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A Comparative Study of Hungarian and Indian University Students' Attitudes Toward Forestry

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Abstract – Attitudes toward using wood as a raw material vary greatly, from anti-logging and anti-felling propaganda to the propagation of wood use. This study examines attitudes toward wood, trees, and sustainable forest management in two distinct cultures – India and Hungary. Our questionnaire survey findings indicate that sustainable forest management is considered more important in India than in Hungary and that environmental education is more widespread in India (40 %) than in Hungary (19 %). Over 30 % of people in both countries do not plan to keep wood-related traditions or customs. Indian students lean more toward discontinuing the wide use of wood than Hungarian students do. However, anti-logging/anti-felling propaganda is more widespread in Hungary (85 %) than in India (62 %). Passing wooden tools to the next generation shows a decreasing trend, which is significant from a carbon sequestration, carbon storage perspective, and climate protection. The study findings suggest that keeping wood-related traditions and customs should be strengthened in both countries through environmental education.

wood / use of wood as a raw material / attitudes related to wood / sustainable forest management

Kivonat – Egyetemi hallgatók bizonytalan attitűdjei a fával, faanyagokkal, erdőgazdálkodással, fakitermeléssel, fatermékekkel és fenntartható erdőgazdálkodással kapcsolatban a keleti és nyugati kultúrákban: összehasonlító tanulmány India és Magyarország között. Óriási bizonytalanság tapasztalható a fa alapanyagként való felhasználásával kapcsolatos attitűdökben: egyrészt a fakitermelés- és fakivágás-ellenes propaganda, másrészt a fahasználat propagálása áll szemben egymással. Arra voltunk kíváncsiak, hogy mi a különbség a fáról, a faanyagról és a fenntartható erdőgazdálkodásról való gondolkodásban két különböző kultúra, India és Magyarország között. Kérdőíves felmérésünk eredményei azt mutatják, hogy Indiában sokkal fontosabbnak tartják a fenntartható erdőgazdálkodást, mint Magyarországon, valamint az, hogy Indiában (40 %) elterjedtebb a környezeti nevelés, mint Magyarországon (19 %). Mindkét országban több mint 30 %-uk nem tervezi a fához kapcsolódó hagyományok vagy szokások megtartását, ami azt sugallja, hogy a fával kapcsolatos hagyományokat meg kell erősíteni. Az indiai hallgatók úgy gondolják, hogy a fát a magyarokhoz képest nem szabad tovább széles körben használni. Megállapítottuk továbbá, hogy Magyarországon elterjedtebb a fakitermelés-ellenes propaganda (85 %), mint Indiában (62 %), és hogy csökkenő tendenciát mutat a faeszközök következő generációnak való átadásának szándéka. Ez utóbbi a klímavédelemhez hozzájáruló szénmegkötés és széntárolás szempontjából fontos. Ezek az

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eredmények azt sugallják, hogy a környezeti nevelés részeként mindkét országban erősíteni kell a fával kapcsolatos hagyományok és szokások megőrzését.

fa / faalapanyag felhasználása / fához kapcsolódó attitűdök / fenntartható erdőgazdálkodás

1 INTRODUCTION

Experts recommend using wood as widely as possible (Forest Products Laboratory 2010; Herzog et al. 2012; Winterbottom – Busch 2008). At the same time, forests protect the soil and climate (Sun – Vose 2016, Hundecha – Bardossy 2004). Forests also provide physical and mental renewal (Selhub – Logan 2012, Williams 2017) livelihoods (Nagy 2023). Sólymos (2014) formulates proposals to mitigate climate change effects, emphasizing the role of trees and parks in big cities by measuring climate change effects via carbon sequestration. Forests also produce raw materials, energy, and food. In sum, forests play a critical role in providing various ecosystem services, which are categorized into provisioning, regulating, supporting, and cultural services (Costanza et al. 1997).

The present study focuses on sustainability and environmental protection from a comparative perspective in a wood use context. Our research has two motivations: to consider the functioning of the changed Earth system as a warning of today's global and local problems and to examine uncertainty in attitudes toward wood use among university students in Hungary and India. Our comparative questionnaire study provides data on how young adults feel about wood use, wood raw materials, and how conscious they will be as users of wood raw materials in the future. The thinking, mentality, knowledge, opinions, and attitudes of the younger generation play a pivotal role in climate protection. Therefore, we explored these domains in two disparate cultures. Sustainability and climate protection in the present context require more than tree growth; they also require people growth through education.

The study topic is timely and relevant because media and conservationists frequently convey misleading information about forest management, the work of forestry professionals, and wood as a raw material (Folcz 2013, Kováts-Német 2010). Highlighting the uncertainty in attitudes about forests and the theme of wood in the context of renewable energies, Qu et al. (2011) found that Chinese students had a positive attitude toward renewable energy in general but a slightly less positive attitude toward forest bioenergy. Amberla et al. (2010) also reported that most of the public in Finland and Turkey hold a skeptical rather than positive view of reporting. Hartl (2008) notes that teacher training participants in Hungary observed that wood use as an industrial raw material and natural resource is absent from public thinking. According to the Hungarian National Forest Strategy 2016–2030, the wider and multi-stage sustainable use of harvested timber in the wood industry helps reduce climate change effects. As per the Strategy, wood products must be used for energy recovery at the end of their life cycle. Replacing fossil fuels with wood is beneficial in the long run. Trees gradually bind carbon from the atmosphere, ensuring that wood energy will be climate-neutral in the long term (National Forest Strategy 2016–2030). Therefore, an uncertainty in recent decades is the growing concern about global deforestation. Excessive timber extraction can negatively impact the environment and ecosystems (Donato et al. 2011, McNeill 2011, Paquette-Messier 2010). However, "excessive extraction of timber" refers to removing timber at a rate that surpasses the ability to regenerate naturally. The term "excessive extraction of timber" may be subjective because it lacks a clear and universally agreed-upon definition. Subjectivity arises from the fluidity in defining what "excessive" means, which can be contingent on several factors such as ecological conditions, societal needs, and legislative frameworks (FAO 2018).

Excessive over-harvesting can lead to many negative consequences, such as deforestation, forest ecosystem degradation, biodiversity loss, soil erosion, and altered water cycles. When extraction rates exceed the growth rates, it threatens forest sustainability and can have broader ecological impacts. The concept is often associated with unsustainable forestry practices and is of significant concern to environmental conservationists and the forestry industry, which seeks to maintain long-term productivity and sustainability.

A utilization rate as a percentage of the annual volume increment provides a more objective measure than the term "excessive extraction of timber" because it permits a scientific and balanced evaluation of timber harvesting practices. This metric aligns the economic interests of the timber industry with the imperative of environmental sustainability, ensuring that extraction does not exceed the natural capacity to regenerate (FAO 2018, Lund 2007).

The "circular economy" concept represents an ambitious paradigm shift toward sustainability, focusing on closed-loop systems where resources such as wood are reused, recycled, and recovered. It promotes innovation in design, business models, and consumption practices to reduce waste and environmental impacts (Ellen MacArthur Foundation 2013, Geissdoerfer et al. 2017, Kirchherr et al. 2017). Applying this concept to wood products, allowing for energy recovery at the end of their life cycle, exemplifies the potential integration of the circular economy into various industrial sectors. The "circular economy" concept is a shift from the traditional linear economic model, which typically follows the "take, make, dispose" pattern. In contrast, the circular economy aims to minimize waste and utilize resources by creating closed loops within the industrial system, emphasizing the need for a more restorative and regenerative approach to production, consumption, and waste management.

