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Natsag Burmaa [1], Tugsuu Ganchimeg [2], Ganbaatar Baasanjav [3]

SUSTAINABLE FOREST MANAGEMENT: CURRENT SITUATION AND CERTAIN CHALLENGES OF THE FOREST SECTOR OF MONGOLIA

Abstract: A goal of the article is to explore the theoretical understanding of sustainable forest management and empirical result of the Mongolian forest sector in regarding to institutional regulatory framework, and human resource capacity. Provides also a discussion of improvement possibilities of forest sector of Mongolia. In the framework of sustainable forest management planning, implementing and controlling procedure shall focus on social, environment and economic pillars tends to meet needs of present and future generations of the nations. Also, forest sector human resource shall tend to sustainability as well as in policy, employment and educational level.

A mixed research design that incorporated qualitative data and quantitative data was used in this study. Interviews and questionnaires were completed public officials, forest user groups' employees and private companies' employees which are responsible for forest planting, afforestation, restoration, nursery, thinning and cleaning. Goal and main focus of the state policy on forest sector of Mongolia, coherence of the public organizations in charge of forestry and forest management in Mongolia, success factors and shortcomings are determined in the discussion part. Human resource capacity shall be provided in all policy, employment and educational manners as well.

Keywords: state policy on forest sector, human resource capacity, institutional regulatory framework

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[1] National University of Mongolia, School of International Relations and Public Administration, Department of Public Administration, ORCID ID: https://orcid.org/0000-0002-0783-7300, email: burmaan@num.edu.mn

[2] National University of Mongolia, School of International Relations and Public Administration, Department of Public Administration, ORCID ID: https://orcid.org/0000-0002-1238-1897, email: ganchimeg.t@num.edu.mn

[3] National University of Mongolia, School of International Relations and Public Administration, Department of Public Administration, ORCID ID: https://orcid.org/0000-0003-2445-0252, email: baasanjav_ue@num.edu.mn

Introduction

Sustainable Forest Management (SFM) is the management of forest which aims to keep balance between social, environmental and economic pillars (Baumgartner, 2019). SFM consists of production of forest goods and services to meet the needs of present and future generations while preserving natural capitals. Globally, forest sector policy tends to protecting and producing. Key policy elements in forest sector tend to a more sustainable economy, a well-rounded forest ecological and relatively developed forestry industry system, in optimizing the forestry structure and promoting industrial development, and upgrading the industrial structure and strengthening the implementation of guidance and regulation on development of forestry industry.

A primary goal of the article is to explore the theoretical understanding of sustainable forest management and empirical result of the Mongolian forest sector in regarding to institutional regulatory framework, and human resource capacity. The article also provides a discussion of improvement possibilities of forest sector of Mongolia. A mixed research design that incorporated qualitative data and quantitative data was used in this study. Interviews and questionnaires were completed public officials, forest user groups' employees and private companies' employees which are responsible for forest planting, afforestation, restoration, nursery, thinning and cleaning. We reached to the following results: there is a weak understanding and configuration of sustainable forest management among stakeholders, there is a weak collaboration between public organizations in charge of forestry and forest management, and there is low capacity and high work load of human resources in all public organizations, forest sector units and private companies (forest user groups) in Mongolia.

The main focus of forestry objectives should be on the development of human resources. Unfortunately, forestry sector policy documents leave the integrated human resource policy unaddressed. Human resource preparation, training and capacity development is not taken care of. Also, whatever human resource policies there are, they are not interconnecting different government organizations, universities, research institutes, forest units and business organizations from the forestry sector. Real needs of the forest industry with regard to human resources are not defined. A clear policy on innovation, technology, professional equipment management and optimal investment is lacking.

Forestry and the 2030 Sustainable Development Goals (SDGs 2030)

Forests are among the world's most productive land based ecosystems and are essential to life on earth. The United Nations Strategic Plan for Forests 2017–2030 (UNSPF) provides a global framework for actions at all levels to sustainably manage all types of forests and trees outside forests and halt deforestation and forest degradation (UN, 2016). The importance of forests to people and the 2030 Agenda for Sustainable Development was emphasized as well in the UNSPF, including among others the amount of forest on the Earth's land area, one of the essential factors providing ecosystems. 25% of the global population depends on forests for subsistence; livelihood, employment and

income generation (see UNSPF p. 1). Although there is no specific Sustainable Development Goal (SDG) titled "Forests", the SDG 15 addresses forestry in a broad spectrum. The integration of forests into the SDG discussion requires all environmental, economic and social dimensions of forests and trees outside forests and their contributions to sustainable development to be recognized. SDG 15 aims to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (UN, 2020). Therefore, the aspects concerning forests are relevant for many of the other SDGs, and the fulfillment of some will have an immediate or long-term impact on forests. However, the relevance of forests is regionally quite different, depending on their integration in the economy and the provision of ecosystem services. Also, the Open Working Group of United Nations Economic Commission for Europe (UNECE) made a proposal in July 2014 through which (i) sustainable forest management, (ii) terrestrial ecosystems' protection, restoration, and promotion, (iii) combating desertification, (iv) halting reverse land degradation, and (v) halting biodiversity loss are aimed (UN, 2015).

Sustainable Forest Management (SFM) is the management of forest which aims to keep balance between social, environmental and economic pillars. Essentially SFM is forest management for the long term: the production of forest goods and services to meet the needs of present and future generations while preserving natural capital (FAO, UN, 2016). Furthermore, related social and environmental problems can be solved by different stakeholders including citizens and individuals (Que et al., 2018). In regarding to the different interest of the stakeholders are different, roles and responsibilities are key indicator of the collaboration within them. Stakeholders are concerned on their past experiences through-out the collaboration (Smulders-Dane et al., 2016). In the framework of SFM, a sustained supply of goods and services shall be met through forest management planning. Between 1990 and 2015, the total amount of the area covered by forest management plans has increased over time and forest management plan has split evenly between production and conservation (FAO, UN, 2016).

Socio-economic benefits from forests are the basic human needs and improvements in quality of life (higher order needs) that are satisfied by the consumption of goods and services from forests and trees or are supported indirectly by income and employment in the forest sector (Domaracká et al., 2020). The socio-economic benefits from forests are mostly derived from the consumption of forest goods and services (FAO, UN, 2014).

