emissions of GHGs but often requires cutting of forests to create the necessary production units (Factories/plants) and thereby cause long term harm to the eco system by removing valuable carbon sinks (i.e. forests).

Thus, in these times of climate change encouraging and actually using and sustainably producing the wood is the most appropriate development strategy. Once this fact is appreciated and internalized, the next important issue and perhaps more challenging one would be to actually achieve this objective. Because to achieve such a goal not only hitherto adopted forest management policy and practices need to be changed but also a great deal of appropriate research, technology development and extension activities need to be done by the

SFDs to make all the stake holders agree to this strategy and willingly cooperate in this endeavour.

Such being the need of the present times so far as strategic perspective on forestry sector is concerned, the situation demands firstly a clear appreciation of the fact that simply having well intended and written forest policies is not sufficient to meet the genuine demands of all the stake holders. To achieve this objective sustainably, the forestry sector plans both at the GOI (MOEF) level and subsequently at SFDs level must be based on correct data on type of demands of all stake holders' vis-*à-vis* all available forest and wood resources to meet them. These facts should then be used to set long and short term priorities with regard to type of schemes and programmes GOI and SFDs must prepare. These priorities should in turn be based on certain preferential weightage given to the demands of weaker and hitherto unrepresented sections of the society. Additionally any particular scheme or programme's project must clearly indicate the methods of regular monitoring and evaluation as well as mechanism for course correction. Finally inter alia, these projects must include clearly specified unambiguous and easily monitorable physical indicators for each and every objective of the project.

Secondly, and most importantly, to achieve the above goal there is a need to reverse the existing paradigm with regard to wood use, instead of hitherto widely propagated thinking that wood use must be reduced and substituted with other materials, the present thinking should be that wood as a material is good and must be encouraged. The motto "Wood is Good" must be firmly accepted and adopted by not only all the stake holders of forest and forest products but all the sectors of the economy. Once the importance and necessity of such a paradigm is truly appreciated and therefore imbibed by relevant players- such as MOEF, SFDs, environmentalists, sectors related with infrastructure industry, planners, economists etc. - then the synergy needed to sustainably produce and supply the genuine demands of wood of the growing economy can be met from within the Country, after regulating import at appropriate levels, by fixing realistic appropriate priorities and targets, as referred above.

Since one of the most important aspect for succeeding in the latter endeavour would be the change of existing mind set about wood use among environmentalists, and the acceptance of this changed paradigm by society, the role of environmentalists – NGOs, voluntary organizations, nature lovers, academicians etc. - along with efforts to revive and invigorate the lost culture of "art and joy" of wood use, is very crucial. Broadly stating this may require, first, concerted efforts to propagate awareness and knowledge with the help of environmentalists, who are more articulate and whose views are more accepted in the society, on advantages of wood as a raw material, particularly in these times of climate change, compared to other hitherto much used materials like iron, steel etc. Secondly, all out efforts must be made to showcase successful examples of old and existing traditions of solid wood use, which is aesthetically and culturally rich and lock carbon for many decades along with encouraging causing use of several modern wood products made of fast growing small girth timber largely produced outside forests such as plywood, and several other panel and engineered wood products, through continuous and repeated publicity and extension methods, with the help of expert extensionists and environmentalists.

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THE NEED TO RETHINK THE FORESTRY SECTOR PERSPECTIVE IN INDIA

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How do we dovetail (reconcile) the idea of ART and JOY of wood in the serious business of forest management and wood use in a particular economy or region?

Because, on the face of it, one refers to a higher level of thinking and creative urges usually without any need to consider political economy of resource. Whereas, the other refers to the whole gamut of politico-economics and administrative issues related with resource management.

Rediscovering Wood: The Key to a Sustainable Future
An International Conference and Exhibition on the Art and Joy of Wood
19-22 October 2011, Bangalore, India

However on a deeper examination it appears that perhaps this apparently unrelated idea of ART and JOY of wood could become the foundation of finding solution to several weaknesses of present day forest policies and management issues, particularly in the scenario of climate change and ever increasing need to look for sustainable development.

To appreciate how this is possible, there is a need to view the two concepts holistically from the historical perspective

Therefore, an attempt is made here to conceptualize this seemingly difficult proposition by historically analyzing the present day situation of ART and JOY of wood use and issues related to forest management

Material and Culture

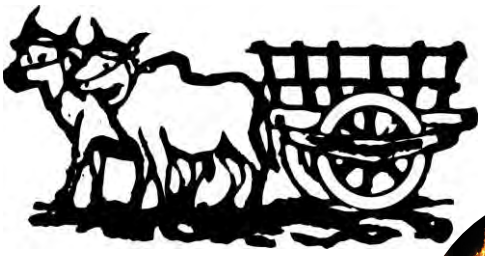
Art and Joy of use of any material largely relates to the culture of the society.