The deterioration of forests as timber sources (e.g., FAO 2020), rapid population growth, and land use changes, i.e., the encroachment into nature, also affect the use of wood raw materials (Foley et al. 2005, Meyfroidt et al. 2013). Concerns about wood materials, wood extracts, and the use of wood substitutes are increasing (e.g., Schimleck – Adebayo 2019), resulting in competition between wood products and wood substitutes. Examining the global impacts of wood as a building material compared to brick, aluminum, steel, and concrete buildings, Buchanan – Levine (2000) concluded that wood buildings require much lower process energy and release lower carbon dioxide emissions than other building materials. Gerencsér (2021) also recommends wood because of its low weight, favorable strength, and the minimal energy required to produce wood construction material. She argues that the transition to non-wood materials would result in increased energy consumption and carbon dioxide emissions. Industries that replace wood products with other materials believe their products have environmental benefits, which further increases uncertainty in public thinking (e.g., Durugy 1996, Kováts-Németh 2010 from a Hungarian perspective).

Stout et al. (2020) showed that the current generation does not possess solid knowledge about the wood products industry and its basic concepts. The study demonstrated that the 18–20 age group had a stronger overall opinion of the wood industry. Hence, addressing this age group is worthwhile because their future perceptions and opinions are more positive toward the wood products industry. Polzin – Bowyer (1999) also observed great uncertainty regarding university-student knowledge of forests and wood products. They found that forest and wood product knowledge is incomplete and based on misunderstandings. Outdoor environmental education is one method to fill these knowledge gaps. Prokop et al. (2007) found a notable positive increase in student attitudes toward biology three days after a field trip. Molnár (2018) and Pryor – Bowman (2016) demonstrated that preserving tradition is a vital base for sustainable development because it helps relay knowledge to future generations (Molnár 2018). Therefore, the present study incorporated wood-related traditions and customs into the research questionnaire.

Previous research conducted in Hungary showed that students who received environmental education are more sensitive toward wood use than students whose training excluded the subject (Nmarné Kendöl 2019). However, significant teacher training deficiencies exist in Hungary (Kárász Imre ed. 2002). In India, folk theaters help raise environmental awareness in rural India through forest preservation themes (Kabbinahithilu et al. 2022). Since environmental education conveys knowledge, we included it in our questionnaire.

Wood use in India and its relation to the National Forestry Policy (Government of India 1988) is an intricate topic involving various aspects, including environmental sustainability, economic growth, and social implications. As in Hungary, extensive use of wood has led to deforestation and environmental degradation concerns. The dichotomy in public opinion in India focuses on the need for sustainable growth and forest conservation. Some believe in promoting wood as a renewable resource, while others are concerned about adverse biodiversity impacts. There are also economic concerns. The wood industry contributes significantly to the Indian economy, offering employment and supporting various downstream industries. Therefore, the tribal and rural communities that depend on forests for livelihood are often at the intersection of the debate on wood use.

India's National Forest Policy (Government of India 1988) recognizes the importance of forests in environmental stability and ecological balance. The policy's primary principles encompass the following points: (1) Assuring the crucial role of forests in ecological equilibrium. (2) Safeguarding the nation's extensive biodiversity and genetic constituents. (3) Providing for the subsistence requisites of tribal and rural demographics. (4) Executing measures to curb soil erosion in the catchment vicinities of water bodies. (5) Aspiring to induct at least one-third of India's land area to forest or tree cover. (6) Fostering community involvement in forest stewardship and communal forestry initiatives. (7) Advocating for the sustainable employment of wood and overseeing wood-centric industries (Government of India 1988).

The present study explores the contrasting perspectives of Western (Hungary) and Asian (India) countries regarding wood, trees, wood products, forestry, and sustainable forest management. Guided by the underlying motive of climate protection, this research analyzes the influence of environmental education and identifies areas that require further development. This investigation is marked by its novelty, as no previous comparative studies *between Western and Asian countries* have been conducted to discern differences in perceptions concerning the importance of utilizing wood and wood-based materials among students. However, admittedly, differences in perceptions have been shown in international comparisons, for example, between Finland and the US (Amberla et al. 2010) or, most recently, between Italy and Turkey (Paletto et al. 2023).

The differential rates of deforestation between Western and Asian countries could be influenced by variations in the perceived value of wood and wood-based products. Understanding these differences could help formulate international policies and recommendations for sustainable wood utilization and forest management.

The study has three primary objectives: first, to determine whether student perceptions of wood and wood material usage vary; second, to assess student knowledge and proficiency in "wood and wood use" as it relates to sustainable development; and third, to promote wood as a raw material, contributing thereby to climate protection. Additionally, in an explorative vein, the study considers potential differences in attitudes toward using wood and wood raw materials, future tree planting intentions, recycling of damaged wooden tools, and the intention to replace damaged wood with wood. The exploratory nature of the study is reflected in the absence of specific hypotheses.

2 MATERIALS AND METHODS

2.1 Participants

The study was conducted in both countries simultaneously to ensure a synchronous perspective of attitudes and knowledge. Primary data collection was completed in 2023. Participants were undergraduate and postgraduate university students belonging to the middle class. We are aware that socioeconomic factors might confound the results. However, we were interested in the knowledge conveyed to students who might or might not have been exposed to environmental education classes. One university was chosen from each respective country. These selected universities have a broad appeal, drawing students from diverse geographic regions spanning a range of cultural backgrounds. While the study encompassed students from various academic disciplines, it is noteworthy that none of the participants specialized in fields related to forestry or natural resource management. The sole inclusion criterion for participation was native language fluency. No additional exclusion criteria were applied.

Random sampling was employed to minimize bias. Classifying students according to their study programs presented challenges, as the specific majors and degree programs offered in Hungary and India differ. The snowball sampling method was excluded since it may induce biases such as homogeneity bias, selection bias (limited control over the selection process), or lack of independence in the sample. All participants provided informed consent before participating in the study. The participants were not compensated financially for their study participation. However, they received course credit as a token of appreciation. Participants were recruited through flyers and email lists of the two universities. The Indian students were of Indian origin, while the Hungarian students were of Hungarian origin.

2.2 Materials

In the absence of a standardized questionnaire on the subject matter, the current study developed a purpose-specific structured self-completion questionnaire (for the questionnaire items, see Appendices). To enhance questionnaire validity and reliability, we engaged in iterative revisions guided by feedback from two domain experts in each participating country, thus addressing face validity. Subsequently, we refined the questionnaire based on their input. These subject-matter experts also conducted an assessment to ascertain the comprehensive coverage of the domain of wood use within the questionnaire, affirming content validity.

Subsequently, we conducted a pilot test of the questionnaire on a sample of ten students in each country to identify and rectify potential issues, including linguistic comprehensibility and participant familiarity with the five-point Likert-scale (1=totally disagree, 5=totally agree), before its implementation in the actual study. Given the nature of our questionnaire, which measures stable opinions and factual responses (c.f. Appendices for item details), we abstained from conducting a test-retest reliability analysis. Furthermore, we intentionally refrained from performing an internal consistency reliability analysis, as our items were intended for separate statistical analysis, and no thematic constructs were predefined.

The language of the informed consent was written in the participant's native language and was adjusted to Indian English for the Indian cohort and proofread by three Indian students in the case of the Indian survey. The informed consents were drafted in compliance with the stipulations outlined in EU legislation, encompassing elements such as the study's objectives, potential risks and advantages associated with participation, and the assurance of confidentiality regarding participant data.

Ordinal items within the questionnaire were measured on a 5-point Likert scale, aligning with the grading systems employed in both participating countries (with 5 indicating "strongly agree"). The questionnaire items, along with the results derived from inferential statistics, are

presented in the Appendices, maintaining the order of presentation as observed in the experimental procedure.

2.3 Procedure

Data was collected online using *Google Forms*. Participants were briefed about the general purpose of the study and provided with an informed consent form delineating the study's objectives, the data collection methods, and the confidentiality safeguards. After reading the form, participants provided written consent to proceed. The informed consent form for the two versions of the questionnaire was written in English and Hungarian. Participants were informed that the data would be handled confidentially and that they had the right to withdraw from the study even after submitting their responses without any penalty.

