



Forest Policy Report

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Concept for the implementation of a Timber Supply Outlook Study

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About the Project “Sustainable Forestry Implementation” (SFI)

The project “Technical Support to Forest Policy Development and National Forest Inventory Implementation” (SFI) is a project established in the framework of the Bilateral Cooperation Program (BCP) of the Federal Ministry of Food and Agriculture of Germany (BMEL) with the Ministry of Environment and Natural Resources of Ukraine (MENR). It is a continuation of activities started in the forest sector within the German-Ukrainian Agriculture Policy Dialogue (APD) forestry component.

The Project is implemented based on an agreement between GFA Group, the general authorized executor of BMEL, and the State Forest Resources Agency of Ukraine (SFRA) since October 2021. On behalf of GFA Group, the executing agencies - Unique land use GmbH and IAK Agrar Consulting GmbH - are in charge of the implementation jointly with SFRA.

The project aims to support sustainable forest management planning in Ukraine and has a working focus on the results in the Forest Policy and National Forest Inventory.

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1. Identification of key players in forest sector

Forest sector by definition includes institutions, organizations and enterprises dealing with forestry and wood processing. But the list of key players in the timber sector include besides state authorities of different levels, scientific/education and nongovernmental organizations and their associations. Below is mentioned the most important key players in the timber sector by different groups, with a short description of their role and/or responsibilities in the forest sector.

Ukrainian state and local forest related authorities

Ukrainian Parliament. Parliament is responsible for the law-making process. There might be a President', state authority or parliamentarian initiative for the law preparation. There are 3 Committees in the Parliament through which forest sector related laws might be elaborated/supervised:

- *Committee on Environmental Policy and Nature Management* is the main Committee for elaborating/supervising forestry related laws. Among the most important laws which are under consideration the Committee now are the draft Law on Forest Reproductive Resources (9116¹) and draft Law on amendments to certain legislative acts of Ukraine on effective forest management based on close to nature forestry, adapted to climate change, and biodiversity conservation in forests (9516²).
- *Economic Development Committee* is the main Committee for elaborating/supervising all laws related to timber industry. At the moment under consideration the Committee there is the draft Law on timber trade (4197Δ³).
- *Committee on Law Enforcement* is the main Committee for elaborating/supervising all laws related to law enforcement including in the forest sector. At the moment under consideration the Committee there is the draft Law on amendments to the Criminal Code of Ukraine and the Code of Ukraine on Administrative Offences to improve liability for offenses in the field of forestry and combating illegal timber trafficking
- *The Committee on Agrarian and Land Policy* was responsible for forestry related laws elaboration in the framework the past Parliament. Now Committee is responsible only for consultations for the proposed draft forest sector related laws.

Ministry of Environment Protection and Natural Resources is responsible for defining forest policy in Ukraine, preparing normative documents in forestry and supervising forestry activities. There is division for the protection and restoration of forest

¹ <https://itd.rada.gov.ua/billInfo/Bills/Card/41577>

² <https://itd.rada.gov.ua/billInfo/Bills/Card/42333>

³ https://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=72719

resources as a part of the department of strategic planning and sustainable environmental management. There are only 4 persons dealing with forest related normative issues.

State Forest Resources Agency of Ukraine is responsible for implementation of forest policy in Ukraine. Whole list of responsibilities of the State Forest Resources Agency of Ukraine can be found [here](#). After reforming according to a Decree on 7 September 2022, N1003 regional departments of the State Forest Resources Agency of Ukraine have been closed, and interregional departments (new format) have been established. In total, the number of departments with policy implementation function has decreased from 24 to 9. It is worth mentioning that Forest Reserves, National Parks and other forest protection entities which were under the responsibility of regional departments have been placed under the direct responsibility of the State Forest Resources Agency of Ukraine. Besides National Parks and Forest Reserves in the direct responsibility of the State Forest Resources Agency of Ukraine there are projects, scientific, nature protection and other enterprises which are not responsible for SFM implementation.

Local authorities. Responsibilities of different types of local authorities are defined in Forest Code of Ukraine⁴. In 2014 Ukraine introduced a decentralization reform that provided empowerment of local authorities to make independent decisions in the forest sector. However there are still a number of problems caused by the lack of competence.

Other state authorities. There are a couple of other state authorities with control functions in the forest sector – Ministry of Interior Affairs, State Ecological Inspection, Chamber of Accounts etc. Keeping in mind their limited interest in preparing the Timber Supply Outlook Study for Ukraine (TSOSU) we are not providing detailed description here.

Note: There is no state authority dealing with or directly supervising the wood processing industry. Formally it is a task of the Ministry of Economy of Ukraine. As a result no state authority is interested in regulating this sector, elaborating strategy or vision for its development. Partially questions of timber industry developing is considered trough of Ministry of Environment Protection and Natural Resources or State Forest Resources Agency of Ukraine or directly through parliamentarian.

State and communal enterprises responsible for SFM

⁴ <https://zakon.rada.gov.ua/laws/show/3852-12#Text>

The biggest one is the state forest enterprise “Forest of Ukraine”, established according to a Decree on 7 September 2022, N1003 mentioned before. At the moment it conducted SFM on 6.6 mio ha of forests and has 10 regional offices and 33 thou employees⁵. The biggest communal enterprise in Ukraine is Galsillis⁶, but it has no significant influence on forest sector related policies.

Scientific/education institutions

The G.M.Vysotskiy Ukrainian Research Institute of Forestry and Forest Melioration (URIF&FM), is the leading national forestry research center in Ukraine, and the P.S.Pasternak Ukrainian Mountain Forestry Research Institute (UMFRI), is the national research center for mountain forest management. These are the two national scientific institutes responsible for forest-related research and are subordinated to the State Forest Resources Agency of Ukraine.