The philosophy of life, religious and spiritual beliefs, developed historically over the years, reflected in the meta-physical thinking, creative ideas and values of the society, which gets echoed in the art, craft and other joys associated with use of the material

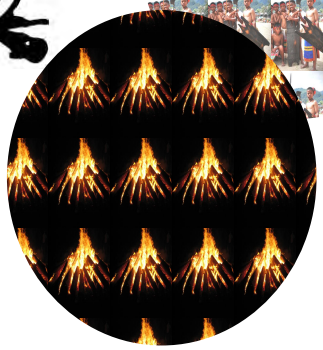
Availability and affordability of sufficient quantities of desired qualities of material resources is one of the conditions for the art and joy of use of any material besides existence of factors conducive to development of creative ideas and long periods of creative activities.

THE STORY IS SIMILAR FOR WOOD

Before Industrial Revolution, wood use was not very different across different societies



Resource was in plenty and requirements were limited in most parts of the world; technology was simple



Rediscovering Wood: The Key to a Sustainable Future
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Wood use covered all aspects of human needs. Even magnificent wooden structures came up during the period

An old wooden monastery in Europe

Rediscovering Wood: The Key to a Sustainable Future
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Wood use in Asia was not far behind Europe…

The oldest fully wooden pagoda in China - The Fugong Temple of Liao dynasty (1056AD). It reaches a total height of 67.31 m (220.83 ft).

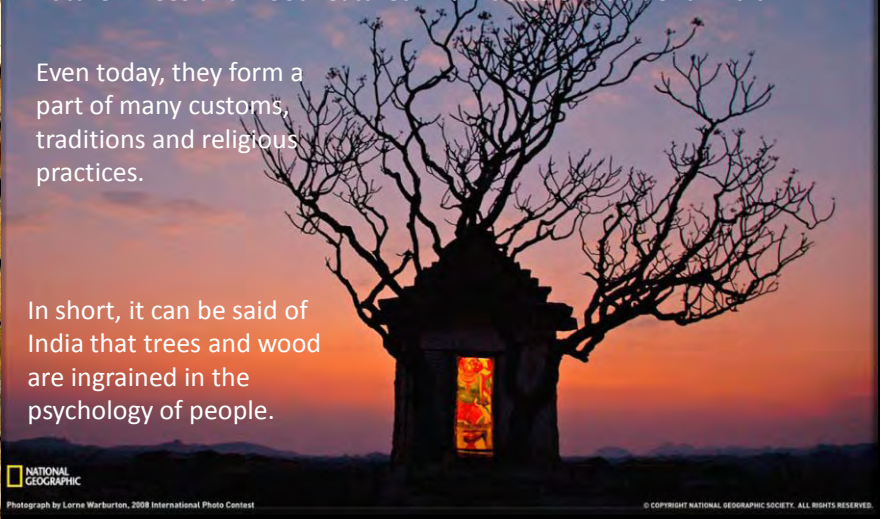
The Sanctuary of Truth in Thailand is a gigantic wooden construction. The top point of the building is about 105 meters high

India…

Historically, India is a nation that has walked hand-in-hand with nature. Trees and wood featured in all facets of traditional India.

Even today, they form a part of many customs, traditions and religious practices.

In short, it can be said of India that trees and wood are ingrained in the psychology of people.



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India is a Nation that worships Nature. Many trees, like *palash*, *peepal*, *neem* and *rudraksh*, are deities to them. Nakshatravanams (forests associated with astrology) have been created at many places
Peepal
Rudraksh
Rediscovering Wood: The Key to a Sustainable Future
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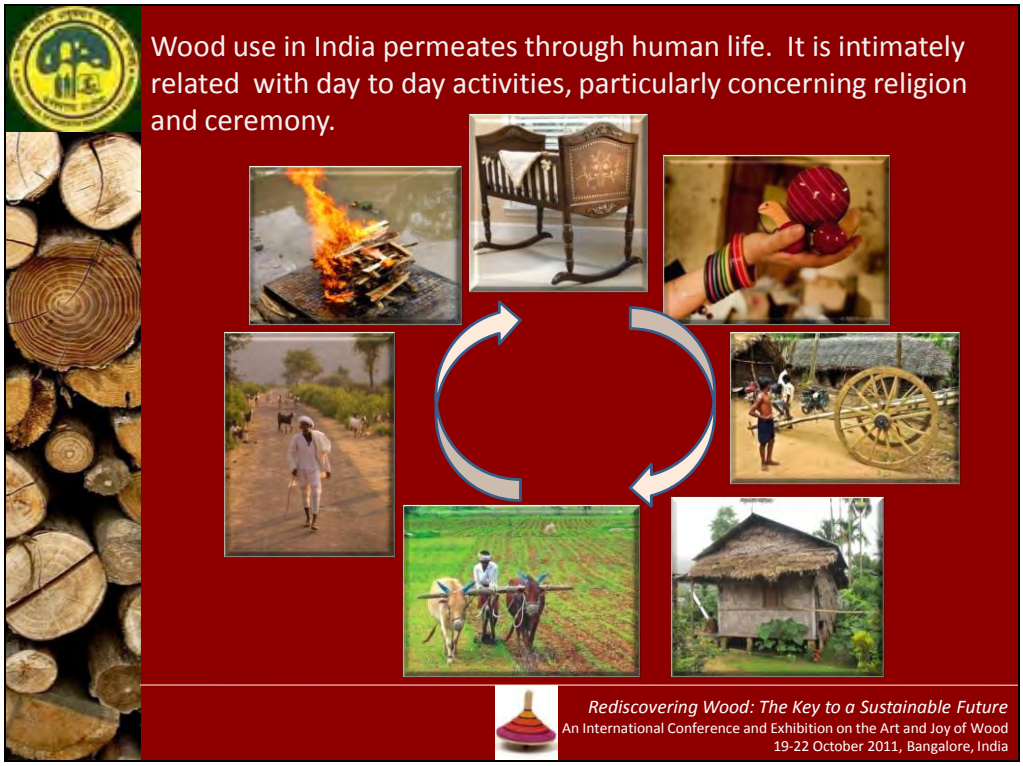
Wood use in India permeates through human life. It is intimately related with day to day activities, particularly concerning religion and ceremony.
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Ayurveda (Indian form of medicine), in particular *Vrikshayurveda,* uses many parts of trees including wood