Participant details, such as age range, gender, and study program, were first collected for scientific reasons. Participants completed the questionnaire during regular classes as part of the course requirement. Explicit instructions were disseminated to ensure that the questionnaire was to be completed independently, without external consultation. Participants were informed that their responses would be received and analyzed in a manner devoid of evaluative judgment. Participants were explicitly instructed to provide authentic responses, regardless of whether these responses deviated from conventional norms. No time constraints were imposed, allowing participants to proceed at their own pace. We made sure that the participants filled in all the items of the questionnaire, or else they could not proceed with the questions. The items, which can be seen in the Appencices, were not randomized, since no order-effects of the items could emerge. Filling in the questionnaire took approximately 10 minutes. All data were anonymized and coded numerically to ensure confidentiality. The datasets were stored in encrypted files accessible only to the principal investigators, that is, the authors of the study, in accordance with ethical guidelines (APA 2019).

2.4 Statistical analyses

For the statistical analysis, we used R-Studio (Rstudio Team 2020). The minimum number of participants needed for the study is 110 per country based on sample size calculations provided by the G*Power software (Faul et al. 2009) given the following criteria: two-tailed Mann-Whitney U test, d=0.5, power=0.95. These criteria yielded 110 participants per country.

Country (Hungary and India) served as the binary independent variable in our analyses, with the questionnaire items as the dependent variables. Mann-Whitney U tests were run given the ordinal scale and the non-normal distribution of data. These tests were conducted using the Holm-Bonferroni correction given the high number of comparisons in the item analyses. Each item was examined separately to determine potential differences between the two countries. We were also interested in the parallels between the two countries; therefore, non-significant results are also informative. The Mann-Whitney U test results are in the Appendices (*Table 2*).

After the Mann-Whitney U tests, we employed the Conditional Inference Tree method as an exploratory inferential statistics framework developed by Hothorn et al. (2006). We aimed to enter all the questionnaire items as potential predictors and examine which were most closely related to the response variable, Country. We examined which items or item best explains the difference between Hungary and India. For a brief introduction to Conditional Inference Trees, see, for instance, Levshina (2020). This decision-tree technique models the distribution of a response variable using a high number of independent variables (i.e., items). One of the strengths of this statistical approach is that this model allows for the entry of more independent variables than traditional statistical procedures. Another strength is that it avoids overfitting the statistical model (Hothorn et al. 2006).

This model also provides cut-offs on every significant independent variable. In this way, we can learn about the hierarchical structure of the independent variables explaining the response variable, Country. For example, a cut-off of 4 on a 5-point scale means that we can split the sample into two subsamples. The higher a predictor variable is in the tree hierarchy, the more weightage it has in explaining the response variable. Predictions at the so-called terminal nodes labeled 'y' give the proportions of the two levels of the factor on this route, with 'n' denoting the number of observations. We employed the *party* R package to perform the analysis (Hothorn et al. 2006). To reduce the type I error, we used Bonferroni correction with a minimum criterion of 99%. In the "Results" section, we introduce the Conditional Inference Tree model and, subsequently, emphasize the findings, focusing on three key items of interest.

3 RESULTS

We received data from 231 participants. The Indian sample contained 85 females and 32 males, for a total of 117 participants. The Hungarian sample included 102 females, 11 males, and one person diverse, yielding a total of 114 participants (see *Table 1*). For the sample size calculation, see Section 4.2.).

Data from Hungary or India did not show normal distribution (Kolmogorov-Smirnov test, $p<0.001$). Age groups differed significantly in the two countries ($\chi^2=9.907$, $p<0.001$, see Table 1). The distribution of participants differed in the two countries regarding study program ($\chi^2=72.931$, $p<0.001$, see Table 1). Likewise, gender distribution (see *Table 1*) differed markedly in the two countries ($\chi^2=12.764$, $p<0.001$). However, these differences do not influence the conclusions given the standards in the curriculum: participants in both countries were exposed to the same syllabus during their school years and are exposed to the same media content presently. Hence, given their homogenous socioeconomic status and exposure to the same syllabus, differences in study programs would not affect their attitudes and response behavior. *Table 2* of the Appendices illustrates the item-level descriptive statistics for the ordinal variables along with the Mann-Whitney U tests. *Table 1* contains the distribution of gender, age groups, and study programs of the participants in the two countries.

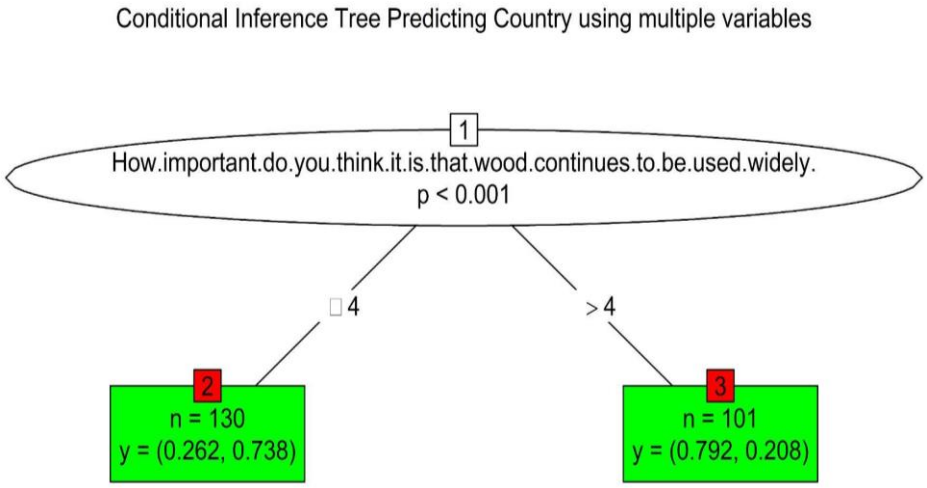

Figure 1. Conditional Inference Tree Predicting Country (Hungary and India) as response variable in this analysis in the entire sample of 231 participants. All variables, excluding gender, were entered in the analysis (a total of 22 items). P-values are Bonferroni-corrected. The item "How important do you think it is that wood continues to be used widely?" with a cut-off of 4 on a 5-point scale proved to be the only statistically significant predictor of Country. The predictions designated by "y = …" indicate probabilities.

Table 1. Distribution of gender, age groups, and study programs of the participants in the two countries. Number indicates column-wise percentages (%).

	Hungary	India
Gender		
Female	89.5	72.6
Male	9.6	27.4
Diverse	0.9	0
Age groups		
20-25 years old	67.5	81.2
26-31 years old	6.1	7.7
less than 20 years old	2.6	2.6
more than 31 years old	23.8	8.5
Study program		
Commerce	6	36
Humanities	16	41
Natural sciences	2	2
Other	76	21

Nominal associations were examined employing Chi-square tests on the item "How many environmental protection books do you have at home," see Appendices (*Table 4*). This item is presented separately from the other nominal items because it has four levels. For the results of the other binary nominal items, see Appendices (*Table 3*). Given the non-equidistant nature of the levels of this variable, we treated this item as a nominal variable.

We were interested in discovering which item(s) is most strongly associated with Country. To this end, we ran Conditional Inference Trees and entered 22 questionnaire items as potential explanatory variables, excluding gender, study program, and age group. The item "How important do you think it is that wood continues to be used widely?" with a cut-off of 4 on a scale of 5 points proved to be the only predictor of Country out of the 22 items (p<0.001, Bonferroni-corrected, cut-off=4, statistic=77.573, see Figure 1). Out of the entire sample of 231 participants, there are 130 for whom it can be predicted that if they score <=4 on the item mentioned, there is a 26.2 % probability that they are from India (see terminal node 2, *Figure 1*), which in turn implies that there is a 73.8 % probability that these participants are from Hungary (see terminal node 2, *Figure 1*). The left number represents the probability or prediction for Hungary, while the number on the right represents the same for India. The left branch of the tree explains and predicts cases who scored <=4 on the scale for the item.