The research network composed of URIF&FM and UMFRI covers natural ecosystems and forest research plots, some of which were identified over 150 years ago. Nowadays, the network is well-balanced and reflects the whole range of aspects related to the natural, economic and social traits of Ukrainian forests with high-level research programs and outputs. Research at URIF&FM and UMFRI focuses on the following priority areas: development and improvement of forest management; reforestation and afforestation; forest protection; forest breeding, research and conservation of forest genetic resources and forest biodiversity; forest ecology and monitoring of forest ecosystems; agroforestry and forest restoration; forest radiology; game management; economics, organization and management of forestry; and information technology and digitalization in forestry.

Other forest-related research projects are conducted by forest science universities across the country. In relation to forest education, there are 50 educational institutions consisting of 23 universities, 22 forest-related colleges and 5 forest training schools. 13 educational entities provide master’s degrees and 24 offer bachelor’s degrees. The largest forest faculties are based in Kiyv, Lviv and Kharkiv.

Nongovernmental organizations and their associations. Lately there are a quit big amount of forest related nongovernmental organizations and their associations. They also should be presented by following groups:

Forestry related NGO

- *The Society of Foresters of Ukraine* is a non-profit public organization with all-Ukrainian status. The main goal of the Society is to mobilize the public to protect

⁵ <https://e-forest.gov.ua/>

⁶ <http://galsillis.org.ua/>

forests and to promote forestry on the basis of sustainable development and effective management.

- *Central Committee of the Trade Union of Forestry Workers of Ukraine*

Environmental related NGO. Among other important NGO that have significant impact on forest sector policy are:

- *WWF.* Objectives of the WWF-Ukraine concerning forestry include work on virgin, quasi-virgin and natural forests in the Ukrainian Carpathians and Polissia; introducing good management practices for sustainable forestry, including conservation of high value forests; protection against illegal logging; working on the development of legislative recommendations and proposals.
- *Ecology, Law, Human* is working since 1994 aiming to protect the environment, maintain, restore and improve its condition, and providing legal assistance in protecting other human rights, especially those related to environmental issues.
- *Ukrainian Ecological League* aims to improve the environmental situation in Ukraine, to create the foundations of balanced (sustainable) development in Ukraine, to form a new environmental outlook, and to raise the level of environmental education and culture of citizens.
- *Ukrainian Nature Conservation Group* is established in 2014 by Ukrainian biologists aimed to protect Ukraine's wildlife. They are dealing with creating protected areas, working to improve legislation, identify cases of illegal destruction of nature, and conduct educational work.
- *ForestCom*, which is a community of experts and activists who unite their efforts to fight illegal logging, mitigate climate change and improve the forestry sector in Ukraine.

Wood processing related NGO. There are quite a number of small NGO and their associations at national and regional level. Among national associations should be mentioned:

- *European Business Association.* The Association was founded in 1999 with the support of the European Commission in Ukraine. Since then it has become the most influential and largest business association in Ukraine that addresses issues important to Ukraine's investment climate. Forest sector related issues are considered by the Woodworking and Furniture Committee, established in October 2015. It brings together companies with experience in the woodworking and furniture industry involved in the local production of relevant products in Ukraine.
- *Association of woodworking enterprises of Ukraine* is a voluntary association of enterprises, individuals, analysts and scientists and was established in 2022. The main goal is build favorable conditions for the development of the forest industry.

- Association "Mebliderevprom". The Association of furniture and woodworking enterprises of Ukraine "Mebliderevprom" was founded in December 1998. Today, the Association unites leading companies for the production of cookers, furniture and other woodworking products.
- *Ukrainian Association of Woodworking Equipment*. Under the auspices of the Association it conducted yearly the industry exhibitions "Woodworking" in Lviv and Lisderevmash in Kyiv.

Most regional NGO and their associations are present in the Carpathian region. Among the most powerful and active should be mentioned:

- *Association of woodworkers and loggers of the Lviv region*. Chair Mykola Kogut.
- *Association of woodworkers of Zakarpattia region*. Chair Olexander Muntianov
- *Association of logging and woodworking enterprises of Chernihiv region "Chernihivlisderevprom"*. Chair Podkorutov.
- *Other important NGOs*. Among other important NGOs that have significant impact on forest sector policy are:
 - *FSC and PEFC* directly related to forest certification processes.
 - *Office of Effective Regulation*. This NGO is an independent expert and analytical centre, a key platform for united reformist organizations. It was established in 2015 as a non-governmental, non-profit organization to assist the Government in implementing medium- and long-term economic reforms to improve the business environment in the face of political instability. Forest sector related issues are considered along with agriculture problems.
 - *FORZA* specialize in developing multifunctional forestry and promoting close-to-nature forestry, supporting sustainable tourism and community development, energy efficiency and energy conservation, climate change adaptation, strengthening the competitiveness of wood-based industries and improving strategies and policies. Mostly it is active in the Carpathian region.
 - *All-Ukrainian Association of local communities*. The organization was established to promote best practices of modern and innovative community management, as well as to protect their legitimate rights and interests. It also aims to ensure the practical implementation of reforms and positive changes in each community. All of this is achieved through ongoing dialogue and cooperation between local governments and all stakeholders who contribute to the implementation of local government, decentralization and sectoral reforms. Since its establishment, the Association has already united about 790 communities from all regions of Ukraine.
 - *Forest related printed media (Dereboobrobynyk, Forest and Hunting Magazine etc.)*

There are also a couple of hunting related NGOs but they have limited interest in preparing TSOSU and we are not providing a detailed description here.