Measuring the socio-economic benefits from forests, data collection must focus on people, not only trees. It can be measured by the number of people who use forest outputs to meet their needs for food, energy and shelter and also by the contribution of forestry to gross domestic product. According to the Global Forest Resources Assessment 2015, the amount of the area designated for production in the low income countries hold around 100 million ha which was the one sixth of that in the high income countries (FAO, UN, 2016).

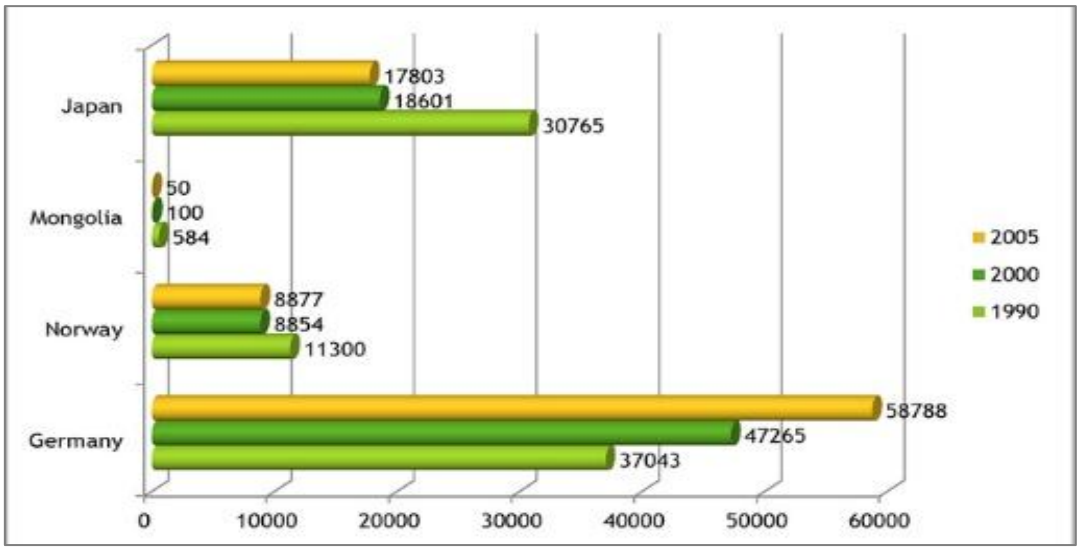

Fig. 1. Forest production (amount of timber harvesting) in Mongolia compared with other countries, in m3

Source: MNET and Forestry Policy and Coordination Department information, 2016

The Food and Agriculture Organization of the United Nations (FAO) organizes the World Forestry Congress (WFC) which is the largest and most significant meeting of the world forestry sector and has been organized every six years since 1926. In the conference, forest issues including international dialogue, socio-economic and institutional aspects, and forest policies are addressed among the international forest experts. The last IV Conference – "Forest and People: Investing in a Sustainable Future" – hold in 2015 in Durban, South Africa. The following vision of forest and forestry is suggested in the Durban Declaration (Word Forestry Congress XIV, 2015), namely, forestry is a way to achieve the 2030 SDGs and a sustainable future 2050 and beyond.

Globally, forest sector policy tends to PROTECTING AND PRODUCING. Key policy elements are that the forest sector has a key role to play in (i) the transition towards a more sustainable economy, (ii) a well-rounded forest ecological system and relatively developed forestry industry system, (iii) in optimizing the forestry structure, and promoting industrial development, and (iv) upgrading the industrial structure and strengthening the implementation of guidance and regulation on the development of forestry industry (UNECE, 2016).

Furthermore, forest sector regulations are standardized by the norms, guiding principles and standards. Those are listed below not including industrial and production standards:

- the 10 principles of the United Nations Global Compact,
- UN Guiding Principles on Business and Human Rights,
- the ILO Declaration on Fundamental Principles and Rights at work,
- IFC Environmental and Social Performance Standards and Guidance Notes,
- national parks and nature reserves, High conservation value forests,
- the UN Convention on Biological Diversity and the related Bonn Guidelines or Nagoya Protocol Forest Stewardship Council,

- program for the Endorsement of Forest Certification.

In order to achieving Sustainable Forest Management, forest sector human resource shall tend to sustainability as well in policy, employment and educational level. For all three factors, sustainability related aspects shall be intensively introduced and considered. The reality, however, is more complicated. According to the Global Forest Resources Assessment which includes 234 countries and territories, in 1990 the world had 4128 million ha of forest; which had decreased by 2015 to 3 999 million ha. This is a change from 31.6 percent of global land area in 1990 to 30.6 percent1 in 2015. At the same time, the report states that the attention paid to sustainable forest management (SFM) has never been higher: "More land is designated as permanent forest, more assessment, monitoring, reporting, planning and stakeholder involvement is taking place, and the legal frameworks for SFM are being widely adopted" (FAO, UN, 2016). In fact, forest area change can be described as a process of gain (forest expansion) and loss (deforestation). Natural forest area changes as an indicator of natural habitat and biodiversity dynamics shows a net loss of some 129 million ha of forest between 1990 and 2015, representing an annual net loss rate of 0.13 percent. The good news is that the rate of annual net loss of forest has slowed from 0.18 percent in the 1990s to 0.08 percent over the last five-year period. Between 2010 and 2015 there was an annual loss of 7.6 million ha and an annual gain of 4.3 million ha per year, resulting in a net annual decrease in forest area of 3.3 million ha.

Forestry employs 13.7 million formal workers, about one percent of the total world employment, and its commercial output represents about 0.4% of world GDP (International Labour Organization, 2011). Despite the relevance of these figures, the workforce is probably much larger as the sector is characterized by widespread informality, especially in developing countries. Forestry work is often characterized by high degrees of informality, land tenure issues, undervalued by markets, workers outside of traditional social protections, low wages, and hazardous working conditions. Debates over forests tend to dominate aspects related to biodiversity and ecological issues and neglect the human and labour dimensions, including the function of forests for society together with the role and conditions of forest professionals. However, renewed interest in the issue in light of the Sustainable Development Goals (SDGs) provides a unique opportunity to fill the gap in terms of the social dimension of forestry management for once and for all. Forests need to be socially beneficial to contribute to the objective of sustainable development, and in parallel, benefits derived from the existence and management of forests and accruing to people living in and around them may be a precondition for the conservation of forests.