Consistent with this result, the Mann-Whitney U test on the same item showed the highest difference, with Hungary (mean=4.61, median=5) scoring much higher than India (mean=3.25, median=3), displaying a difference of 2 points in median (see Appendices, *Table 2*). Because Mann-Whitney U tests could not point to the item most intimately related to Country, the Conditional Inference Tree analysis has an added value to our investigation.

In sum, we observed that the two cohorts can be most efficiently differentiated based on their perspectives regarding the widespread utilization of wood (see *Figure 1* and *Table 2* of the Appendices). We now summarize the three key findings of our survey based on the following three questionnaire items: "How important is sustainable forest management to you?" (blue bar representing the item in *Figure 2*), "How important do you think it is that wood continues to be used widely?" (green bar representing the item in *Figure 2*), and "Would you like to use such a wooden object in your home? (grey bar representing the item in *Figure 2*). For the descriptive and inferential statistics of these items, see *Table 2* of Appendices. We consider these question items to be the most important in our survey because wood materials play a significant role in sequestering carbon, which can significantly mitigate

climate change impacts. *Figure 2* illustrates the differences in these three items between the two cohorts.

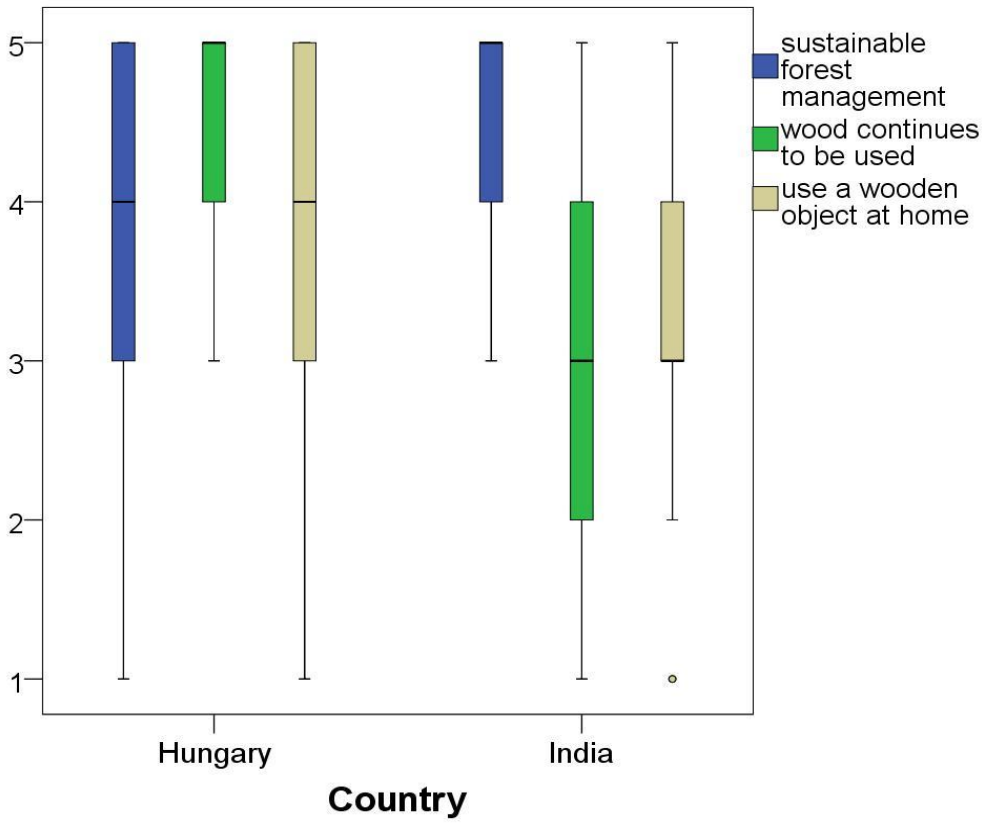

Figure 2. In the bar plot, three pivotal items are presented, categorized by country (Hungary and India). The y-axis represents the ordinal scale, with the x-axis denoting the grouping variable, 'Country'

4 DISCUSSION

Traditionally, wood in India served various purposes, including cooking, woodworking, and furniture construction. However, the transition to natural gas for cooking and steel for furniture has been noticeable. Nonetheless, wood continues to find extensive use in furniture making and construction. Fast-growing bamboo – a sustainable and cost-effective wood alternative – has gained prominence across industries. The launch of The National Bamboo Mission in India aimed to promote increased bamboo cultivation and reduce dependence on forest wood (Ministry of Agriculture and Farmers Welfare 2019). Furthermore, the government encourages the adoption of reconstituted wood panels and ply boards in furniture production to curtail forest logging. Given the large population, additional policy interventions, particularly focused on enhancing environmental awareness and minimizing wood consumption, are imperative (Koul – Kaur 2022).

Materials like steel, glass, plastic, and natural gas in furniture, construction, and cooking are gradually supplanting wood. Factors such as cost, functionality, and aesthetics influence consumer choices. Notably, coal and natural gas are prevalent choices for cooking and heating. Surprisingly, Indian railways, a substantial wood consumer, shifted from concrete to wooden sleepers for track expansion, citing increased durability and support for heavier locomotives (Ortega et al. 2021, Manalo et al. 2010). However, this transition still impacts

Indian forests, necessitating the conversion of more land for farming, resulting in reduced forest cover and adverse climatic effects, including flash floods and droughts (Patra et al. 2022).

To mitigate these consequences, the utilization of Non-Timber Forest Products (NTFPs) is gaining prominence. NTFPs encompass non-wood products derived from fast-growing trees, bamboo, or similar plants, which do not necessitate tree felling. Approximately 275 million rural, economically-disadvantaged Indians residing in challenging climates rely on NTFPs for sustenance and income (Ahamad et al. 2022). Beyond increased NTFP utilization, elevating environmental awareness and education play pivotal roles in forest preservation (Bamrara 2022).

In the following, we discuss the items individually from the perspective of sustainable forest management. The sight of a sick tree in both countries suggests a shared emotional framework for interpreting environmental degradation because it is a reminder of deforestation. Our findings about this shared emotional schema can be leveraged in the formulation of transnational conservation campaigns, cross-cultural environmental psychology, conservation efforts, public policies, and educational programs such as excursions, forestry programs available to everyone, and practice-oriented workshops given by forestry professionals, among others. The congruence in shared emotions illuminates the potential for constructing an international discourse on sustainable forest management, transcending the Western-Asian barrier. Exploiting this shared understanding could dramatically amplify the impact of conservation initiatives by making them more emotionally resonant and intellectually accessible to a broader audience, in line with the endeavors of the G20 Summit in 2023 (p. 10). Specifically, in alignment with the findings of Gharis et al. (2017), it is imperative to emphasize gender and racial diversity in recruiting forest-related programs.

Scrutinizing public perceptions regarding the vitality of forest ecosystems is pivotal in the sustainable forest management domain. Notably, the empirical data from the Indian cohort revealed a mean score of 3.85, with the Hungarian cohort manifesting a comparable mean score of 3.55. Both values situate in the middle range of the 5-point measurement scale utilized, suggesting that respondents do not exhibit significant emotional despondency upon encountering an ailing tree. This serves as an indicator of an underlying comprehension of forest ecology. Specifically, it elucidates that the individuals are cognizant that the morbidity or mortality of a tree is not inherently detrimental. On the contrary, such occurrences may engender advantageous consequences for the overall equilibrium of the forest ecosystem. When a tree dies, it provides nutrients and habitat for other plants and animals, with the dead wood helping to prevent soil erosion and flooding. In addition, tree death can create an opening in the forest canopy, allowing more sunlight to reach the forest floor, which promotes new tree growth. Respondents were aware of these aspects of forest ecology. These findings align with the recent research conducted by Paletto et al. (2023), which illustrated that Italian and Turkish students similarly possess a substantial understanding of deadwood and its significance within forest ecosystems. Additionally, most respondents in their study share the perception that standing dead trees within forests are aesthetically unfavorable, whereas substantial horizontal deadwood is regarded as aesthetically appealing.