2. Short assessment of key actors potential needs and interests in preparing Timber Supply Outlook Study for Ukraine (TSOSU)

Table 1. Assessment of key actors demand and type of interests in using TSOSU

Entity	Is the information required?	Possible target use of the information	End user
Ukrainian Parliament	Yes	As support information that could influence law-making process	Secretariat of the Committees and/or advisers to Parliamentarian
Ministry of Environment Protection and Natural Resources	Yes	As support information that should be considered by preparation normative documents	Respective Division of the Ministry
State Forest Resources Agency of Ukraine	Yes	As support information that should be considered by preparation draft normative documents for the sector development and/or by analyzing current state of forest sector and respective planning	Leadership of the Agency and responsible units
Local authorities	Yes	As support information that should be considered by preparation related decisions of regional scope	Leadership and respective responsible units
Other authorities	Limited		The Ministry of Economy should be the main user of the TSOSU
State and communal enterprises responsible for SFM	Yes	As support information that should be considered by preparation related decisions	Leadership and respective responsible units
Scientific/education institutions	Yes	For respective research, analyzing current state of forest sector and preparing proposals for respective planning	Individual researchers

Entity	Is the information required?	Possible target use of the information	End user
Forestry related NGO	Limited	As analytic information	Individual members
Environmental related NGO	Limited	As analytic information for preparing respective revisions	Individual members
Wood processing related NGO	Yes	As analytic information necessary for preparing analytics for their members	Wood processing related NGO
Enterprises, members of wood processing related NGO	Yes	As analytic information necessary for preparing decision about creating/developing wood processing business	Enterprises, members of wood processing related NGO
Other related NGO	Yes	As analytic information necessary for their respective activities	Especially relevant for FSC and PEFC

3.Existing legislation and normative documents that have or could have influence on TSOSU

1. *Forest Code*. The Forest Code defines the forest ownership and the right to use of forests, principles of state regulation, tasks of different state authorities, as well as the principles of restoration, increasing productivity, protection of forests.
2. *Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on Simplifying Investment Attraction and Introducing New Financial Instruments" dated 19.06.2020 No. 738-IX* has amended the Laws of Ukraine "On Capital Markets and Organized Commodity Markets" and "On Commodity Exchanges" that came into force on 1 July 2021. The Law of Ukraine "On Commodity Exchanges" classifies timber as a commodity and an asset admitted to commodity exchange trading. Now forestry enterprises sold timber on commodity exchanges licensed by the National Securities and Stock Market Commission.
3. *Law of Ukraine "On special features of state regulation of business entities' activities related to sale and export of timber" dated 08.09.2005 No.2860-IV* that has limited consumption of timber at a level not more than 25 mio m³.

4. *Governmental Order dated 04.12.2019 No. 1142 "On Approval of the Procedure for Monitoring the Domestic Consumption of Unprocessed Timber and Control over the Non-Exceedance of the Volume of Domestic Consumption of Unprocessed Timber"*. According to an Order electronic timber tracking system is obligatory for all forest owners and forest users.
5. *Governmental Order dated 12.05.2023 N483 on the implementation of an experimental project on the issuance of a felling permit (logging ticket) and a certificate of origin of timber in electronic form*. From 16.11.2023 all above mentioned documents are issued only in electronic form for all forest users. There is reported problems with obtaining certificate of origin of timber in electronic form⁷
6. *Draft law on timber market* which aimed to regulate the functioning of the timber market, including the export of raw timber. There is no agreement between key players on the content of the draft law at the moment.
7. *Presidential Order 228/202110* was issued in order to substantially increase forest cover in Ukraine. It is foreseen to plant 3 billion trees within 3 years and 1 more million hectares within the next 10 years. The "Green Country" presidential campaign was developed based on the Presidential Order (see more information at zelenakraina.gov.ua).
8. *Latest changes in normative documents*, regulating timber harvesting (Governmental Order dated 04.02.2023 N105), forest restoration (Governmental Order dated 20.12.2022 N1410), forest management planning (Governmental Order dated 06.02.2023 N112), forest and biodiversity protection (Governmental Order dated 12.05.2023 N499).
9. *Order of the Ministry of Environmental Protection and Natural Resources of Ukraine dated 05.10.2022 N 414* on the approval of the methodology to determine damages and losses caused to the forest because of the armed aggression of the Russian Federation. Experts will assess the damage caused to forest land plots, forest stands, protected forest stands, forest nurseries and hunting grounds. It will also consider the losses from damaged harvested forest products, the unearned income of forest users, the loss of hunting grounds, the destruction of or damage to biotechnical facilities, hunting animals, the destruction of or damage to nests, burrows, and other animal habitats.

⁷ <https://www.openforest.org.ua/274500/>

4. Evaluation of Ukrainian scientific capacities for timber supply modeling

According to consultant opinion there is low capacity of scientific institutions to conduct proper timber supply modeling.

State Forest Resources Agency of Ukraine thematic research plan for 2020-2024 foresees investigation of the regional structure of forest use and forecast timber production/consumption in Ukraine until 2030 and beyond. Work conducted until 2024 includes following analyses of:

- dimensional, qualitative and cost assessment of wood production/consumption in Ukraine.
- regional features of the structure of timber production/consumption in Ukraine taking into account the natural and economic features of the territories.
- methodology for forecasting timber production/consumption.

State Forest Resources Agency of Ukraine thematic research plan for 2015-2019 included necessity to elaborate scientific and practical recommendations for assessing the efficiency of forest resources use based on a comprehensive assessment of their potential by regions.