Globally, the total amount of employment in forestry has declined in 2010. The amount of forest employment decreased in Asia, Europe, and North and Central America; whereas it increased in Africa and South America. 79% of total employees in the forest sector work in Asia, mainly India, Bangladesh and China. Based on data from 29 countries, there are some countries with high numbers of female employees such as Bangladesh, China and Mali (FAO, UN, 2016) in absolute numbers. Moreover, Mali,

Mongolia and Bangladesh had the biggest percentage of female employees in forest sector employment.

Usually, there is a lack of information about forestry sector employment. More specifically, harvesting and silvi-cultural operations, including wood-fuel and non-wood forest production collection is under-reported due to a lack of data, particularly for informal or part-time employment. Internationally, the discussion about employment related to the forest sector focusing on three overlapping categories of forest dependent populations (BWI Position Paper, January 2017):

1. Those engaged in subsistence actions for their livelihoods

There is considerable debate about the role of forests for those engaged in subsistence non-market actions for their livelihoods. Are forest resources a safety net or a poverty trap? Do forests provide protection, nourishment, and cultural advancement and or protection for forest dependent peoples? Are subsistence uses of forests emitters of carbon through the burning of fuel wood or are the carbon emissions of these populations proven to be sustainable over millenniums? Are indigenous cultures and societies end points of sustainable development? Or, are they gaps the development process of the larger culture overlooked or exploited?

2. Those engaged in commercial transactions through informal work for their livelihoods

As with those engaged in subsistence livelihoods there is some controversy regarding those engaged in informal work. Are those engaged in informal work, working to enjoy the flexibility and independence of informal work or are they engaged in survival mode eking out poverty level or below lifestyles? There is no doubt that a clear majority of those engaged in informal work live near or below the poverty level, especially within the forest workforce. Some of these workers are in work that is misclassified by national labor legislation.

3. Those engaged in an employer/employee relationship for their livelihoods.

Traditional development programs envision formal work as a goal in and of itself. There is an assumption that those engaged in formal work are inherently better off than those workers who are not. The real world appears to provide a different set of data. Workers forced into wage labor from many other categories frequently lose access to important safety net resources. Likewise, it is increasingly possible to be engaged in full time formal work and still remain below the poverty level.

As with the categories above the common element that determines whether any work status is overall positive or negative is the amount of control the worker has over their circumstances. Workers in formal employment in countries where it is a common practice to seize and hold their passports (for migrants), or where limits on hours worked, or safety regulations are either non-existent or not enforced may not be in a better position than those engaged in informal work. However, the question whether a person has the possibility to engage in formal employment does depend to a large degree on the availability of and access to a formal education and/ or training that would allow for the systematic build-up and improvement of available knowledge and skills, Also, in the forest sector education is critical.

Forest sector of Mongolia

Mongolia has a territory of 1.566.600 squire kilometers. Forest cover 8.5% of the total land area. Mongolia's forests are under-utilized, vulnerable and forest resources are largely mature forest. On average, forest resources per hectare are small and primarily based on natural regeneration. Mongolia's Sustainable Development Concept 2030 foresees that State Special Protected Areas increase from the current level of protection of 17,4% of total land space to 25% between the years 2016 to 2020, 25% from 2021 to 2025 and 30% from 2026 to 2030.

Fig. 2. The map of Mongolia
Source: Batkhuu et al., 2011

Mongolia will be a country with a steadily increasing per capita income and diversified and stable economic sectors, middle-class dominated, ecologically balanced and with a consistent democratic government.

Sustainable environmental development is the basis for efficient use of natural resources, preservation of the ecosystem, maximization of the benefits of long-term economic growth, sustainable development of society and the improvement of the quality of human life.

Principles for sustainable environmental development

- ensure community involvement and community participation in sustainable environmental development,
- efficient and sustainable use of natural resources,

- promote better technology, build low-waste, sustainable production and use,
- establish and maintain environmental rehabilitation at the international standard,
- developing environmentally friendly approaches and good practices.

Principles for sustainable economic development

- encouraging high productivity and advanced technology into every sector and promoting innovative products, production and services,
- promoting natural resource-saving, greenhouse gas EMISSIONS and low-waste industries,
- maintain an efficient and economical principle in all areas of economy and society.

Principles for sustainable social development

- the key development indicators are human development based on inclusive growth,
- civil and lifelong education systems are open, accessible and qualified,
- to ensure equal participation in the labor market and maintain a high level of proper employment,
- transfer the value of Mongolian labor to productivity-based compensation and incentives.

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State policy documents that are being implemented in the forestry sector of Mongolia ("Concept of Sustainable Development of Mongolia 2030" Resolution No. 19 of 2016; "The State Policy on Forests" No. 49 of 2015; "Green Development Policy" No. 43 of 2014; "National Program of Special Protected Areas" No. 29 of 1998 and "National Biodiversity Program" No. 325 of 2015; "Combating Desertification Program" No. 90 of 2010; "National Green Belt Program" No. 44 of 2005; "National Forest Program" No. 248 of 2001).

The study (GIZ/INCOSAD, 2017) found that goods and services provided by Mongolia's boreal forests indicated the value of forests to be around 431.5 billion MNT or approximately 150 million EURO per year. However, the economic potential cannot be utilized as state funding for state forestry units is insufficient. This is related to the following reasons:

- there are too few people to run operations professionally and efficiently,
- there is not enough manpower to fulfill the mandatory obligations from relevant laws and regulations,
- persons working in the forest sector have very little motivation to improve their own performance or better their qualifications,
- forest units have not enough financial capacity for improving operations, for example through investments into technology or product development,
- there are no incentives to operate in a transparent manner based with high governance standards,
- there is very little pressure from monitoring and evaluation bodies to perform in the best possible way.

For example, through investments into technology or product development, there are no incentives to operate in a transparent manner based with high governance standards, there is very little pressure from monitoring and evaluation bodies to perform in the best possible way.

The forestry units in provinces and the capital city Ulaanbaatar manage forest according to their forestry management plan for sustainable use, restoration and afforestation forest management policy framework. According to Article No. 12.2 of the "Mongolian Law on Forest", the Resolution No. 255 from 2012, government can establish state owned and state financed legal entities to harvest timber from forests, build forest roads, and plant trees and seedlings for climate change adaptation purpose. Forestry departments in the provinces, forestry units of soums (administrative unit of Mongolia), inter-soum forestry units, private forest enterprises and forest user groups are main stakeholders in Mongolia.