Sustainable forest management acknowledges the natural mortality of trees rather than attempting to prevent all instances of sickness or death. Forestry experts prioritize practices that ensure the ongoing replanting of new trees to replace those that naturally expire. This critical aspect should receive heightened attention in environmental education for younger generations despite our prior findings indicating some understanding of forest ecology among respondents. Forester efforts are instrumental in maintaining the long-term health and productivity of forests for future generations. Our previous result suggests that respondents

grasp the intricate nature of forests as dynamic ecosystems that undergo continuous changes, including the natural tree lifecycle. However, we propose that forestry professionals should place greater emphasis on environmental education on this facet of the forest's lifecycle.

For instance, students could engage in collaborative tree planting initiatives organized by forestry experts, followed by participation in tree care and maintenance activities. These tree-planting programs can align with significant environmental observances and incorporate traditions or customs related to trees, thereby enhancing the affective domain of attitudes.

Participants in both countries observed that wooden furniture is used more frequently in universities – a desirable result in the context of sustainable wood management because wood is a renewable resource. We propose that academic institutions should actively disseminate information to their student bodies concerning the long-term carbon sequestration properties inherent in the utilization of wooden instruments, thereby contributing to atmospheric preservation. In environmental education and other wood-related programs, forestry professionals should also emphasize that wooden furniture should be sourced from *sustainable forests*. The preference for wooden furniture is likely due to both countries having a long history of using natural materials (see, for example, Laborczy – Winkler 2016, for the Hungarian perspective). India's long history of using natural materials such as wood for furniture can be attributed to a confluence of geographical, cultural, and historical factors. India is endowed with a variety of forests, ranging from the temperate forests of the Himalayas to the tropical forests in the South. These forests have provided a rich resource of different types of wood, such as *teak*, *rosewood*, and *sheesham*, known for their durability. Second, traditional Indian homes often incorporate wooden furniture for its ornamental value (Narayan 2009). Third, Hinduism and other indigenous philosophies often consider wood and trees as sacred. For example, the Peepal tree (*Ficus religiosa*) is revered, and its wood might be used for making religious artifacts. This religious sanctity attributed to trees further enhances the preference for wooden furniture (Gadgil – Guha 1993).

Other factors, such as the availability and abundance of wood in both countries, the low cost of wood, and cultural preferences also play a role. Moreover, by using wood furnishings, universities demonstrate their commitment to sustainability and eco-consciousness (e.g., University of Bristol 2023). Furthermore, wood has natural sound-absorbing properties, which can help to reduce noise levels in crowded areas such as lecture halls.

The prevalence of environmental education books is generally limited, with most students owning fewer than five books in both countries. This underscores the necessity for an increased availability of literature covering topics such as forestry, sustainable forest management, and environmental protection. We contend that the demand for more books on environmental subjects is not merely a literary need; it is a societal imperative in sustainable forest management. The multi-faceted impact that such literature can wield — ranging from educating future generations and engaging the public to influencing policy and fostering interdisciplinary research — makes this a pressing necessity. In addition, books can also mobilize the younger generation toward sustainability.

Sustainable forest management is considered significantly more important in India than in Hungary, with a minimum of 3 on the Likert scale in the Indian sample, and a minimum of 1 in the Hungarian sample (i.e., every participant gave at least 3 as a response in the Indian sample, while in the Hungarian sample, the minimum was 1). For the difference in the span of responses between the countries, see *Figure 2*. *Figure 2* shows that the Indian cohort is more homogenous regarding this question item and tends to rate it incredibly important. An explanation for the significantly higher value is that India faces unique challenges in implementing sustainable forest management. Bahuguna (2000) examined India's multifaceted forest management challenges, with a particular focus on the substantial population as a central issue. The author contended that India's burgeoning population has

several adverse implications for sustainable forest management. Firstly, a larger population exerts heightened pressure on land resources, frequently resulting in deforestation to accommodate agriculture, infrastructure, and developmental projects. Secondly, increased population contributes to elevated pollution levels, with greater waste generation posing a threat to forest ecosystems and associated water bodies. Thirdly, the rising population drives up the demand for forest products, potentially leading to unsustainable practices such as increased poaching and illegal logging. In response to these concerns, Bahuguna (2000) advocated for government investments in sustainable forest management strategies like afforestation and reforestation. Additionally, he underscored the importance of public education regarding the significance of forests and the imperative to safeguard them. Our study supports these calls and emphasizes the need for environmental education by forestry professionals.

The land need for agriculture, housing, and infrastructure development motivates illegal logging, which undermines sustainable forest management efforts, another possible explanation for why the Indian cohort might hold this issue as more important than the Hungarian cohort. As per the estimate of the Forest Survey of India (FSI), illegal logging comprises about 20 % of the total timber production in India. Illegal logging is also a major cause of deforestation in India. Second, a sizable portion of India's population depends on forests for their livelihoods. Ensuring sustainable forest management while also addressing poverty requires careful planning, capacity building, and alternative livelihood options, again underscoring the importance of sustainable forest management in India. Third, forest land in India is often owned and managed by government departments, tribal communities, private individuals, and corporations, which hinders sustainable forest management practices. Fourth, India is home to diverse ecosystems and rich biodiversity, which are under threat due to climate change, habitat loss, and invasive species. India has made significant efforts to promote sustainable forest management through afforestation programs, such as the National Afforestation Programme (NAP) and the Green India Mission (GIM), community-based conservation projects (e.g., The Singchung Bugun Village Community Reserve located in Arunachal Pradesh, India), and the implementation of laws and regulations protecting forests (see the forest-related Acts of 1927, 1972, 1980, 1988, and 2006). Two other successful projects in India are the Van Panchayats community-managed forests in Uttarakhand, established in the 1970s to give local communities control over their forests. The Van Panchayats have successfully protected forests and promoted sustainable forest management. The other example is the Joint Forest Management Programme a government-sponsored program supporting community-based forest management launched in 1990 that has successfully involved local communities in forest management.

According to the Food and Agriculture Organization of the United Nations, India has 24.3% forest cover (Food and Agriculture Organization 2020). Hungary's forest wood stock is increasing, and the carbon dioxide sequestration of domestic forests is 3-4 million tons per year, which contributes to mitigating the effects of climate change-inducing air pollution. The amount of forest plantations is 4,000–5,000 hectares per year (Hungarian Forests 2016). Currently, forests cover 22.5 % of Hungary. According to plans, the area covered by forests will increase to 27 % by 2030 (Erdő-Mező Online 2020). In 2019, the Ministry of Agriculture set the primary goal of increasing the area covered with trees in the country and launched the Country Afforestation Program and the Urban Afforestation Program. The program goal is for forests and trees to cover 27 % of the country's territory by 2030, implying that India has a much larger resource to protect and manage sustainably, hence the higher value for the importance of sustainable forest management. According to the World Bank, India has a population of 1.4 billion, while Hungary has a population of around 10 million, entailing that India has a much larger demand for forest products, such as timber, fuelwood, and paper.