However it should be mentioned follows:

- the assessment is superficial and does not take into account the real volumes of processed wood and its quality characteristics, as it is based solely on available statistical data that are incomplete and do not take into account all the specifics of wood production and consumption.
- the disconnect between science and SFM related issues in Ukraine does not allow a thorough analysis of the current situation and makes it impossible to provide structured and effective proposals for improving the situation.
- the ongoing war, lack of proper connection between science and forest managers and absence of proper attention to quality of scientific research make it doubtful that Ukrainian scientists will be able to define and use appropriate model parameters.

5. Conclusions on appropriate modeling methodology to be applied for TSOSU, particularly on the description of policy scenarios and useful steering parameters

Timber Supply Outlook Study for Ukraine for a certain period should be based on analysis and prognosis of forestry development and possible development of wood processing in Ukraine as two main components of the study.

Usually researchers use several scenarios – business-as-usual and scenario(s) depending on different levels of sector improvements. For TSOSU there should be several methodological decisions on the number of scenarios and model parameters. Concerning Ukraine it should be taken into account the fact of the ongoing war and related problems which means absence of standard “business-as-usual” model.

The easiest from a consultant point of view is to conduct modeling for each concrete model parameter providing assumptions of different “what-if” cases. Possible parameters of the model and assumptions for “what-if” cases are provided in table 2 below.

It should be taken into account that assumptions below are the proposal of the expert and should be further discussed and corrected.

Table 2. Possible parameters for TSOSU modeling

Parameter	Explanations	Possible assumptions for “what-if” cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
Timeframe	A decision should be made about the period of prognosis. It could be 30 or 50 years. In case of Ukraine it could be advisable to have option of 10 and 20 years					
<i>War related consequences for forest sector, including⁸</i>						
UXO contamination	At the moment it is reported about 690 thou ha of contaminated lands. This area might be bigger keeping in mind on-going war and significant amount of occupied territories. Other aspect which should be considered is resources and time necessary for demining process and fact that at the moment forest is not considered as a priority sector for demining	100-500 ha/year	500-1000 ha/year	More than 1000 ha/year	It is required: - cooperation with local authorities aiming to prove necessity and importance of forest demining - strengthening international cooperation aiming covering total or partial expenses for demining	
Forest degradation	There is no proper assessment of the state of deoccupied forest, forests under the front line and forests damaged by bombing. At the moment such assessment is possible only on territories not contaminated by UXO or where technical assessment is done.	Assessment of the forest destruction/degradation is not done	Assessment of the forest destruction/degradation is done by satellite images. Damages might be	Assessment of the forest destruction/degradation is done by satellite images and in-site surveys. It is prepared list of	It is required: - to apply methodology for proper assessment of state of damaged forests - to adopt changes into legislation permitting simplification in receiving permits for	

⁸ There taken into account only consequences that appeared directly due to the war. Beside of this it should be understood that the war hat indirect impact on all SFM indicators, which will be described below

Parameter	Explanations	Possible assumptions for “what-if” cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
			considered by SFM practice	measures aimed to minimize consequences	necessary SFM response to damages.	
Ruinations and absence of equipment necessary	There are significant ruins of forest related buildings and facilities as well as forest related equipment. A lot of cars and vehicles were mobilized	Restoration of forest related infrastructure will be conducted by SFE means – requires 30-40 years	Some international support for restoration needs will be possible – requires 20 years	There will be possible international support for restoration and new technologies will be introduced – requires 10 years	It is required: - cooperation with national state authorities aiming to receive possible support from national and international funds - strengthening international cooperation	
<i>Forest sector related data</i>						
Forest area	Unfortunately for this very important indicator Ukraine has too many uncertainties. Even considering base line scenario it should be understood that even if the total area designated to SFM will be remained the same as before the war a factual forested area might be less than before the war. For modeling reason it should be also taken into account that: - there is Presidential Order 228/2021 demanding increase of forest area but practical implementation of this Order is complicated due to practical absence of	In the end point + 500 thou ha of forest lands	In the end point + 800 thou ha of forest lands	In the end point + 1 mio ha of forest lands	It is required: - support for the process of naturally afforested lands identification - better communication and cooperation with local authorities aiming strengthening afforestation work on the abandoned suitable lands	

Parameter	Explanations	Possible assumptions for "what-if" cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
	<p>suitable land and lack of financing necessary.</p> <p>- before the war there was conducted identification of the forested area in Ukraine on the base of satellite images and there are still ongoing process of practical confirmation of their availability and legal changing their primary status to forest land</p>					
Age structure	<p>Age structure of Ukrainian forests is uneven keeping in mind that most of the forests were restored after the second world war. Now average age of Ukrainian forests is 65 year and soon forestry will face significant increase of mature stands for certain period followed by rapid significant decrease of mature stands and raw material for wood processing</p>	<p>There is no action taken to optimize age structure. As a result there will be short term rapid increase in raw material and that rapid long-term decrease</p>	<p>There is taken partial measures to optimize age structure including introducing close to nature management</p>	<p>It is conducted proper assessment and approved list of measures necessary to optimizing age structure</p>	<p>It is required improving forest management planning procedure aiming to optimizing age structure including recommendations on introducing close to nature management</p>	<p>It is required to take legislative decisions on final fellings age after proper regional assessment of the consequences of such decision with creating incentives for restoration work and introducing close to nature management</p>
Final felling age	<p>Age of final felling for each species was established at least 40 years ago and not amended afterwards. It means that the</p>	<p>No changes introduced</p>	<p>Some changes are introduced</p>	<p>It is taken decisions on final felling age for</p>	<p>It was conducted several researches on optimal age for final felling but there is missing</p>	