The legal framework and organizational setup of the forestry sector in Mongolia

The base for the legal framework governing Mongolia's forestry sector is the constitution of Mongolia. It states that:

- Article 6.1: in Mongolia the land, its subsoil, forests, water, fauna and flora and other natural resources shall be subject to people's power and state protection,
- Article 6.2: the land, except that is given to the citizens of Mongolia for private ownership, as well as the subsoil with its resources, forests, water resources and wildlife shall be the property of the state,
- Article 17.2: it is a sacred duty for every citizen to work, protect his/her health, bring up and educate his/her children and to protect nature and the environment.

Other relevant legislation, parliament and government resolutions as well as orders issued by MET were added over the years. Since 2010, the Government has issued several resolutions, including:

- the approval of a procedure to incentivize citizens, cooperatives, enterprises and organizations in order to minimize harmful effect on forest and introduce advances methods and technologies,
- the approval of norms,
- procedures for forest management,
- the approval of forest clearance programs,
- the approval of procedures to earmark a portion of the revenues from the forestry sector for environmental protection and rehabilitation measures.

By definition, all forest resources in Mongolia are state property. The MET has primary oversight for forest development and conservation, while aimag and soum administrations are responsible for forest management at the local level. The Law on Forestry 2007 allows for the MET and local government authorities to contract management and use right to private forest enterprises (PFE) and community user groups (CUG). The MET also produced a number of regulations, for example regulations on afforestation, on planning, on organizational funding, the appraisal of cultivated

forests, the purchase of state forest reserves, the procedures to give ownership rights, forest harvesting certificates and certificates of origin and how they are being issued, requitements and operational calculation methods to estimate fees for harvesting wood and firewood from forests, forest registry's registration and reporting forms and procedures how to manage and proper use of non-timber forest resources and last not but least procedures about employing volunteer rangers.

The Law on Environmental Protection adopted in 1995 and the "Law on Forest" from May 17th 2007, are the principle guidelines for the forestry sector. Mongolian parliament, the State Great Khural, has a role to play as it shall define the state policy on forest protection, use, restoration and afforestation, establish the minimum and maximum amount of the forest and steppe fires (Mongolian Law on Forest, 2020) (State Policy of Forest of Mongolia, 2019). The Law on Forest deals with the regulatory framework for forest protection, rehabilitation, reproduction, possession, use and prevention of forest and steppe fires. It also regulates the different roles the Government, the MET, the National Emergency Management Agency, the General Agency for Specialized Inspection, the General Police Department, the Local Government Unit and its Agencies hold with regard to forestry management and oversight.

According to the Resolution No. 49 by the Parliament of Mongolia from May 14th, 2015, the Government's policy on forestry is defined as a "comprehensive economic, social, and environmental issue for Mongolia", in line with the green development policy and human well-being. The document defines the future goals and actions of forest protection, utilization and restoration and forest resources. The following purpose of forest policy was adopted:

- increase forest cover, by raising forest reforestation,
- preserve and protect forest biodiversity,
- increase forest health, vitality and productivity,
- increase forest ecological, economic and social importance.

Article 12 of the Mongolian "Law on Forest" provides for the Government's implementation arrangements, most importantly:

- implement state policy,
- approve the national forestry program,
- plan in annual budgets for expenditures for forest resource protection, restoration and afforestation, as well as road exploration studies,
- develop designs and construction of main roads within commercially used forest zones,
- approve norms and locations of the forestland coverage to be managed by forest units depending on state and reserve of forest and its utilization intensity,
- approve and ensure the enforcement of procedures to estimate damages and losses incurred by forest and steppe fires along with other related regulations including the development of norms for fire extinguishing equipment, taking into account specific conditions of administrative and territorial units. In addition, regulations related to forest fires shall be clearly defined.

According to the article No.13 "Law on Forest", MET is responsible for organizing the implementation of state policies and relevant legislation about the protection, sustainable use and restoration of forests, afforestation as well as to prevent forest and steppe fires and maintain an ecological equilibrium. In regarding to the "Law on Administrative and Territorial Units and Their Management" from December 2006 as well as the "Law on Forests", outline the rights and responsibilities of forestry subjects on capital city, aimags and soum level and outline the rights and responsibilities of District Citizens' Representative Khurals and governors. According to that, they are responsible and forest protection, its use, restoration and afforestation as well as forest and steppe fire prevention. Province and Capital City Environmental Departments shall organize the implementation of the forestry legislation in their area, and report the findings to the aimag and capital city governors and to the State Central Administrative Body. They shall provide professional management of their forestry units and monitor their activities. According to the law they shall submit proposals related to forest activities to the Citizens Representative Khural or to the Governor to find resolutions and submit those to the state central administrative body. Those laws, policy documents and resolutions clearly outline that it is important to establish a "Good Forestry Governance" which comprises of forestry policy, forestry legislation, structure, organization and operation of forestry organizations as well as the involvement of all relevant stakeholders. Also, it indicates that in terms of legal environment constant change occurs, reflecting the generally instable political environment of Mongolia with frequent changes of government. At the same time, the regulations and procedures developed by MET are mostly related to relatively simple operational requirements for daily activities and work instructions for forestry management and cultivation.

Human resource in the forestry sector in Mongolia

In this section current employment situation and education system for the forest sector of Mongolia in line with the relevant policies will be described. Available data for the employment situation in the forest sector are often unreliable and inconsistent. To compensate for the lack of statistical data, for example from the National Statistical Office or the Ministry of Labor, the Employment Office or other designated institutions, INCOSAD developed a questionnaire which was used for interviews with approximately 70 key persons related to the forest sector. Main findings from those interviews are:

As of January, 2018, in total 185 employees work at the different levels of forest administration in Mongolia.

INCOSAD 2017 survey showed (INCOSAD, 2017) that forest units are far low staffed which leads to partly unrealistic work overload.70% of all people interviewed about the human resource situation answered, that the current level of personnel was very inadequate. 55% of all respondents answered that it would need three to four more people in order to fulfill all task in a proper manner. 19% answered that it would need five to six people more, and 3% said it would need at least seven or more people. Two thirds of all respondents answered that it would need forest engineers and rangers. One

considerable factor influencing the work load is the daily tasks of employees: Human resource capacities are tied up by doing 50% of administrative work, 20% of inspection and control, 20% of advisory services for forest user Groups, which leaves only 10% for actual forest work (INCOSAD, 2017). Furthermore, forest sector employees want to refresh and improve their knowledge. For instance, 60% of all respondents answered that they would want to have a two-week short-term training; 38% of all respondents answered that they would need short term professional training where they could get professional certificate; and 55% of all respondents answered that they would need exchange experience with other forest units' employees.