Sandalwood helps in vitiating burning sensation, headache, hyper perspiration, skin disease, psychotic ailments, memory loss, cardiomyopathy, ulcer, jaundice, cough and inflammations

As is everywhere else in the world, India has its own share of indigenous musical instruments made of wood

Veena

Mridanga

Ektara

Santoor


India has a rich culture of wooden toys and handicrafts. The country is famous for intricate wooden carvings
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Wood is also extensively used in leisure and play
JANDIAL
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A HISTORICAL PERSPECTIVE FOR DECLINE IN THE ART AND JOY OF WOOD-USE IN INDIA

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After the Industrial Revolution there has been a perceptible change in wood use across different societies of the world

In fact, wood was, in one way, instrumental for the Industrial Revolution. Energy was primarily obtained from burning wood. It was the principle material for railways, ships, bridges and other constructions.

Changes in wood-use after the industrial revolution

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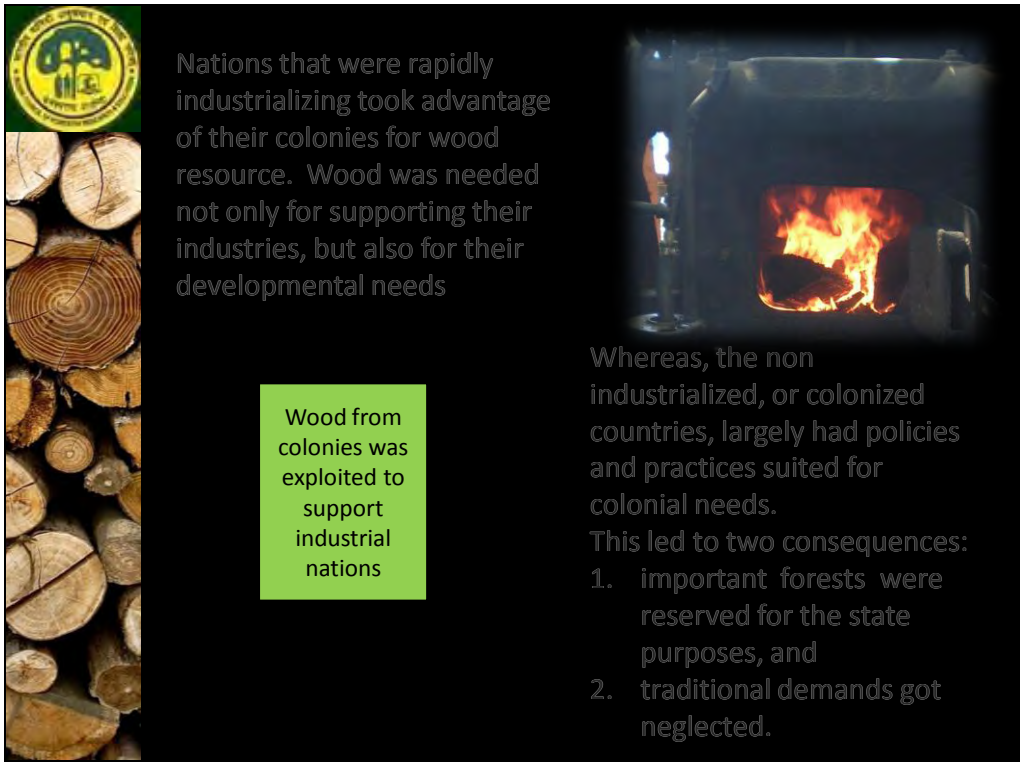
Nations that were rapidly industrializing took advantage of their colonies for wood resource. Wood was needed not only for supporting their industries, but also for their developmental needs
Wood from colonies was exploited to support industrial nations
Whereas, the non industrialized, or colonized countries, largely had policies and practices suited for colonial needs.
This led to two consequences:
1. important forests were reserved for the state purposes, and
2. traditional demands got neglected.


