

Annex 25

Estimation of Beneficiaries and Assumptions

For the GCF-FAO Project “Enhancing the resilience of Serbian forests to ensure energy security of the most vulnerable while contributing to their livelihoods and carbon sequestration (FOREST Invest)”

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Table 1: Summary of Beneficiaries

	Direct	Indirect	Total
Total Beneficiaries of the Project	729,064	2,846,380	3,575,444

Table 2: National Level Population, 2022

Data	Value	Rural	Urban
Total Population	6,664,449.00	2,534,763.00	4,129,686.00
Share of total population (%)	100%	38%	62%
Share of Female (%)	51%	50%	52%
Avg. HH Size	2.55	2.75	2.44
Total Number of Households (HH)	2,614,226.26	921,732.00	1,692,494.26
Percent of HH heating via fuelwood (FW)	47%*	77%*	29%*
Number of Individuals heating via FW	3,126,193.26	1,949,232.75	1,176,960.51
People Living under USD 2.15/day	0.2%	5,069.53	8,259.37
People at risk of poverty	25%	633,690.75	1,032,421.50

Source: Statistical Office of the Republic of Serbia and "Census of Population, Households and Dwellings, 2022".

* Statistical Office of the Republic of Serbia and "Energy consumption in Households in Serbia, 2021".

Table 3: Output-Wise Estimation of Beneficiaries

Components/outputs	Direct	Indirect	Total
OUTCOME 1: National-level upscaling of sustainable and climate adaptive silviculture and carbon finance framework			
<i>Number of beneficiaries</i>	212,920	346,894	559,814
Output 1.1: Forest management and monitoring policy framework for climate adaptive silviculture enhanced and disseminated			
Number of beneficiaries	212,920 ^a	346,894 ^b	559,814
Output 1.2: Enabling framework for national institutions to engage with carbon finance for AFOLU created			
Number of beneficiaries	0	0	0
OUTCOME 2: Improved energy security and livelihood from climate resilient forest ecosystem and as well as GHG emission reductions from increased carbon sinks and decarbonization opportunities			
<i>Number of beneficiaries</i>	212,920	2,152,592	2,365,512
Output 2.1 Production of climate-adaptive seedlings enhanced			
Number of beneficiaries	0	794,548 ^c	794,548
Output 2.2: Knowledge on climate adaptive silviculture (CAS) of key stakeholders enhanced			
Number of beneficiaries	0	1,011,151 ^d	1,011,151
Output 2.3: Public and private forest land restored and afforested in a climate adaptive and participatory manner			
Number of beneficiaries	212,920 ^e	346,894 ^f	559,814
OUTCOME 3: Private sector is engaged in climate adaptive silviculture and decarbonization investments			
<i>Number of beneficiaries</i>	303,224	346,894	650,118
Output 3.1: Private sector contribution to climate resilience of forests enhanced through climate adaptive and diversified investments and greening of the biomass value chain initiatives			
Number of beneficiaries	303,224 ^g	346,894 ^h	650,118
Output 3.2: Mobilized private finance for agribusinesses involved in decarbonization processes.			
Number of beneficiaries	0	0	0

Output 3.3: Financial institutions, consultancy service providers, and academia capacitated on climate-related challenges and opportunities			
Number of beneficiaries	0	0	0
Total Beneficiaries of the Project	729,064	2,846,380	3,575,444

Assumptions

a: Considering that each component will directly benefit poor and at-risk individuals, the calculation includes a third of the following segments of the population in Table 2 above: rural people living under USD 2.15 and rural People at risk of poverty. The other two-thirds of these segments are accounted for in C2 and C3.

Adaptation benefits: See Table 4 under **(II)** Wood biomass fuel consumers

b: Enhancing the biomass value chain will impact the vulnerable rural population and, as a spillover effect, the vulnerable urban population utilizing fuelwood for heating purposes. The project, therefore, accounts for the urban poor and at-risk-of-poverty individuals as indirect beneficiaries. Under b, the calculation includes a third of the following segments of the population, as shown in Table 2 above: urban people living under USD 2.15 and urban people at risk of poverty. The other two-thirds of these segments are accounted for in C2 and C3.

Adaptation benefits: See Table 4 under **(II)** Wood biomass fuel consumers

c: The total number of indirect beneficiaries represents the total number of municipalities involved (174) and the total number of forest owners (882,482 individuals). The number of those already accounted as direct beneficiaries in output 3.1 (88,054) is discounted.

Size of Private forests	# of Owners	%
01-1 ha	638,322	72.3%
1-10 ha	233,846	26.5%
10-20 ha	8,372	0.9%
20-30 ha	1,516	0.2%
> 30 ha	426	0.0%
Total	882,482	100%

Adaptation benefits: See Table 4 under **(I)** Owners of Forests and **(V)** Municipalities

d: Total rural population discounted of the value reported as direct beneficiaries in outputs 1.1, 2.3, and 3.1 and indirect beneficiaries in 2.1.