Table 1. Number of personnel in forest administration

Type of forest organization	No. of entities	Total no. of employees
Ministry of Nature Environment and Tourism (121), Department of forest policy and coordination	1	10
Forest Office at province level	9	26
Forest Unit of Soums	2	6
Inter-soum Forest Units	34	143
Total		185

Source: Report of the Mongolian Environmental Situation 2015-2016, p.131 Forest Research and Development Center's Information, 2016; Interview with employees of Soums and Inter-soums' Forest Units

As of January 1st, 2018 there are over 1150 registered private forest companies with licenses for the following partial activities of forest management.

Table 2. Main operational areas of forest sector enterprises, 2018

Types of licenses	Number	Percent
Forest inventory and management planning	23	2%
Research and fight pest infestation and disease	36	3.1%
Forest thinning and cleaning	436	38%
Protection and use of non-timber forest products	125	10.9%
Afforestation and reforestation	467	40.5%
Commercial selective cutting	63	5.5%
Total	1150	100%

Source: Ministry of Nature Environment and Tourism of Mongolia, 2018

Altogether, they employ about 8000 persons. Around 2100 forest professionals work in the forest professional enterprises (FPE) in Mongolia. Out of those, 1.088 employees graduated from vocational education and training centers.

On the other hand, a total of 1281 forest user groups employ a total of 23.496 persons. On the local level, in Selenge Aimag, 3.180 persons work in forest user groups. From them, only 205 persons have a forest profession, which is only 6.4% of all persons. In summary, the work load of current employees in the forest sector, especially in forest units, is so intense that they would like to have extra staff. The operational types of forest sector enterprises are mostly concerned with tree nursery, afforestation, reforestation, and forest thinning and cleaning.

To define the forest sector-human resource situation in Mongolia, the employment status and educational training and skills situation shall be elaborated. The government's policy on forestry is reflected in the resolution No. 49 of 2015, mainly:

- support the creation of a unit, incubator center, small and medium-sized enterprises in the fields of reforestation, forest protection, wood processing, and processing technology at the universities and research institutes,
- build a foundation for strengthening the facilities and technical base of forest universities, colleges and vocational training centers, and providing full support and assistance in improving the capacity of teachers and establishing training system for forestry experts, professionals and workers.

Under the State Policy on Forestry, the following training institutions are operating. These are: training and production laboratories at National University of Mongolia (NUM), Mongolian University of Life Science (MULS), and Mongolian University of Technology and Sciences (MUST); dendrology laboratory, forest ecosystem monitoring laboratory, forest genetic and eco-physiological laboratories, Central Asian Regional Fire Management Center, training and research center at Batsumber, Tuv aimag, tree nursery training-research center at Bayanchandmani, Tuv aimag, tree nursery and forest mechanization center at Mandal, Selenge aimag.

In the national profession-reference booklet, the forest sector specialists that are being trained in the universities are being defined as forester, forest researcher, forest advisor, forestry engineer, and forest mechanics.

There are 11 universities that train forest specialists in Mongolia. Specifically, forest science, environmental science, ecology, environmental protection technology, forest production technology, forestry and forest management, forest planting and forest engineering, remote sensing study professionals are being trained at NUM and are tending to the field of forest research. In contrast, forest engineers and mechanics are being trained at MUST and forest students at MULS are more into ecological and environmental protection field. Other universities including International University of Ulaanbaatar, Mongolian National University (private institution), Khovd University, Eco-Asia Institute, Gazarchin Institute, Maral Institute train specialists for ecology, environmental protection, forestry, gardening, environmental studies and management in forest sector.

The number of specialists trained in these higher education institutions has been around 470 each year in the last 6 years. The ratio is nearly 50:50 male and female. For instance, in 2017 were 248 female and 221 male graduates out of 469 and almost 90% of them are graduating with Bachelor's degree. About 10% have a Master´s degree or a Ph.D.

The highest number of students are graduating from MULS, and then NUM and MUST in order. Unfortunately, the employment ratio shows that approximately 70% of the graduates are not finding work in the forest sector but work in different areas. For example, in between 2012 and 2014 the employment rate within the forest sector was about 25% – 29%, and from 2015 to 2017 it was only 12% – 17% (Statistical data, Ministry of Education, Culture, Science and Sports, 2018). This means that each year around 400 forest graduates are not finding employment in the forest sector. However, there are no statistical data and registrations of unemployed forest professionals on the labor market. Many of the graduates are being employed in other sectors like mining, however, the trace survey must be conducted annually.

Universities that train forestry specialists in Mongolia recruit according to the enrollment policy under quota which are approved by the Ministry of Education, Culture, Sciences and Sports of Mongolia (MECSS). According to the quota, approximately 450 – 500 people are being recruited annually.

The following are the reasons why the forestry sector's employment status is poor:

- remote workplace,
- low salary,
- availability of professional jobs is poor,
- forest industry competition is high,
- scope of the labor market is low.

Vocational education is professional knowledge and skills, and labor and communication culture formulation acquired by organized training to meet the needs of specific activities (Law on Vocation Educational and Training of Mongolia, 2021). According to the Vocational Education and Training Law of Mongolia, a vocational training center is the organization where people obtain vocational education and training. Technical education is organized training to meet the needs and management of technical and technological processes (Law on Vocation Educational and Training of Mongolia, 2021). This type of technical education training institution is a technical college and it can have a vocational training center in its structure.

The adults over 18 years old earn 1-2 professional ranks by studying one year in a vocational education center. In contrast, the graduators of 9th grade of a high school earn 3-4 professional ranks by studying 2.5 years in a Vocational Training Center. In the vocational training centers, students learn classes combined technique of theory and practice, specifically 30 – 35% theory and 65 – 70% practice of the program.

In Mongolia, there are 16 vocational training centers preparing forest mid-level skilled forest workers currently. They are: tree planter, forest thinning and logging worker, forestry worker, forest technician and forest user group employee. Overall, 13

vocational training centers participated in this research work except Khovd, Bayankhongor, and Orkhon VTCs.