This has, perhaps, led to a great difference in viewing ART and JOY of using wood in different societies – industrialized and emerging economies
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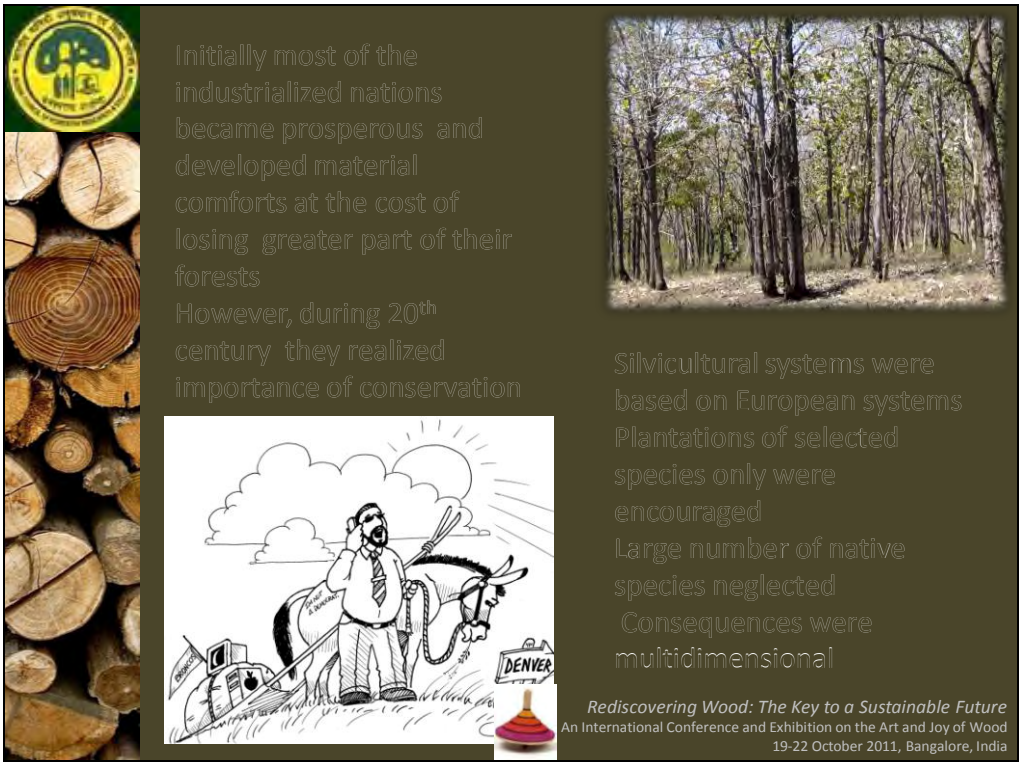
Initially most of the industrialized nations became prosperous and developed material comforts at the cost of losing greater part of their forests
However, during 20th century they realized importance of conservation
Silvicultural systems were based on European systems
Plantations of selected species only were encouraged
Large number of native species neglected
Consequences were multidimensional
DENVER
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A strong technological base was developed in industrialized countries .
Conservation consciousness gained momentum particularly after 1960s.
Art and joy of wood of niche kind was developed.
PLANT TREES,
SAVE OUR PLANET
Policies and practices in India did not change even after independence.
However, two different independent forces further aggravated the existing ills.
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In advanced countries technology for large scale exploitation got developed. Rebuilding forests was taken up seriously, and sufficient wealth and time allowed following conservation and environmental movements.
Environmental awareness leading to critical view of forest management started emerging. Practices became large scale and followed waves.
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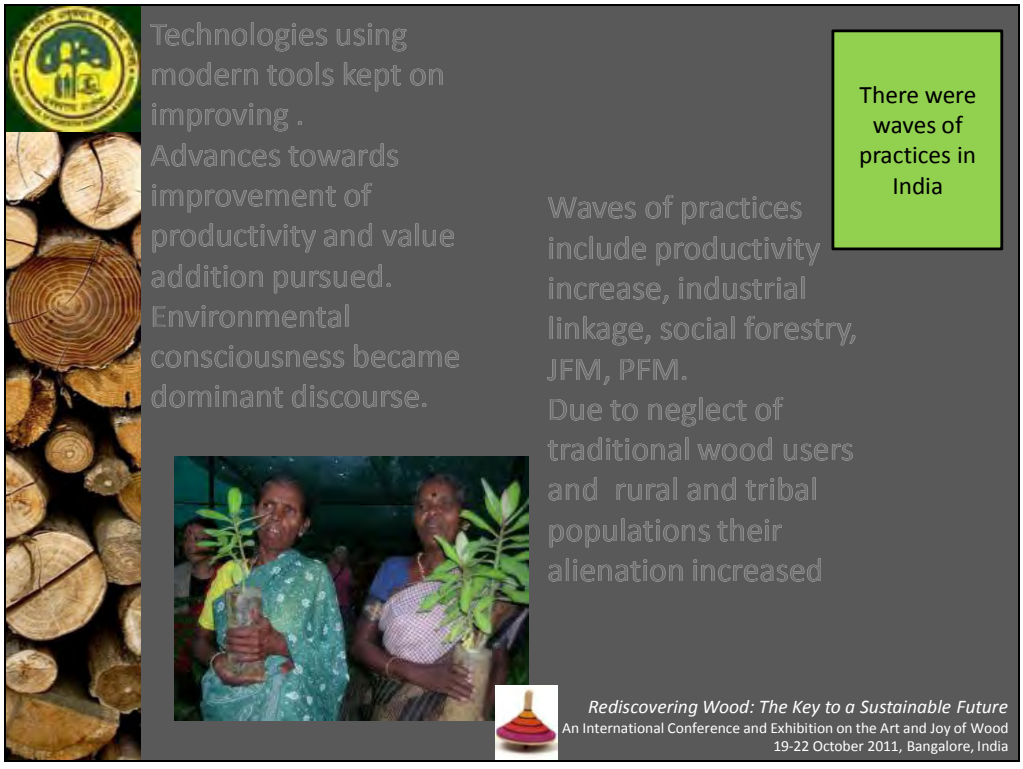
Technologies using modern tools kept on improving .
Advances towards improvement of productivity and value addition pursued.
Environmental consciousness became dominant discourse.
There were waves of practices in India
Waves of practices include productivity increase, industrial linkage, social forestry, JFM, PFM.
Due to neglect of traditional wood users and rural and tribal populations their alienation increased
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Today, the more developed industrialized nations can afford conservation and keep their traditions alive. They have a culture of both conservation and commercial exploitation. They also have the scope for developing niche areas of wood use – for ART and for JOY