Parameter	Explanations	Possible assumptions for "what-if" cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
	age of final felling does not accommodate actual and possible consequences of climate change. It should be understood that this indicator has also direct influence on age structure of forests as well as amount of timber harvesting and in this regards on timber supply and further development of wood processing enterprises			all forest species after proper regional assessment of the consequences of such decision	assessment of the consequences of such a decision. As well defined ages of final felling should be approved and officially entered into force	
Species composition	It is an important indicator which has a significant influence on timber supply and further development of the wood processing industry. There is established practice to use prescribed species composition for certain forest types which are not considered effects and consequences of climate change. That's mean that without science based changes Ukrainian forestry could face situation of dying restored forest and/or lack of certain wood for wood processing enterprises and their bankruptcy	Continuation of established practice of forest restoration and according to a shifting natural conditions lack of certain wood for wood processing enterprises	There are point changes in species composition during the forest restoration, wood processing enterprises are able to buy wood throughout the country	There is elaborated and approved changes in species composition during the forest restoration as well as wood processing enterprises are prepared and have capacity for changing environment	It is required improving forest management planning procedure aiming to better accommodate species composition to climate change	It is required to take legislative decisions concerning changes in species composition during the forest restoration as well as it is conducted proper communication with wood processing industry explain possible options and consequences of

Parameter	Explanations	Possible assumptions for "what-if" cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
						climate change
Types of fellings	There is a tendency of increasing amount of selective fellings instead of clear cuts as well as conducting close to nature management	At least 20% of selective fellings in suitable growing conditions in a total amount of fellings	At least 30% of selective fellings in suitable growing conditions in a total amount of fellings	At least 50% of selective fellings in suitable growing conditions in a total amount of fellings	It is required: - better promoting selective types of fellings and close to nature forestry - improving forest management planning procedure - creating incentives for equipment and technologies necessary	
Forest regeneration	This indicator is connected with types of fellings. It should be taken into account that the bigger is percent of selective cuttings and area of close to nature forests than the bigger will be area of nature restoration and less of area of planted forests	Percent of naturally regenerated forests increased on 10%	Percent of naturally regenerated forests increased at least on 20%	Percent of naturally regenerated forests increased at least on 30%	Implementation is dependent on achievements of above mentioned indicator.	
Naturally afforested territories	This indicator is connected with the area of forest. Additionally there should be taken into account current status and further perspectives of such territories	At least 40% of all areas are identified and at least 30% transferred to SFM purpose	At least 70% of all areas are identified and at least 50% transferred to SFM purpose	All areas are identified and transferred to SFM purpose	Implementation of this indicator is dependent on capacity and willingness of local authorities to cooperate	
Natural disturbances	This indicator is connected with consequences of climate change. Its impact depends on possibility and capacity of	No changes is conducted	There is introduced changes	There is improved system of prevention	It is required preparation and implementation of the plan of improving prevention of forest	

Parameter	Explanations	Possible assumptions for “what-if” cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
	forestry to prevent and/or minimize consequences of natural disturbances (forest fires, outbreaks of pest and diseases, windbreaks etc)		and improved at least system of prevention of forest fires. Volume of damaged wood decreased in average by 30%	forest fires and other natural disturbances. Volume of damaged wood decreased in average by 50%	fires as well as contingency plans for prevention of each agent as well as building of constructions in forests aiming to prevent consequences of natural disturbances at a maximal level	
Illegal logging and related trade	Illegal logging itself has insignificant influence on timber supply but further use of “gray” or “black” timber will influence the possibility to enter certain market (e.g. EU market). Besides better use of modern technologies (e.g. LIDAR) and further introducing digital means in SFM will lead to preventing or significantly decreasing illegal logging and illegal activities in the forest sector.	No changes in to current SFM practice is introduced	There is introduced some modern technologies and there are some improvements of law enforcement system for wood processing enterprises. As a result up to 5% of wood flow is returned to	There are introduced modern technologies and improved law enforcement systems for wood processing enterprises. As a result up to 10% of wood flow is returned to legal timber supply chain	It is required improvements in law enforcement system for wood processing enterprises as well as introducing incentives for using modern technologies and/or strengthening international cooperation aiming to find proper financing	

Parameter	Explanations	Possible assumptions for “what-if” cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
			legal timber supply chain			
Forest roads	At the moment the network of forest roads is unsatisfactory in Ukraine. In case of improving forest road system will simplify access to forest resources	At least 500 km of built new forest roads per year	At least 1000 km of built new forest roads per year	At least 2000 km of built new forest roads per year	It is required additional incentives for building forest road	
Bioenergy demand	Due to the war there is increased demand for fire wood and this tendency might be maintained also in the nearest future. Besides firewood, forestry has some unused resources of so called wood residues (around 3,5 mio m3). However for their use required investments in a new equipment and technologies	No changes introduced	A new equipment/ technologies used and at least half of existing additional resource is used	A new equipment/ technologies used and existing additional resource is used	It is required additional incentives for using bioenergy, improvement of state-private partnership as well as strengthening international cooperation aiming to find proper financing	
<i>General parameters and issues related to wood processing</i>						
Economic situation in the country	At the moment there are several indicators which have significant influence on forest sector development, inter alia unstable exchange rate, price for energy, lack of personal, inflation etc. Unfortunately it is difficult to make assumptions in this situation and include all possible sub-	Inflation on a level of 10-15%	Inflation on a level of 5-10%	Inflation on a level less than 5%	It is not possible to evaluate	

⁹ Level of inflation in 2023 was 13% - [https://www.reuters.com/markets/europe/ukraines-2023-annual-inflation-slows-129-statistics-service-2024-01-10/#:~:text=KYIV%2C%20Jan%2010%20\(Reuters\),it%20said%20in%20a%20statement.&text=Our%20Standards%3A%20The%20Thomson%20Reuters%20Trust%20Principles.](https://www.reuters.com/markets/europe/ukraines-2023-annual-inflation-slows-129-statistics-service-2024-01-10/#:~:text=KYIV%2C%20Jan%2010%20(Reuters),it%20said%20in%20a%20statement.&text=Our%20Standards%3A%20The%20Thomson%20Reuters%20Trust%20Principles.)