The most salient divergence observed between the Hungarian and the Indian cohorts pertained to the questionnaire item, "How important do you think it is that wood continues to be used widely?" The Indian sample exhibited a median value of 3, while the Hungarian sample yielded a median value of 5, consistent with the result of the Conditional Tree Analysis (see *Figure 1*). To observe the variation in response spans between the two countries, please refer to *Figure 2*. *Figure 2* illustrates that the Hungarian cohort exhibits greater homogeneity concerning this question item and generally assigns a higher level of importance to it. Thus, the disparate cultural viewpoints between the Indian and Hungarian populations may be discerned through their respective attitudes toward the prospective employment of wood as a material resource. Excessive or unsustainable wood extraction leads to deforestation, habitat loss, and ecological imbalance in India. Wood usage in India, therefore, needs to be reduced. Another explanation could be the concept of "Sacred Groves," virgin forest areas preserved by local communities in India due to cultural and religious beliefs. These areas are often left undisturbed and are considered a testament to traditional environmental conservation methods in Indian culture. The existence of such practices might contribute to a more cautious attitude toward widescale wood usage (Khan et al. 2008).

In Hungary, a notable challenge pertains to the escalating demand for wood, a sentiment widely shared among Hungarian respondents. This heightened demand for wood can be attributed to numerous factors, notably the robust growth of the Hungarian economy. Wood finds extensive use in thriving industries within Hungary, including the construction sector (a significant wood consumer), wooden furniture manufacturing, packaging (e.g., cardboard boxes and pallets), and paper production, with Hungary being a prominent paper producer.

Furthermore, the rising popularity of wood-fired heating, considered a more environmentally friendly alternative to fossil fuels, contributes to this demand. Importantly, Hungary's heavy reliance on imported natural gas, exacerbated by the energy crisis and the Russia-Ukraine conflict that commenced in February 2022, has resulted in substantial spikes in energy prices. Consequently, wood has emerged as an increasingly appealing choice for heating residences and businesses in winter.

The rising demand for wood has placed significant pressure on Hungary's forest resources. To address this, the Hungarian government implemented an export ban on firewood in August 2022 and directed forestry companies to augment their production. Nonetheless, the effectiveness of these measures in meeting the escalating wood demand remains uncertain. Beyond environmental concerns associated with increased logging, there are apprehensions regarding its social impact. Many Hungarians rely on forests for their livelihoods, and heightened wood demand could result in job losses within the forestry sector.

In response, the Hungarian government actively promotes sustainable forest management practices and explores innovative technologies to enhance wood utilization efficiency. Despite these efforts, the persistent demand for wood will likely pose an enduring challenge for Hungary in the near future. Consequently, the prevailing sentiment among the Hungarian cohort is that wood should continue to be utilized more extensively, considering these complex factors.

Wood utilization in India carries substantial environmental implications. Despite being one of the world's most forested countries, India grapples with significant deforestation challenges. This deforestation stems from numerous factors, including agricultural expansion, infrastructure development, and illicit logging practices. Moreover, the combustion of wood for fuel represents a substantial contributor to greenhouse gas emissions within India. Additionally, the manufacturing and disposal of wood products generate waste materials, such as sawdust and lumber scraps, which can pollute the environment and contribute to climate change. Considering these multifaceted concerns, the prevailing sentiment among Indians is against the continued widespread use of wood.

The G20 Summit (G20 Summit Declaration 2023), held in New Delhi, India, in September 2023, embodied this sentiment through the launch of the Global Biofuel Alliance. The Summit also issued a voluntary call for countries to restore all forest-fire-degraded lands by 2030. Additionally, the Summit advocated for low-GHG/low-carbon emissions, climate-resilient, and environmentally sustainable development pathways, emphasizing an integrated and inclusive approach. The G20 Summit Declaration (5/c, p. 1) also highlights the urgent promotion of Lifestyles for Sustainable Development (LiFE) and the conservation of biodiversity and forests.

Significantly, sustainable alternatives to wood exist in India, including bamboo, recycled materials, and engineered wood products. These alternatives are advocated for their sustainability attributes, such as rapid growth, renewability, and diminished environmental impact. Wood utilization can yield environmental consequences, including deforestation, carbon emissions, and waste generation. The discourse surrounding wood reduction may stem from climate change mitigation, carbon footprint reduction, or the endorsement of circular economy principles. In India, wood retains its substantial cultural, economic, and practical significance across multiple sectors, encompassing furniture, handicrafts, construction, and energy generation. Achieving a delicate equilibrium among these diverse considerations is imperative to foster sustainable wood utilization that addresses environmental imperatives and socioeconomic requisites.

On the item "I feel the positive effects of the presence of trees in my immediate surroundings," the Indian cohort yielded a median of 5, while the Hungarian cohort had a median of 4, indicating that Indians feel a more positive effect of wood. Previous research has also demonstrated that using wood as a raw material in schools positively affects psychological, physical, and mental health (Dadvand et al. 2015; Kuo – Taylor 2004). Specific types of wood are often used in sacred rituals and ceremonies in India. For example, sandalwood is considered sacred, while *neem* wood is associated with purification and protection. Furthermore, due to the diverse climates in India, wood is appreciated for its ability to keep spaces cooler in hot weather and provide warmth during colder seasons.

The observation that Indians are attuned more to the positive effects of trees in their immediate environment can also be scrutinized through the lens of sustainable forest management. This heightened perception of the advantages conferred by trees and wood signifies an implicit understanding of ecosystem services, including biodiversity conservation, carbon sequestration, and air and water purification, among others. Therefore, this perceptual alignment with environmental well-being is potentially a propitious harbinger for adopting sustainable forest management practices within the Indian context.

For the item "The knowledge that felled wood used for raw material takes years to grow back affects my use of wood," in India, we measured a median of 4, while in Hungary, a median of 3, indicating that for Indian students their knowledge affects their wood use significantly more by the regrowth of woodcut as raw material. Indian students who possess more knowledge — whether through formal education or other means — may have a multi-dimensional impact on wood use. Their understanding of sustainability, laws, and scientific methods could make them more inclined to practice or advocate for the regrowth of woodcuts as raw material. Students with a formal education are often better equipped to understand, critique, and improve existing laws and policies related to forestry management in India. Considering that the participants from the Indian sample predominantly belong to the middle socioeconomic stratum, it is reasonable to postulate that they have been recipients of formalized education wherein the subject matter of sustainable forest management was introduced and elucidated.

Responses to the question "Are you planning to plant a tree in your home or garden?" were comparable in both countries, with the respondents recognizing the importance of trees

in mitigating climate change, improving air quality, offering natural shade, reducing heat, and preserving biodiversity. Also, many people plant fruit-bearing trees in their gardens, such as mango in India or apple in Hungary. Planting a tree can be a way to carry forward these traditions and provide educational opportunities in the form of family or school gardens. We observed a mean value of 4.3 or higher, which aligns with the prescribed forest sustainability criteria and the most recent findings from Italy and Turkey (Paletto et al. 2023). Consequently, no further intervention from forestry professionals is necessary for this inquiry.

Hungarian students were more willing to choose new wooden furniture for their homes. In recent years, there has been a growing global trend toward sustainability and eco-friendliness in Hungary. Wood is a renewable resource when sourced responsibly, and it can be considered a more environmentally friendly option than synthetic materials or non-renewable resources. Moreover, in Hungary, the cost of wooden furniture is relatively affordable. This is not the case in India, where the cost of wooden furniture can be quite high. Also, the tropical climate in many parts of India might make the maintenance of wooden furniture more challenging due to concerns such as termites, which affects purchase willingness.

More Indian than Hungarian students would regret forgetting a tree-related tradition or custom. We asked this question because traditional and customary practices offer not just an alternative but an invaluable complement to modern sustainable forest management methods. Recognizing and integrating these traditional systems into mainstream policy, environmental education, and scientific research can engender a more holistic and effective approach to conserving forests.