On average, around 1 or 2 lecturers are teaching full time in the vocational training centers besides Khuvsgul VTC and Eco-Mongol Erdene VTC where 4 and 9 lectures work separately. To awake the interest of employees to work in Vocational Education and Training center continuously, an allowance equal to 10 months basic salary paid once in every five years by the employers (Law on Vocation Educational and Training of Mongolia, 2021).

Between 2013 and 2015, the number of VETC graduates slightly increased from 209 to 329 before it went down to 163 in 2017. Their gender ratio is 48% male and 52% female. To compare with university graduates, the VETC graduates have a high employment rate with 70% over the last five years.

The National Vocational Education and Training Council of Mongolia is a non-permanent organization which provides equal participation of the public and private sector in the implementation of state policy on vocational education and training gives guarantee on working in a stable environment (Law on Vocation Educational and Training of Mongolia, 2021). The Ministry of Labor and Social Protection of Mongolia heads the Council and representatives from both public and private sectors including Ministry of Finance of Mongolia, the Vocational Education and Training Centers' Association and Employers' Association of Mongolia sit on the council. Unfortunately, the MNET is not participating in the council. The council has the following duties (Law on Vocation Educational and Training of Mongolia, 2021):

- discussing and evaluating long, medium, short term of vocational education and training,
- coordinating the activities of vocational education and training centers and employers and administrative authorities,
- informing and presenting development of professional national system in the forest sector, implementation of law and regulation of vocational education and training relation of Mongolia,
- discussing and evaluating national classification and description of occupation, professional standards, content of vocational education and training at national level.

Both, national classification and description of occupation and Ministry of Education, Culture, Sciences and Sports of Mongolia approved indexes through forest workers' preparation and training at VETCs. There are certain majors that are required under both classifications including forest technicians, forestry worker, Forest thinning and logging worker, mechanics, technicians and operator of wood processing equipment. In contrast, some professions like lumberman and log-man are prepared just under National classification and description of occupation. In practice, there is a trend that the majors required under both classifications are trained more often.

In the academic year of 2015 – 2016, totally 20.961 students had enrolled into VETCs and it decreased to 18.967 in 2016 – 2017 (General Agency of Labor and Welfare

Services, 2018). Reason of declining numbers of people studying at vocational education and training centers are:

- there are less obstacles to university entry,
- grant for the VETC students was shut down,
- lack of interest due to lower reputation of forest employees,
- less encouragement on VETCs staff,
- slight coherence between Ministry of education, culture, sciences and sports of Mongolia, Ministry of Labor and Social Protection of Mongolia, and MNET, and
- lack of exchanging the experience between the VETCs.

In 2015/ 2016, the Ministry of Nature, Environment and Tourism (MNET) conducted knowledge based short-term trainings in promoting sustainable development, green development concepts and fundamental principles. These trainings incorporated recommendations from international organizations and their programs and over 190 training sessions were organized for around 7.800 people. Trainings included experts from the environment and tourism sector, representatives from government organizations, media workers, civil society organizations and local communities. Also, 96 trainers were trained, as a result. In the case of Selenge aimag, trainings were organized by the Ministry of Nature, Environment and Tourism, University of Life Science, the Aimag Governors' Office, the Aimag Nature, Environment and Tourism Department, Local Property and Statistic Offices. These government agencies had trainings for aimag's forest office, forest units, forest user groups and forestry companies. These trainings were conducted from 1 day to 1 month and 2 – 11 times a year.

The other training providers are NGOs. The trainings were directed to provide knowledge about environmental protection technology, sustainable tourism in Mongolia and inclusive economy, national assembly of eco-schools, and local partnerships for gender equality. Mostly the aimag's forest office employees participated in these trainings.

Trainings were also provided by universities: the National University of Mongolia, Mongolian University of Science and Technology, University of Life Science and International University of Ulaanbaatar. The trainings were wood cutting, rangers, gardening, forestry, ecology, forest fire, pests control, tree nursery, afforestation, forest conservation and protection. These trainings are organized by requisitions of government, non-government organizations, private sectors and individuals.

Short-term trainings for Mongolian forest sector employees are organized by MNET, Aimag Governor's Office, Aimag Nature, Environment and Tourism Department, NGOs and international organizations. Short term trainings are provided by professional organizations, however, most of them are (about 80%) dedicated to forest units, which means by the fact that the forest workers' involvement is insufficient. On average, 25 – 30 trainings are conducted per year in one aimag. In addition, universities provide short-term training based on their need, according to our survey. In terms of frequency, they offer short-term training 1 – 2 times per year.

At present, the leading universities of Mongolia are preparing forest specialists as professionals, including the National University of Mongolia, Mongolian University of Life science, and Mongolian University of Science and Technology. However, the educational tendencies are in different directions. Specifically, NUM works more on forest research, whereas Mongolian University of Life Science is into the conservation and ecological protection. The Mongolian University of Science and Technology leans towards forest engineering. The environmental, ecological and rehabilitation specialists are being prepared at some other private institutions. To make the practical forest training more effective, the above mentioned universities could do it in cooperation with professional forest units or forest companies. With this approach, a theoretical and practical complementarity could be achieved. By 2020, in addition to the current forest programs, it is possible to add interdisciplinary courses such as forestry policy and planning specialist, business related forestry courses or to expand them as new classes. Also, courses like forest animal biology and forest pest protection can be trained in developed countries, exemplifying Germany, Japan, and Canada.

By 2025, as the forest sector expands, it would be advisable to open up some new forestry related subjects/ classes as for example forest law, forest IT, forest equipment engineer, and forestry economist. Some courses such as agro-forestry and forest renewable energy specialists could be educated externally in highly developed countries. Also, the continuous improvement of the quality of existing curricula should be undertaken in an orderly manner including the accreditation process at the national level. The goal should be the internationally accepted accreditation of higher forest education by 2030.

By sustainable development education goals from 2020 to 2025, current professional programs should be enhanced further and courses such as equipment technologist, forest and landscape management, natural resource conservation, urban forestry and forest production management should be added or expanded.

To achieve the goal, current skill sets of existing employees are necessary to be assessed and extra training and re-training are required. Meanwhile, the forest officials can increase the number of skilled workers, intensify their professional skills and competitiveness, and open more opportunities for students to acquire dual occupations, therefore, the achievement will be internationally recognized by 2030.