Parameter	Explanations	Possible assumptions for "what-if" cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
	indicators in the model. The most suitable assumption could be on level of inflation					
Consequences of climate change	It is complex of indicators that have direct influence on timber supply and are partially considered above	No changes introduced	There partial changes introduced	There are introduces complex changes in SFM practice based on comprehensive research	It is required introducing complex changes in SFM practice based on comprehensive research	
Further development of circular economy	Comparing to other European countries concept of circular economy itself and importance of forest sector in this regards is not almost understood and implemented	No changes introduced	Share of forest sector in GDP is increased on 0,5%	Share of forest sector in GDP is increased on 1%	It is required awareness raising of crucial role of forest sector in circular economy as well as introducing legal changes and incentives necessary	
Development of internal timber market	Established system of timber trade in the country might have influence on timber supply and possible functioning of wood processing enterprises. There are also should be taken into account that according to a law of Ukraine "On special features of state regulation of business entities' activities related to sale and export of timber ¹⁰ " consumption of timber should be not more than 25 mio m3.	It adopted and entered into force the law on timber trade and all prescribed instruments	It adopted and entered into force the law on timber trade and all prescribed instruments. Besides it is increased limit on internal timber	Beside of two other models there is elaborated and implemented strategy aiming development of wood processing industry in Ukraine	Respective legal changes are required	Besides of legal changes it is required strengthening capacity of relevant state authority (Ministry of Economy) in regulating forest

¹⁰ <https://zakon.rada.gov.ua/laws/show/2860-15#n34>

Parameter	Explanations	Possible assumptions for “what-if” cases			Decisions/support necessary for	
		Pessimistic scenario	Realistic scenario	Optimistic scenario	Realistic scenario	Optimistic scenario
			consumption – up to 35 mio m3			industry in Ukraine
Development of external timber market	Below described two existing outlook studies describing possible scenarios of timber market developments. Before including this indicator it should be taken political decision on the most desirable direction of the timber trade – export of products or development of internal market	Ukrainian forest sector lost 50% of their niche for	Ukrainian forest sector still limited with their export operations due to internal and external limitation	There is no limitation for timber export. For example - there is continued ban on Russian and Byelorussian timber and development of timber market in China	Legislative changes are required but implementation of this indicator also dependent from external factors of global/European timber market development	
Financial incentives for forest sector	Existence or absence of financial incentives for forest sector will definitely result in quality of achievements of above mentioned indicators	No changes introduced	Some incentives are introduced	Most of incentives are introduced	Legislative changes are required as well as internal management decisions might be taken	

Possible political scenarios for forest sector in Ukraine that should be taken into account for preparation of the TSOSU

EU regulations and requirements. Ukraine is in a way to EU membership and should satisfy all existing EU forest related regulations and requirements. As of 01.01.2024 the following items should be considered and implemented fully¹¹:

- Forest reproductive material. Council Directive 1999/105/EC of 22 December 1999 on the marketing of forest reproductive material would need to be transposed into national legislation. Now a national draft law on forest reproductive resources has been drawn up and is being considered by the Ukrainian Parliament.
- Forest law enforcement and governance in the scope of implementation of Article 294 of the EU-Ukraine Association Agreement and implementation of the Regulation EU/995/2010¹¹⁶ laying down the obligations of operators placing timber and timber products on the market. It is currently adopted a new Regulation 2023/1115 of the European Parliament and the Council on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010. Comparing the new Regulation to the Regulation EU/995/2010, the following items can be highlighted:
 - Scope of the Regulation is not only timber, but also other commodities that can be obtained as a result of deforestation and forest degradation, including also cattle and soy that can be relevant for Ukraine.
 - Besides imported and domestically produced commodities, it also applies to exported commodities.
 - Operators and large traders must not only exercise due diligence but also to enter the required information into the relevant Information System.
 - There is a difference in the procedure for large and small operators and traders to run due diligence and traceability exercises, and to use the Information System in this regard.
 - Geolocation of production sites is required, among other documents that must be submitted. In addition, it is necessary to prove that neither deforestation nor forest degradation occur after timber harvesting.

All requirements of the above-mentioned new regulation will be entered into force on 30 December 2024 (30 June 2025 for micro and small enterprises). Regulation (EU) No 995/2010 is repealed with effect from 30 December 2024. However, Regulation

¹¹ https://foresteurope.org/rapid-response-mechanism/#ukraine_forests

(EU) No 995/2010 shall continue to apply until 31 December 2027 to timber and timber products that were produced before 29 June 2023 and placed on the market from 30 December 2024.

- Nature protection and climate neutrality including Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds; Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora; LULUCF Regulation. Implementation of the above-mentioned legislative acts is the responsibility of the Ministry of Environmental Protection and Natural Resources and might have further consequences for forestry.

At the moment existing EU forest related requirements do not have significant influence on forest related practice; however there is several draft regulation under development - EU Guidelines on Biodiversity-Friendly Afforestation, Reforestation and Tree Planting¹², updating regulation of forest reproductive materials¹³, monitoring framework for resilient European forests¹⁴, Directive on Soil Monitoring and Resilience¹⁵, proposal on nature restoration¹⁶, establishing a Union certification framework for carbon removal¹⁷ which requires substantial attention and could have a noteworthy impact on SFM practice in Ukraine, especially on species composition.