Concerning the possession of wooden tools or objects, 27.2 % of the Hungarian students and 30.7 % of the Indian students reported owning these. Wooden furniture is available in many styles and designs, making the home unique (Kaputa et al. 2018). In principle, wooden tools can certainly align with the goals of sustainable forest management, but this is contingent on responsible practices at every stage of their lifecycle—from raw material sourcing to manufacturing and finally to consumer usage and disposal. Moreover, constant monitoring and adaptive governance mechanisms are essential to ensure that these practices are indeed sustainable. Specifically, if the wood used for making tools comes from forests that are managed sustainably and certified (*certified timber*) by entities like the Forest Stewardship Council (FSC), this is in line with sustainable forest management (Auld et al. 2008). Another vital aspect is utilizing local wood species since it can reduce transportation costs and carbon footprint, contributing to sustainability. We contend that the latter two facets of sustainable forestry warrant heightened emphasis from the relevant authorities.

Students from both countries would feel sorry if one of their wooden tools went to waste, with no significant difference between the two countries. This result is conducive to the objectives of sustainable forest management. When people feel a sense of loss or guilt over wasting a wooden tool, they inherently place a higher value on wood. This could translate into broader awareness and support for sustainable forest management practices (Brown – Kasser 2005). Second, emotional attachment to wooden objects often encourages care and maintenance, reducing the frequency of disposal and the demand for new wooden tools. This can be seen as an indirect contribution to reducing logging pressures on forests (Gifford – Nilsson 2014). Third, the affective connection to wooden tools might shift consumer preferences toward sustainably sourced and manufactured products, which in turn would motivate industry practices to align with sustainable forest management (Thøgersen 1999).

We found that environmental education is more important in India than in Hungary. India is a highly populated country, with diverse ecosystems and biodiversity. Promoting sustainable development practices, creating awareness, resource conservation, and encouraging conservation efforts and renewable energy sources are crucial for India's long-

term growth. Hungary may face different environmental challenges because it is a landlocked country in Central Europe. While it still faces issues such as pollution and resource management, the scale and nature of these challenges may differ vastly from those in India. Hungary's smaller population of around 9,500,000 people and different ecological contexts may influence the relative importance placed on environmental education compared to India.

We found that anti-logging/anti-felling propaganda is far more widespread in Hungary (85 %) than in India (62 %). Hungary has a relatively elevated level of environmental awareness and activism compared to other countries. The environmental movement in Hungary dates to the 1970s when environmental organizations began to emerge. This heightened environmental consciousness has contributed to a greater emphasis on deforestation. Second, since the fall of communism in Hungary in 1989, concern for environmental issues has increased. In contrast, India faces different challenges, such as air and water pollution, waste management, and sustainable development. Additionally, the considerable size and heterogeneity in educational attainment within the Indian populace may lead to a non-uniform prioritization of forestry-related concerns. To encapsulate, it is plausible that issues such as poverty and social inequality may eclipse environmental matters in the collective consciousness of India. These observations further illuminate the pivotal role media plays in shaping public sentiment, both detrimentally and constructively. We strongly advocate for the critical evaluation and possible censorship of media content about trees, timber, and forestry, given its potential to disseminate misleading information that may obfuscate public perception. On the educational front, we recommend fortifying the environmental curriculum in India by incorporating a greater wealth of teaching materials and content focused on trees, wooden materials, and forestry. Conversely, in Hungary, the integration of environmental education should be amplified across higher educational institutions and various pedagogical platforms, also emphasized by Kendöl et al. (2022), who demonstrated that deepening the relationship with wood is vital for current and future generations.

For the item "Is there an old wood-related custom or tradition – e.g., erecting a memorial tree, tree planting, etc. – still followed in your place of residence?," we could not reveal a difference between the two countries. Consistent with this result, for the item "Do you plan to keep a wood-related tradition or custom?" we did not reveal a difference either. Surprisingly, more than 30% in both countries do not plan to keep wood-related traditions or customs. Because modern technologies and industrialization have brought significant changes to societies in both countries, traditional wood-related practices may not fit into the fast-paced and industrialized life anymore. Second, traditional wood-related practices are often passed down through generations via oral tradition. However, as societies modernize and people migrate, there is a decline in the transmission of traditional knowledge and skills related to wood craftsmanship. Younger generations may not have the same opportunities or interest in learning these skills, leading to a decline in wood-related traditions. The commercialization and globalization of markets also impact the demand for traditional wood crafts or products. Also, in an era of increasing environmental awareness, the impact of deforestation is a growing concern. This leads to a shift in attitudes toward using wood and a greater emphasis on sustainable practices. In addition, it is also conceivable that the decline in wood-related traditions is even an environmentally conscious choice to protect forests.

To illustrate, some ancient wood-related traditions involve cutting trees at certain heights and times to stimulate new growth, known as coppicing or pollarding. These practices can help maintain forest health and productivity in the long term. Wood-related traditions possess inherent sustainability principles that are intricately linked with effective forest management. Therefore, integrating such traditions into modern sustainable forest management protocols could provide robust, adaptive, and socially inclusive strategies for conserving forest

ecosystems. Our finding suggests that wood-related traditions should be strengthened (in the light of the small percentage of positive responses), as these traditions and customs also build the basis of sustainable forest management.

We found that 90 % of students in both countries had wooden objects in their homes/families for a long time. Several explanations present themselves. The extended lifespan of well-crafted, eco-friendly, durable, and adequately sourced wooden objects mitigates the need for frequent replacements, thereby reducing pressure on forest resources (Hoadley 2000). The growing awareness of the benefits of sustainable forest management in both countries motivates households to prefer wooden products sourced from sustainably managed forests (Toppinen et al. 2013). Wooden objects serve as carbon sinks for the duration of their lifespan, making them an ecologically viable choice in the context of climate change mitigation strategies (Skog 2008). Wooden objects can often be more cost-effective overall due to their durability, providing an economic rationale for their widespread ownership (O'Connor et al. 2004).

Regarding the item "I feel the positive effects of the presence of trees in my immediate surroundings," we observed that Hungarian students attach more importance to using a wide range of wood items than Indian students. Hungary has a long woodworking history, and wood is a traditional material used in Hungarian furniture or architecture. Also, wood cost is relatively low in Hungary, making it affordable to use for furniture and other objects.

Wood is a natural resource that takes a considerable time to replenish itself. A tree that takes 30 years to mature can be felled in less than 30 minutes. This knowledge has a significant relation with wood consumption. But contrary to this notion, we found that planting a new tree instead of a mature tree is much more beneficial, as the growing tree binds much more carbon than the "old" tree. People need to be made aware of the three types of forests and the concept of economic forests and certified timber.

Tree-planting ceremonies are often held in Hungary to commemorate special occasions, such as the birth of a child or the opening of a new business. Tree planting is seen a as means to give something back to the environment and make a positive impact on the community. Indian students regret forgetting a tree-related tradition or custom more than Hungarian students. Probably because of the strong connection Indians and the Hungarians have with tree and wood products, they did not like the prospect of throwing out a wooden tool or furniture that broke. Instead, they would prefer to use it in some other way or repair it. Hungarian students showed a strong preference for using such wooden objects in their homes and portraying Hungarian craftsmanship. Hungarian students also have a high interest in choosing a new piece of wooden furniture. This finding can be of importance as it exhibits the increased interest in such products and concerned industries can use the information for their commercial planning.

5 CONCLUSIONS

Our main objective was to find out the factors that determine the attitudes toward wood and the willingness to use wood in these two distinct cultures. People's attitudes, knowledge, and mentality regarding wood and trees have become incredibly important in the era of energy crisis and climate protection. However, there is much uncertainty and confusion in people's attitudes toward wood and trees. By identifying the gaps in knowledge and the level of uncertainty, we can propose future directions in environmental education and culture, for example, and strengthen social capital and cultural capital. To that end, we tested university students in India and Hungary.