The short-term forestry training can be divided into two main sections: the training for the policy makers and the training for the implementers. The reason is that the decision makers are usually appointed politically, meaning, they are mostly not the professional ones. To comprehend the fundamental significance of forestry, they should take specific trainings, essentially, forest law and legislations, long and med-term forest development policies, strategies, and implementations. The further training should include international and national level of forest standards, international market and competitiveness, coordination between sectors and subsectors, forestry human resource policy, forest technology, innovation and investment. If you see Mongolian present situation, we would say that the officials should take an active training on political responsibility and ethics.

Secondly, the implementers (forest units and forest user groups) must have training according to international standards, forest related laws and legislations, labor safety, in addition to development of business plans and the development of small and medium enterprises.

The most important implementers are the forest companies and they must be provided with targeted training because they should enroll their forest workers short term advanced trainings regularly. These include: up to date methods and techniques for forestry operations, handling of work tools and equipment's, first aid, and labor safety.

Sustainable use, restoration, and afforestation of forest sector are regulated by state policy on forest sector of Mongolia is the main success factor. However certain shortcoming elements has been revealed in Mongolian forest sector. Those are:

- weak legal regulatory framework for addressing frequent changes in forest sector of Mongolia that contains norms and standards,
- weak organizational structure of forestry units / they interfaces with other state institutions such as local province administrations or the Central State Administrative Body/,
- there is low capacity of public sector human resources at the local administrative level, and
- educational and vocational system are not able to train required employees in forest sector of Mongolia.

To conclude, the sustainable development concept of Mongolia stipulates the sustainable use of natural resources, preserving ecosystem balances and aiming at long-term benefits, which would in turn enable inclusive economic growth, foundation of sustainable development of the society and create the basis for improving the quality of human life. Also, sustainable forest management shall contain protection, restoration, and promotion, (iii) combating desertification, (iv) halting reverse land degradation, and (v) halting biodiversity loss are aimed efficient use of natural resources.

Main focus of the state policy on forest sector of Mongolia, coherence of the public organizations in charge of forestry and forest management in Mongolia, success factors and shortcomings are determined in the discussion part. Those are among others:

- state policy on Forest management and coherence of the laws and regulation in forest sector,
- role and responsibilities of the main stakeholders in forest sector of Mongolia,
- revenues and revenue distribution in the forestry sector,
- staffing and human resource capacity and their work load,
- required skills and knowledge of the forest sector employees.

Based on those discussion points certain recommendation are given in considering on success factors and shortcomings of forest sector of Mongolia.

Furthermore, human resource development must be addressed in the framework state policy of forest sector by defining needs of forest sector employees, being in line with public institutions, universities, research institute, forest units, private enterprise and forestry organizations, and by penetrating innovation, technology, equipment and

optimal investment policy. Most importantly, proactive and broad training on all levels constitutes the precondition for ensuring sustainable forest management in Mongolia.

The Sustainable Development Concept of Mongolia stipulates the sustainable use of natural resources, preserving ecosystem balances and aiming at long-term benefits, which would in turn enable inclusive economic growth, foundation of sustainable development of the society and create the basis for improving the quality of human life. The forest sector goals and objectives are well reflected at the level of policy programs and documents of Mongolia such as the "Sustainable Development Concept", "State Policy on Forests" and "Green Development Policy". The purpose, objectives and principles of state policies are in line with the goals and objectives of international sustainable development, but they don´t systematically address the implementation. Implementation policies, planning, results and control issues are inadequate. If there will be no real policy addressing implementation issues, it is likely that goals and objectives will only remain on paper.

Currently, the educational and vocational systems are not able to train marketable experts who could work inter-sectoral. In this case, it will be extremely hard to achieve the goals and objectives of the sustainable development policy. Graduates of forestry related education will work in government organizations, non-governmental organizations, the private sector, universities, research institutions, international organizations, projects and programs. However, the results of the survey conducted by INCOSAD on aimag and Capital City level found that the HR capacities of forest services and forest units are rarely used for actual forestry work. Only 10% of total capacities go into that area, 50% are absorbed by administrative work, 20% for inspection and control work and 20% for advisory services for forest user groups.

Existing capacities in forest companies should be further evaluated in order to determine required trainings and re-qualifications on the basis of their daily work and anticipated HR needs. Considering the topics of training organized for forestry workers the survey found that 80% of respondents answered that they have the need for specialized training based on new technologies.

The MNET provides permission for logging of around 1 million m^3 annually for the last 8 years (Ministry of Environment and Tourism, 2013-2014; 2015-2016). But this volume has not been reached fully since 2011. In average, only around 65 – 70% has been used for the last 5 years. One major reason is the inadequate situation with regard to human resources, i.e., the people working in the sector. In order to promote and encourage high productivity and advanced technologies, innovative new products, production and services, and ensure that they are efficient and economical, it needs a clear focus on quality education and training of forest sector employment.

In Mongolia, the potential maximum for harvesting could be 6 million m3 per year, which would require a total of 6150 professionals working in the forest sector. Compared to today´s number, this would mean an additional 5060 persons. In order to increase the number of skilled workers in the forest sector, it is best to make a policy to provide systematic training to forest workers and students in the field of vocational skills and specialization. As a result of these measures, it will increase the

competitiveness of the forestry sector, enhance the competitiveness of professional and technical qualifications, and develop a national accreditation certificate to match the salary level. It is imperative to implement a policy to improve the value of professional workers in Mongolia.

It is also necessary to implement a reward policy and professional payroll policy that create a system of employee engagement. It is possible to transform the value of Mongolian labor into productivity and to create internationally recognized competitive forestry professionals. The INCOSAD research study came across some criticism that too often non-specialists are being employed by political appointment. Therefore, it is strongly recommended that relevant government agencies and decision-makers take strong measures against civil servants who do not comply with the law or are obviously under-qualified.

As of January 2018, there are 57 academics in Mongolia who hold Ph.D. degrees related to forestry. Since 2012, only 3 scientists have received a doctoral degree on forestry. Therefore, it is time to focus on scientific research. In addition, only 30% of university graduates in forestry and approximately 70% of the graduates of vocational schools have gone into professional occupations in the forest sector. That means the Mongolian forestry sector needs a general human resource policy. There is no integrated database of human resources in the forestry sector. Human resource policy planning is unclear.