- Timber trade and export ban. In this block of issues are a lot of uncertainties which have significant influence for forest sector development. Draft law on timber trade passed the first reading in the Parliament but still has not been adopted due to different positions on forest sector development. It is expected that after adoption of the law regulating timber trade in Ukraine export ban will be lifted. Keeping in mind that for 3 years there are no certainties and proper decision modeling should consider several options for future development of the situation.
- Digitalization. There is significant progress in the issue of digitalization in the forest sector. From one point of view that leads to simplifying processes, from another point of view in most cases digitizing forest operations in a full amount possible will lead to prevention or significantly decreasing illegal logging and illegal activities in the forest sector. This block of issues relate using the modern technologies for forest monitoring and inventory of forest resources, for example LIDAR.

¹² https://environment.ec.europa.eu/publications/guidelines-biodiversity-friendly-afforestation-reforestation-and-tree-planting_en

¹³ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023PC0415&qid=1704544082641>

¹⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023PC0728&qid=1704544445659>

¹⁵ https://environment.ec.europa.eu/publications/proposal-directive-soil-monitoring-and-resilience_en

¹⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0304>

¹⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022AE6159&qid=1704544964721>

- Non wood forest products. At the moment more than 90% of forestry related income in Ukraine comes from the timber sale. Only several forest enterprises/branches took proper attention to income possibilities provided by using non-wood forest products and/or recreational, touristic and educational facilities. Normative documents supporting SFM underlining the importance of this issue, so in the nearest future the focus of forest enterprises might be changed.
- Climate change. Unfortunately despite the existing consequences of climate change in forestry there is no proper strategy of forest adaptation to climate change and changing respectively traditional SFM practice. Existing international recommendations and related recommendations of national researchers is not taken into account.
- Biodiversity conservation – Implications of the Global Framework for Biodiversity and EU Biodiversity Strategy for 2030. Answer on political question how much forest should be conserved and how the country will implement requirements of above mentioned arrangement requiring 30% of territory as conserved area. Proper and detailed answers will significantly influence sector development with understanding that ecological limitations to SFM will lead to decreasing amount of timber harvesting and bankruptcy of wood processing enterprises.
- Circular economy. Unfortunately nevertheless the existing trend in Europe in Ukraine is low understanding of the role of the forest sector in the circular economy.

Description of existing outlook studies and models

At the moment there are two comprehensive forest sector outlook studies:

- Global forest sector outlook 2050¹⁸, prepared by FAO assessing future demand and sources of timber for a sustainable economy. The baseline outlook data for primary processed wood products in this study derives from the Global Forest Products Model (GFPM) where projections depend on the historical patterns of wood products production and trade, provided by the Food and Agriculture Organization of the United Nations (FAO) and their interaction with exogenous factors such as gross domestic product (GDP), population, trade policies or forest area change (Nepal et al., 2021b).
- The latest Forest Sector Outlook Study 2020-2040 (FSOS)¹⁹ for the UNECE region prepared by UNECE/FAO Forestry and Timber Section provides information that supports decision-making by showing the possible medium and long-term

¹⁸ <https://www.fao.org/documents/card/en?details=cc2265en>

¹⁹ https://unece.org/sites/default/files/2022-05/unece-fao-sp-51-main-report-forest-sector-outlook_0.pdf

consequences of specific policy choices and structural changes, using scenario analyses whenever possible. The study takes a pragmatic, transparent and objective approach to answering these key questions, sometimes using a modeling approach. For modeling also used the Global Forest Products Model (GFPM). It enables stakeholders to evaluate the long-term consequences of policy choices on wood demand, wood supply, timber trade, climate change impacts, adaptation and mitigation. The results are reported for five subregions: North America; Europe-EU; Europe-Other; the Russian Federation; and Eastern Europe, Caucasus and Central Asia (EECCA).

A short term analysis of timber market trends is provided on an annual basis by UNECE/FAO Forestry and Timber Section based on countries market statements. Result of the analysis and market statements are published on the Section webpage²⁰.

Beside of this there are several other interesting research models for modeling forest sector development:

- *the European Forest Information SCENario Model (EFISCEN)*, prepared by European forest institute²¹. It is a large-scale forest model that projects forest resource development on a regional to European scale. The model is suitable for the projection of forest resource development for a period of 50 to 60 years.

EFISCEN provides data on basic forest inventory data (species, area, growing stock, increment, mortality, age-structure), but the model includes multiple indicators related to important forest ecosystem services (carbon sequestration, biodiversity, recreation, wind and fire risk), enabling the assessment of impacts of different policy and management strategies at the national and European level.

In 2000, the EFISCEN model was used for scenario modelling by researchers in Ukraine. The results of the scenario analysis have been published in national and international scientific journals (<https://efi.int/knowledge/models/efiscen/publications>).

- *the Global Forest Sector Model EFI-GTM*²², prepared by European Forest Institute is a regionalized partial equilibrium model of the global forest sector with a special emphasis on Europe. This model was used to address:

- Forest conservation policies and increased forest growth due to climate change

²⁰ <https://unece.org/forests/annual-market-reviews-and-data-briefs>

²¹ <https://efi.int/knowledge/models/efiscen/publications>

²² https://efi.int/sites/default/files/files/publication-bank/2018/ir_15.pdf

- Increased investments in forest plantations in Asia and South America
- Impact of EU FLEGT on the trade of wood and wood based products
- Impact of the Russian roundwood export tariffs
- Increased demand for bioenergy and impact of the various carbon emission and fossil fuel prices on the use of wood biomass for energy
- Impact of subsidies on the use of the wood biomass for energy.