In summation, given the objectives and empirical findings of our research study, we advocate incorporating forest management strategies across a broad spectrum of societal strata and media. The active participation of community stakeholders in organized forestry initiatives is highly encouraged. Experts in the domain of forestry, along with universities, faculties, and professional foresters, are uniquely positioned to disseminate specialized knowledge and authentic information pertinent to environmental education on timber, lignocellulosic materials, sustainable sourcing, and the application of wooden instruments. Forestry enterprises are advised to arrange an expansive array of programs and events aimed at enhancing the awareness and understanding of sustainable forest management, as well as the properties and utilities of wood-based materials, among the attendees. Initiatives that permit participants to assume roles as active agents tend to amplify the emotional spectrum, thereby enhancing their engagement. Such an approach is instrumental in bolstering two pivotal domains concerning environmental attitudes toward timber utilization. Specifically, preserving wood-related traditions and implementing tree-planting initiatives are integral components of sustainable forest management. This catalyzes the intended outcome: the judicious, conscious application of wood, thereby rendering a substantial positive impact on climate conservation efforts. The study also has a few weaknesses. First, the study is cross-sectional, which means it cannot establish cause-and-effect relationships. For example, the study found that environmentally conscious people are more likely to have positive attitudes toward wood use. However, people who have positive attitudes toward wood use may be also more likely to be environmentally conscious. Another study limitation is the absence of control for socioeconomic status as a variable. However, we deliberately targeted people who received environmental education during their school years. Despite these weaknesses, the study provides valuable insights into the attitudes toward wood use. Future research on the attitudes toward wood use could focus on intervention studies in environmental education and longitudinal studies that can establish cause-and-effect relationships or on studies conducted in other countries. The findings of the present study can inform public policy decisions about wood use and develop educational programs about the environmental and economic benefits of wood.

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Conflict of interest statement: The authors declare that they have no conflicts of interest.

Data availability: The raw data is accessible within the FigShare repository under the identifier https://figshare.com/articles/dataset/Raw_data_Hungary_and_India/24272386.

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APPENDICES

Table 2. Item-level descriptive and inferential statistics for the ordinal variables for India and Hungary. Country, mean, sd (standard deviation), median, minimum, maximum, range, skew (skewness), kurt (kurtosis), and se (standard error of the mean) are depicted. Results from the Mann-Whitney U tests along with the Holm-Bonferroni-corrected p-values can be seen below every variable. "n.s" denotes non-significant results after Holm-Bonferroni correction.

Ordinal variables	Country	mean	sd	median	min	max	range	skew	kurt	se
How sad are you at the sight of a sick tree?	India	3.85	1.15	4	1	5	4	-0.74	-0.21	0.11
	Hungary	3.55	1.01	3	1	5	4	-0.12	-0.67	0.09
	W=5451, p=0.01248, n.s.									
The furnishings in my college are made of wood rather than other materials.	India	3.21	1.29	3	1	5	4	-0.28	-0.97	0.12
	Hungary	3.49	0.89	3	1	5	4	0.06	-0.45	0.08
	W=7313, p=0.1879, n.s.									
How important is sustainable forest management to you?	India	4.42	0.75	5	3	5	2	-0.84	-0.74	0.07
	Hungary	3.68	1.12	4	1	5	4	-0.61	-0.12	0.1
	W=4127, p=1.045e-07, p<0.001 (Holm-Bonferroni-corrected)									
How important do you think it is that wood continues to be used widely?	India	3.25	1.17	3	1	5	4	-0.1	-0.81	0.11
	Hungary	4.61	0.66	5	3	5	2	-1.39	0.61	0.06
	W=10979, p<2.2e-16, p<0.001 (Holm-Bonferroni-corrected)									

Ordinal variables	Country	mean	sd	median	min	max	range	skew	kurt	se
I feel the positive effects of the presence of trees in my immediate surrounding.	India	4.46	0.84	5	1	5	4	-1.72	3.27	0.08
	Hungary	4.17	0.92	4	1	5	4	-0.94	0.30	0.09
	W=5383, p=0.005082, p<0.05 (Holm-Bonferroni-corrected)									
The knowledge that felled wood used for raw material takes years to grow back affects my use of wood.	India	3.75	1.02	4	1	5	4	-0.26	-0.74	0.09
	Hungary	3.29	1.14	3	1	5	4	-0.26	-0.65	0.11
	W=5234, p=0.003316, p<0.05 (Holm-Bonferroni-corrected)									
Are you planning to plant a tree in your home or garden?	India	4.37	1.04	5	1	5	4	-1.64	1.97	0.1
	Hungary	4.42	1.01	5	1	5	4	-1.87	2.89	0.09
	W=6832.5, p=0.7009, n.s.									
How sad would you feel if a tree-related tradition or custom was forgotten?	India	3.68	1.13	4	1	5	4	-0.55	-0.38	0.1
	Hungary	3.31	1.16	3	1	5	4	-0.14	-0.63	0.11
	W=5398, p=0.009332, p<0.05 (Holm-Bonferroni-corrected)									
Do you believe that the number of wo-oden items (e.g., furniture, utensils, ornaments...) used in your home has increa-sed in recent years?	India	2.88	1.31	3	1	5	4	0.2	-1.06	0.12
	Hungary	2.96	1.12	3	1	5	4	0.12	-0.56	0.11
	W=6981, p=0.5269, n.s.									

Ordinal variables	Country	mean	sd	median	min	max	range	skew	kurt	se
How sad would you feel if one of your wooden tools or furniture broke?	India	3.82	1.08	4	1	5	4	-0.66	-0.24	0.1
	Hungary	3.95	1.03	4	1	5	4	-0.67	-0.34	0.1
	W=7085.5, p=0.3913, n.s.									
How pleasant is it to look at an old wooden object?	India	4.04	0.99	4	1	5	4	-0.67	-0.25	0.09
	Hungary	4.03	1.08	4	1	5	4	-1.23	1.11	0.1
	W=6761.5, p=0.8478, n.s.									
Would you like to use such a wooden object in your home?	India	3.49	1.04	3	1	5	4	-0.1	-0.66	0.1
	Hungary	3.85	1.11	4	1	5	4	-0.85	0.11	0.1
	W=8106, p=0.003277, p<0.05 (Holm-Bonferroni-corrected)									
How willing would you be to choose new wooden furniture for your home?	India	3.36	1.13	3	1	5	4	-0.16	-0.68	0.1
	Hungary	4.04	0.93	4	2	5	3	-0.68	-0.43	0.09
	W=8977, p=2.39e-06, p<0.001 (Holm-Bonferroni-corrected)									

Table 3. Item-level descriptive statistics for the nominal variables for India and Hungary. Responses were "yes" or "no" for each nominal variable. Numbers represent the number of respondents who gave affirmative and negative responses (%).

Nominal variables	Country	yes	no	$\chi 2$	p-value
Did your studies teach you about wood use or forests?	India	40%	60%	12.009	$p<0.001$
	Hungary	19%	81%		
Have you encountered anti-logging/anti-tree felling information in the media or lectures?	India	62%	38%	16.307	$p<0.001$
	Hungary	85%	15%		
Is there an old wood-related custom or tradition – e.g., erecting a memorial tree, tree planting, etc. – still followed in your place of residence?	India	54%	46%	5.1577	p=0.0231 (n.s. after Holm-Bonferroni correction)
	Hungary	68%	32%		
Do you plan to keep a wood-related tradition or custom?	India	63%	37%	0.1629	p=0.6865
	Hungary	66%	34%		
Do you have any wooden objects that have been in your family for a long time (e.g., grandparents' furniture, old objects, etc..)?	India	90%	10%	0.76591	p=0.3815
	Hungary	93%	7%		

Table 4. Item-level descriptive statistics for the nominal variable "How many environmental protection books do you have at home" with country as the independent variable.

Nominal variables	Country	< 5 books	6-10 books	11-20 books	> 20 books	$\chi 2$	p-value
How many environmental protection books do you have at home?	India	82%	15%	2%	1%	11.137	p=0.0004682
	Hungary	63%	29%	4%	4%		