Scope for Commercial exploitation, Conservation and Art & Joy was possible in advanced countries

In many emerging nations like India, the gamut of activities concerning ART and JOY of using wood appears to be on a decline. In fact, there is a downbeat with ART and JOY of using wood

There is a peculiar situation in India, where resource use is very skewed and with the liberalization of import and economic growth, newer demands from the neo-rich has been met by imports and a vast section remains out of the focus of forest managers, particularly traditional users and traditional industries.

Demands of the neo-rich are met by exports and traditional users are not in the main focus

Without proper policies and practices in the department, rural poor, wood users are increasingly getting alienated.
Changing policies have not helped the cause.


Current large-scale import of timber also does not help
Thus, on the one hand, forest dwellers and traditional wood workers feel deprived. While on the other even the organized industry is suffering.
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Knowledge about availability and demand of wood is not accurate. Research and technology development is very poor. Policy appears to lack holistic and integrated approach.
A very dominant and strong force of a wide array of assorted groups and individuals critical of forest management make the matter worse.
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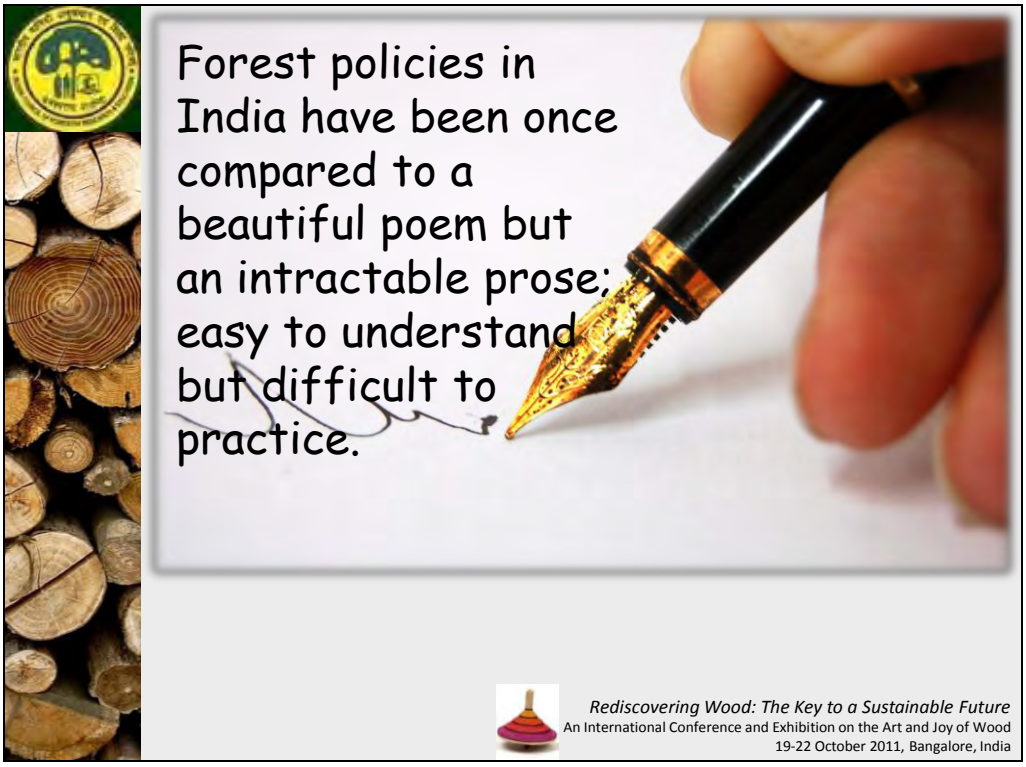
Forest policies in India have been once compared to a beautiful poem but an intractable prose; easy to understand but difficult to practice.
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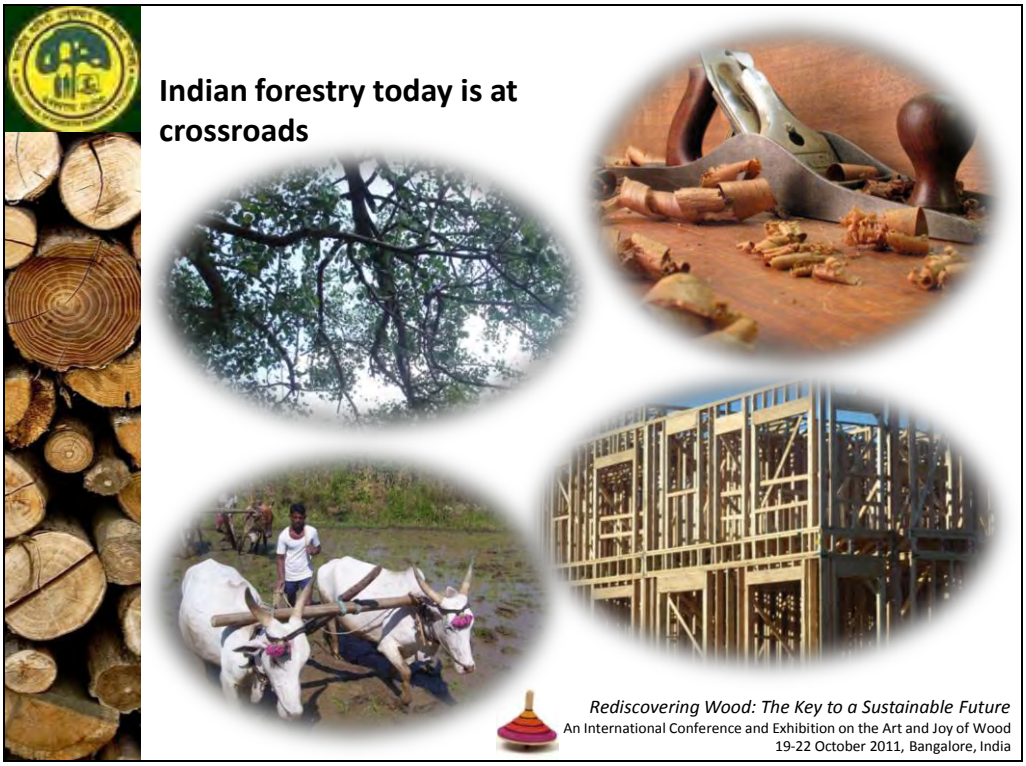
Indian forestry today is at crossroads
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CONSERVATION WAVE IN THE BACKGROUND OF LACK OF HOLISTIC APPROACH

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Conservation and environmental concepts without considering ground realities taken up by many assorted groups in India, have in a way, propagated the idea of wood use as anti-ecological which is largely acceptable to politicians

Forest managers have become mute spectators in the light of their inherent weakness to meet the challenges both from environmentalists and genuine wood users.

Forest managers therefore do not dare to take a stand for advocating meeting the genuine demands of not only industry but also the traditional users.

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The growth in economy is causing ever more demand of wood materials, which is met largely from import, forest department playing hardly any role.

The departments are still continuing their old practices of planting few selected species therefore unable to meet the demand of traditional uses, industry as well as from neo rich.

All the above factors led to ongoing debate in the country on "Conservation versus Development", in which foresters have become silent and ineffective players and are often labeled as villains

Coupled with all these, the forest department does not have a holistic policy, practices, skill and technology to deal with the present crisis.

This is the paradox faced by the country

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In fact the overarching social thinking of reducing wood consumption may actually be a bane to the society and environment

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WHAT ARE THE SOLUTIONS… ?

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One of the key areas for improvement is in sound policy, planning, implementation and monitoring. Conservation needs to be kept in focus and impetus should be laid on developing technologies based on actual requirement.