The model maximizes this surplus restricted by resources, capacity and budget constraints, as well as by possible barriers of trade.

- *the Tool for Sustainability Impact Assessment (ToSIA)*²³, also prepared by European Forest Institute is a decision-support software tool on issues related to the use of forest resources and the production and consumption of wood products. ToSIA analyzes Forest Wood Chains as chains of production processes which are linked by products. Each process is characterized using indicators of environmental, social, and economic sustainability. The tool quantifies sustainability impacts of decision alternatives in policies, management or technology in a transparent way to offer an objective platform for communication and argumentation about sustainable development in the forest based sector. The tool is available to members of the ToSIA Management and User Group.
- *the European Forestry Dynamics Model (EFDM)*²⁴, which is a joint effort between the European Commission Joint Research Centre and partners in the EU Member States for the development of a forestry dynamics model. The model is expected to project the state of Europe's forests given different climatic, economic and management scenarios. EFDM was designed as a flexible system to facilitate the different types of data input that are available from the diverse National Forest Inventories. The model captures different typologies such as site productivity, ownership and the probability of natural disturbances. Specifically, EFDM is able to process detailed national-level input data such as National Forest Inventories (NFI) outputs, as well as related national-level expertise in social and economic domains.
- GAYA²⁵, elaborated by Swedish Forest Institute, is a dedicated tool for computing management programs for inclusion in LP problems. GAYA is

²³ <http://tosia.efi.int/tmug.html>

²⁴ <https://op.europa.eu/en/publication-detail/-/publication/4715d130-0803-4e99-abad-915fec152c7b/language-en>

²⁵ <https://www.diva-portal.org/smash/get/diva2:1682240/FULLTEXT01.pdf>

designed to yield a large set of management programs to feed into an analysis tool, normally a linear programming solver.

- *The Global Forest Trade Model*²⁶ (GFTM), is being developed at the Forest Resources and Climate unit of the Institute for Environment and Sustainability (IES). The GFTM is an equilibrium trade-based model for the forest sector with the aim of providing projections of production and trade of wood-based products and pellets for 48 countries/sub-regions of the world, with a focus on EU. GFTM is a stand-alone model, but it is designed to be integrated with the Wood Resource Balance (WRB) (Mantau et al. 2010²⁷), the forest owner decision model Expected Value Asymmetries (EVA) (Rinaldi et al. 2015²⁸), and EFDm.

6. Existing information for the modeling

It is worth mentioning that proper modeling is dependent on proper information. At the moment the State Statistic Service of Ukraine is responsible for forest sector related data. The State Forest Resources Agency of Ukraine is accumulating forest related data for the forests under their supervision. Statistical data of State Forest Resources Agency of Ukraine is more detailed than data of State Statistic Service of Ukraine but as soon as draft law concerning conversion of SE “Forests of Ukraine” into a joint-stock company with 100 percent of its shares belonging to the state will be considered and adopted by the Parliament State Statistic Service of Ukraine will be the only source for forest sector related data.

Information about forest sector that might be used for TSOSU publicly available at State Statistic Service of Ukraine²⁹:

- Area and amount of timber harvesting by types of fellings, species compositions and timber assortments
- Amount of round timber sold
- Area of destroyed by fires, pests and diseases
- Area of forest restoration
- Harvesting of non-wood forest products

²⁶ https://www.researchgate.net/publication/280609340_The_Global_Forest_Trade_Model_-_GFTM

²⁷ Mantau, U. 2010: Method of the Wood Resource Balance. pp 14-29. in: EUwood - Methodology report. Hamburg/Germany, June 2010. 165 p.

²⁸ Rinaldi, F., Jonsson, R., Sallnäs, O., Trubins, R. 2015. Behavioral Modelling in a Decision Support System. *Forests*, 6: 311-327

²⁹ <https://ukrstat.gov.ua/>

- Volume of products produced and sold by types of processed wood by region (2014-2021). These data were provided only in national currency without the possibility to make assessment of real volume of production.
- Number of employees in timber industry by types of processed wood by region (2014-2021)
- Number of enterprises in timber industry by types of processed wood by region (2014-2021)

7. Justification of required international support during the elaboration of TSOSU, particularly by SFI-Project

Necessity and importance of timber supply outlook for forest sector development was discussed before the war. In the condition of the on-going war and lack of national capacity of proper conduction the modeling, an opportunity that Ukraine will sustainable develop the forest sector as a whole is negligible.

It is also should be taken into account that forestry and forest related issues are not considered as the priority areas at Governmental level which resulted in absence of political understanding of complexity of the sector and casual links. Superficial simplicity of process of forest growing makes a wrong impression of simplicity of sector as such.

In the same time there should be taken into account following current aspects of sector development:

- In absence of analysis and prognosis of possible timber supply there are numerous problems with access to raw material for wood processing enterprises as soon as there is a lack of analyzing the possibility of timber supply before the enterprise is established.
- Ukrainian forestry does not pay proper attention to transport logistics which has resulted in enormous transport costs.
- There is still a pending issue of regulating timber trade and it is required improvements in digitalization and transparency of forest related operation.
- There are many improvements in forestry against illegal loggings but still a lot of "gaps" in wood processing chain permits to use and process at least "gray" raw material. Lack of proper knowledge and poor statistics prevent reliable law enforcement in this field.
- On-going war and war consequences already today make it more difficult to expect.

- Ukrainian experts have no experience in conducting outlook studies of this complexity and never participated in modeling in European level. Such cooperation is difficult among other reasons due to language barriers.

It is important that further international support in possible conducting timber outlook study include among other work on improving forest related statistics, capacity building work at different level as well as proper discussion and distribution of the outlook study result.