MNET, MECS, Ministry of Social Welfare and Labor, and General Department of Labor and Social Welfare Services (Labor Exchange) are weak in coordinating between sectors which has a negative impact on human resources planning and training of the professionals. This includes:

- the real human needs of the forest industry are not defined,
- human resource policies are not in line with public institutions, universities, research institute, forest units, private enterprise and forestry organizations,
- there is no innovation, technology, equipment and optimal investment policy,
- statistics on unemployed people with forestry background are not available to forest sector staff,
- there are very students recruited from forest companies and other business establishments since the training is not in line with market demand.

Barriers for university graduates to enter the forestry sector are an underdeveloped labor market, a lack of professional status, remote work locations, low salaries and poor working conditions. This creates a need to provide a reliable source of guaranteed funding for training and re-training consistent with the basic needs and existing capacities of forestry workers. This will create a strong interest in forest education, empowering people, promoting a salary system, and providing employment opportunities for skilled workers in the forestry sector.

Special attention should be paid to the competitiveness of forest units and professional forestry organizations. To do this, it is necessary to pay attention to the government policy level regarding quantity and quality of forestry professionals. It is desirable to have a professional forest organizational policy to develop, support and

finance competitiveness in the fields of innovation or production, product type and quality, and to compete in free market environment. It is advisable to introduce international quality standards to forest products and forest operations in the forest sector enterprises.

Universities and institutes providing forestry programs need to make sure that the quality of the current programs are in conformity with international standards. New education programs can be developed, with new forestry science programs and modified learning styles. Adopting a students' enrollment and graduation quota would meet the needs of the "Manufacturing-Business-Labor Market" within the policy framework that aligns universities to free market competition. With regard to the framework of coordination between theory and practice in university programs the following should be considered:

- implementation of science-based innovation policies based on University-Business-Manufacturing collaboration, and enabling policy to attract investment from technological companies,
- in order to build a knowledge and innovation network in the forestry sector master's and Ph.D. degree programs based on business needs in biotechnology, finance, and management should be promoted,
- forest universities research results should be prepared in a marketable way to attract investment,
- encourage financing from small and medium-sized enterprises.

Additionally, for subjects such as forest pest protection, forest information, software and agro forestry which cannot be taught in Mongolia, the education of professionals in foreign schools should be made available. The qualification of vocational education and training centers should be strengthened. Firstly, competition should be strengthened and systematically enhanced through better teaching resources, training materials, technology and curricula accredited by national accreditation agencies. Economic incentives for the new students through the granting of scholarships on the level of the minimum wage amount would help to attract new people.

The Mongolian National Council for Vocational Education and Training should make sure, that all relevant actors and stakeholders are heard with regard to professional education, training institutions, employers and ministries. The Council should:

- integrate the professional indexes the Ministry of Education, Culture and Science and Ministry of Population Development and Social Protection,
- assess the capacity of teaching staff at Vocational Training Center, focus on quantity, quality and capacity,
- support the vocational education and training funds and vocational training center funding from state and local budgets and foreign projects, as well as support policy that small and medium-sized enterprises financing,
- provide industrial internships at vocational education and training center and colleges which has the provision of practical training base for internships,
- organize competence training in highly skilled professionals within international organizations and projects,

- improve vocational and professional qualifications of Vocational Education and Training Center's graduates,
- provide combined professional and technical education, and
- develop realistic ability and capacity of professional staff to compete at national and international levels.

The INCOSAD survey clearly revealed that both the requirement and training profiles will have to undergo a continuous process of adaptation. This continuous process of adaptation to changing societal, economic and ecological conditions and requirements constitutes a permanent task for the relevant training and research institutions. Tried and tested basic forestry training must be guaranteed, however, increasing specialization in various fields must also be facilitated at the same time.

Proactive and broad training on all levels constitutes the precondition for ensuring sustainable forest management. The knowledge and skills required for this are imparted in the corresponding training institutions. Cooperation, knowledge transfer and innovation force are success factors for future-oriented, economically and socially relevant forestry trainings in Mongolia.

Conclusions

The main focus of any goals and objectives should also consider the development of human resources. Unfortunately, forestry sector policy documents leave the integrated human resource policy in forestry unaddressed, human resource preparation, training and capacity development is not taken care of. Also, whatever human resource policies there are, they are not interconnecting different government organizations, universities, research institute, forest unit and business organizations from the forestry sector. The real needs of the forest industry with regard to human resources are not defined. A clear policy on innovation, technology, professional equipment management and optimal investment is lacking.

The human resource policy should be prioritized in order to improve cross-sectoral coordination and the legal environment and legal arrangements of the forest sector in Mongolia. An assessment of the capacities of human resources needs evaluation of the forest units, professional organizations, forest user groups and the vocational training centers conducted by independent entities in order take a step-by-step measure to improve capacities. Creating real economic incentives to support the forestry sector is essential to the optimal forestry. Proper structural change is needed for forest sector as such as well as the forest units in order to operate profitably. It is advisable to focus on the training for highly motivated professionals, who are enhanced by employee activation systems and performance rewards. Mongolia should develop a "National Program for Human Resource Development in the Forest Sector". An integrated human resource database of the forest sector is essential to this program. The database should contain the following information:

- demand for the forestry sector,
- marketability of forest sector staff,

- inter-sectoral movements of forestry workers,
- realistic workplace statistical information,
- whether registered at the General Agency for Labor and Welfare Services,
- information working in other sectors, and
- gender indicators.

All this information would well facilitate the policy of providing the labor market with skilled labor for the forest sector.

In view of the many challenges faced by the forestry training institutions and the people working in the forestry sector in Mongolia, international cooperation and the formation of a wood cluster including the area of knowledge creation must find greater prominence. Increased cooperation between the training institutions and the private sector are also in demand. Partnerships with forestry operations and companies and with other organizations working on the ground should be promoted. With regard to the potential expansion of the Mongolian forestry industry, a further increase in the requirements relating to the qualifications held by experts is mandatory. The required skills may be expert-technical, organizational-methodical or social in nature. In addition to the corresponding systematic further development of training programs, more measures in the area of further and continuing training are also in demand. Other aspects comprise of the updating of the skills of teachers and trainers to reflect latest developments, guaranteeing the attractiveness of the teaching profession and provision of possibilities for the exchange of knowledge and experience. Training courses offered should be adapted, a target -group-specific marketing needs to be developed. Through an adequate communication strategy, the attractiveness of forestry professions could be improved.

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