Changes are needed in policies

Synergy in various sciences in the need of the hour

This can be achieved by synergy in various sciences like physical, chemical and biological to meet the demands of industrial and other wood users. It requires actual knowledge of the true requirement and balancing the ecological and developmental consideration using appropriate technologies

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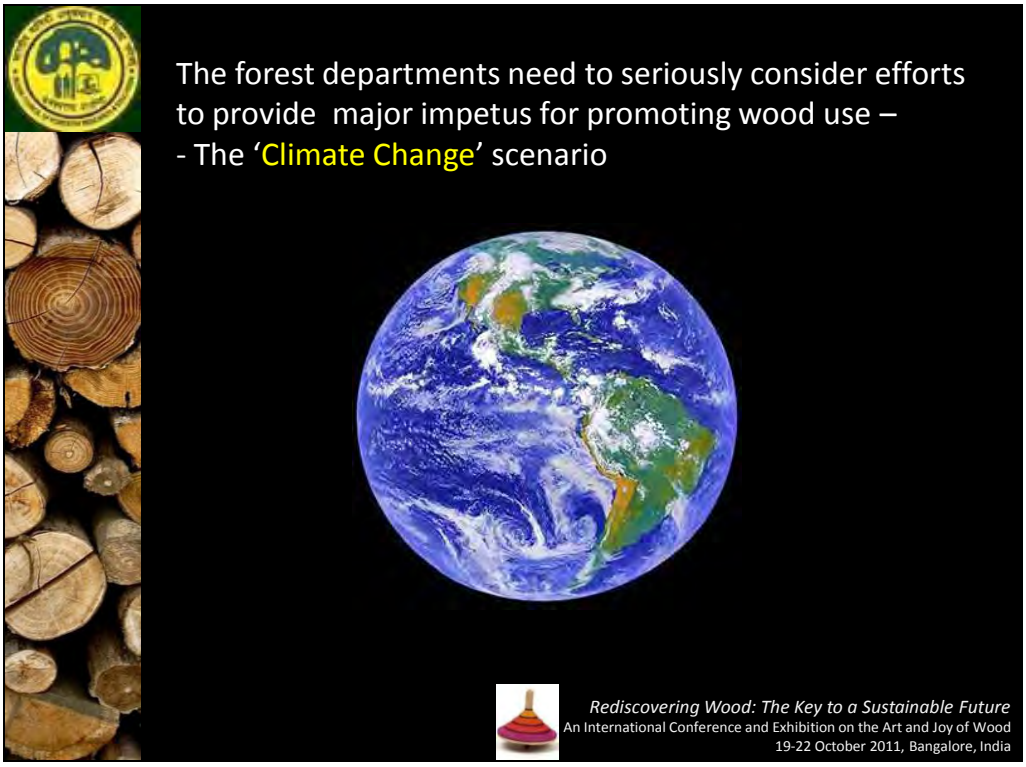

- Efforts are needed:
  - Holistic policies and practices
    - Policies which ensures proper implementation
    - Practices based on ground realities and therefore
    - Must include genuine requirements of all sectors keeping in view the development requirements, state of existing natural forests and biodiversity as well as plantations, therefore need
    - Correct data, appropriate technology and a concerted effort to change the mindset of all concerned.

- In terms of policy and planning :
  - Conservation strategies –natural forest
  - Production strategies – plantation, private and public
  - Substitution of carbon intensive materials
  - Appropriate research
  - Appropriate extension

Widespread 'substitution' of wood by energy-intensive material like steel, aluminum, plastic, etc., and extensive use of wood in 'quickly perishable' products like paper, newsprint and packaging has not served the environment well

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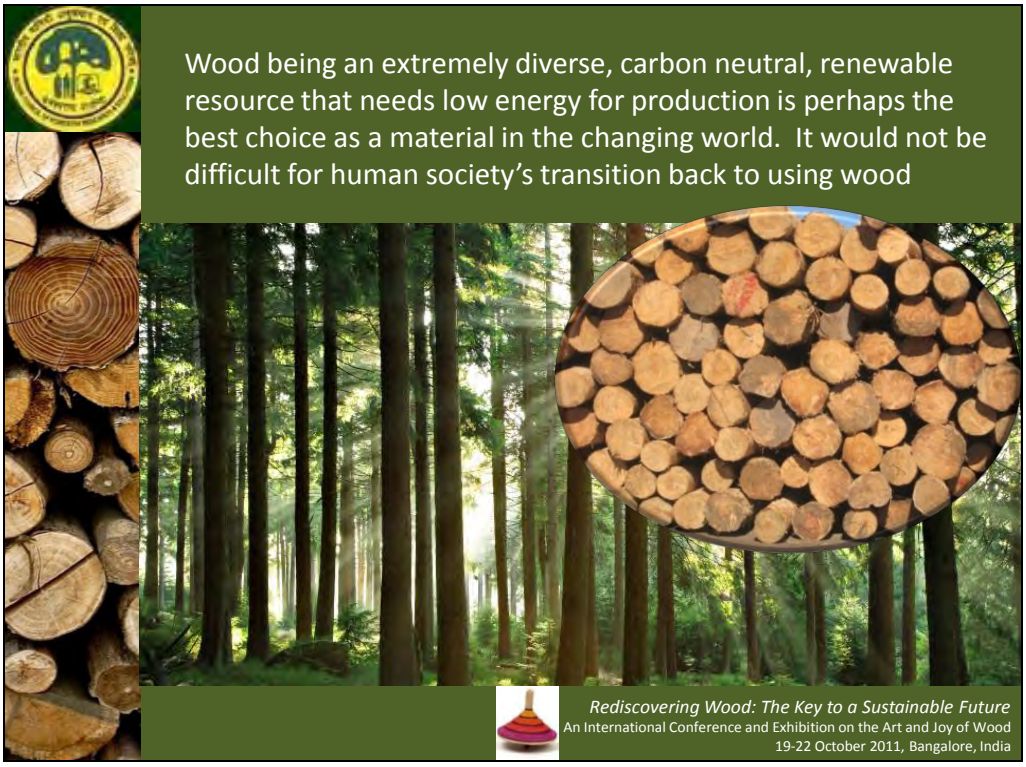
Wood being an extremely diverse, carbon neutral, renewable resource that needs low energy for production is perhaps the best choice as a material in the changing world. It would not be difficult for human society's transition back to using wood
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If art and joy has to come back in India, we should be meeting the demands of people and developing appropriate technology by balancing various demands in a green manner.
One should remember that increasing the use of wood can be a major force in increasing tree planting, therefore increasing greening of the country
However, policies have to designed carefully. Areas for conservation and production have to be clearly set aside after considering the actual availability and demands in the country. Sector-wise industrial requirements need to be met within the country.
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Policies should encourage wood industries, specially the traditional sector. Research and development in these fields should get priority. Technologies already available in the advanced nations need to be adopted.

There is a need for a synergy between the environmentalists and the forest department to develop a holistic approach for conservation and sustained development

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Sound technologies in several areas of wood science are required in this country…

To overcome problems like degradation, dimensional instability, processing defects

To develop new wood-based materials, composites…

Enhance efficiency in harnessing energy from wood

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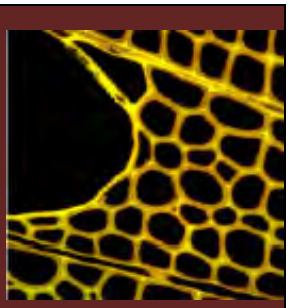
Some of the developments in this regard at IWST, Bangalore are…

WOOD WEATHERING

The focus is on characterizing surface degradation due to biotic and abiotic factors, and developing coatings or chemically modifying surfaces for minimizing weathering



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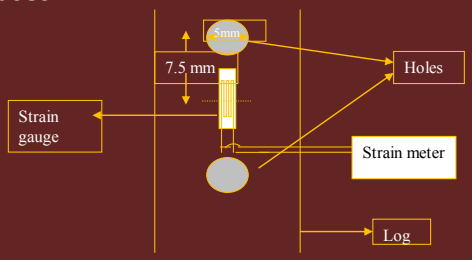
GROWTH STRESSES IN WOOD

Pioneered this work in India for measuring stresses in standing trees

Developed and standardized strain measuring tools and methods for alleviating stressing before processing

It is a major problem in species like *Eucalyptus* when used as timber. The research provides opportunities for putting eucalypts to many alternate uses.

Eucalyptus log showing effects of release of stresses



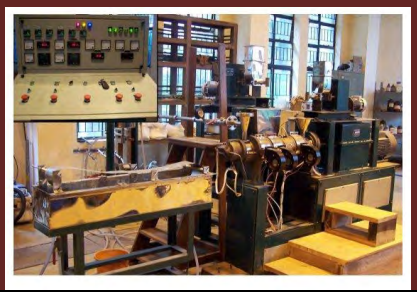
Configuration of holes and strain gauges to measure longitudinal growth strains in trees

WOOD-POLYMER COMPOSITES

Pioneer of this work in India

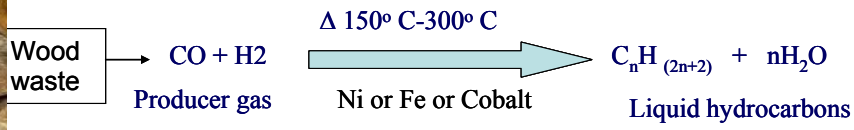
Wood chips, bamboo fibres and nano cellulose have been blended into thermo-plastic composites

The results have been highly encouraging and 2 patents have been filed



Biodiesel from wood wastes

The Institute has taken a new direction in the country in production of synthetic biodiesel from producer gas using wood wastes. This technology will overcome the problem of compressing producer gas for transportation and efficient utilization.



Change in perception of people is crucial to the development of forests and meeting industrial needs

In certain situations, wood is considered as primitive, as a stone-age material...

...in certain others, wood is considered as a rich man's material. Cheap substitutes have pushed wood to an elite category

Both versions have not been good for wood and for the environment

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For all this to happen…

India needs to get back its past glory – when there was a true appreciation of

ART and JOY of using WOOD

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GROW WOOD, USE WOOD…

…TO SAVE THE ENVIRONMENT

…TO GREEN THE LANDSCAPE

…TO TAKE THE NATION FORWARD

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