Adaptation benefits: See Table 4 under **(II)** Wood biomass fuel consumers. The beneficiaries also benefit from enhanced forest ecosystem services such as improved water regulation, soil conservation, biodiversity, and risk reduction.

e: The calculation includes a third of the following segments of the population included in Table 2 above: Rural People living under USD 2.15 and rural People at risk of poverty

Adaptation benefits: See Table 4 under **(II)** Wood biomass fuel consumers

f: The calculation includes a third of the following segments of the population included in Table 2 above: Urban People living under USD 2.15 and urban People at risk of poverty

Adaptation benefits: See Table 4 under **(II)** Wood biomass fuel consumers

g: The number includes 2250 beneficiaries representing the works involved in the forestry investment activities with private sector. The project aims to reach at least 10% of all private forest holders (88 thousand) from those owning below 20 ha of forest (99% of the total forest owners or 880,540). Furthermore, the calculation also includes a third of the following segments of the population included in Table 2 above: Rural People living under USD 2.15 and rural People at risk of poverty

Adaptation benefits: See Table 4 under **(i)** forest owners and **(II)** Wood biomass fuel consumers

h: The calculation includes a third of the following segments of the population included in Table 2 above: Urban People living under USD 2.15 and urban People at risk of poverty

Adaptation benefits: See Table 4 under **(II)** Wood biomass fuel consumers

Table 4: Beneficiaries mapping and project involvement / benefits

Beneficiaries	Rationale	Involvement / Benefits	Summary adaptation benefits
(I) Owners of forestsⁱ.	The high rate of privately owned coppicing stands that are not managed is reducing the capacity of forests to support communities and the economy through ecosystem services. Due to the high fragmentation of private forests and the limited capacity of investment of smallholders, private forests are largely not managed, and very few are the owners that joined the forest owners' associations (~1,800 owners). This has reduced the maintenance of forests and reduced their resilience.	The project will support the aggregation of forest owners through a dedicated platform (Activity 3.1) and will involve them in all the training and investments planned by the project. This will include, via the owners' associations and the chambers of commerce, TA to manage their plots, access lands, and support in maintenance and enhancement (e.g., conversion into high forest stands) of their plots. The project aims to reach at least 10% of all private forest holders (88,054) from those owning less than 20 ha of forest (99% of the total forest owners, or 880,540) ⁱⁱ . Priority will be given to single-headed women and women owners (< 30% of total forest owners) ⁱⁱⁱ . Access to project activities will be volunteer and will be regulated by the specific selection criteria presented in every activity.	The project provides technical assistance and training to forest owners, improving their knowledge and skills related to climate-resilient forest management practices, leading to increased long-term economic stability and resilience. The aggregation of forest owners through a dedicated platform provides opportunities for forest owners to overcome fragmentation, allow economies of scale in forest climate-adaptive management, and share knowledge. The enhanced policy framework for improved management of national forest resources and the upgrades of seedling centers will furthermore provide an enabling framework and services for the whole forestry sector, including forest owners, to increase climate resilience and, hence, the value of their assets.
(II) Wood biomass fuel consumers	While the efficiency of heating appliances is improving, and a recent law requires efficiency to be at least 60% (fuel/heat), the efficiency of biomass itself (processing, storage, consumption) has yet to be addressed. Consumers are, therefore, far from using wood biomass fuels (e.g., fuelwood, briquettes, and pellets) following efficiency criteria, and up to 60% of fuelwood users do not have access to properly dried material.	To directly benefit at least 638 thousand rural people depending on fuelwood who are poor or at risk of poverty based on WB assumptions of 2022 ^{iv} , pellets and briquettes for their energy security (i.e. heating), the project will support with technical assistance and policy / standard development national institutions and biomass value chain actors in increasing the efficiency of wood biomass for fuel (e.g. fuelwood, pellets, briquets) while reducing the impacts of production, storage, and consumption. Finally, the project will reach at least 10 thousand wood biomass energy users through dedicated campaigns designed to ensure the highest behavioral change, specifically focusing on gender.	The project aims to increase the efficiency and security of wood biomass for fuel, including fuelwood, pellets, and briquettes. This will lead to more reliable and sustainable energy sources for heating, directly addressing the vulnerability of rural populations to energy insecurity. More efficient biomass fuels could reduce fuel consumption, potentially lowering costs for rural households and increasing their adaptive capacity to economic and climate-related shocks. The main indicators for an increase in energy security of biomass fuel producers that are also considered in the logical framework of the FP in chapter E.5 are (i) Reduction in the indicator of inability to keep house warm from 9.5% to 9% over the lifetime of the project; and a (ii) reduction of 6% of fuelwood consumption of HH in pilot areas.
(III) Smallholders that have halted farming their land due to soil degradation.	Decades of intensive farming compromised the quality of agricultural land, leading to 424,054 ha of unused agricultural land (5.5% of the territory) ^v . This phenomenon is particularly evident in Vojvodina (northeastern districts), where farmers have stopped farming in their fields. The project will support the private sector in planting Short Rotation Plantations for energy, allowing farmers to profit from their lands with a reduced investment need and allow soil to recover. In a BAU scenario, unfarmed lands will increasingly degrade, compromising sustainable biomass production's potential.	The project will support private smallholders who own degraded and unfarmed lands and plant trees for biomass in unfarmed/degraded lands. This will allow at least 500 small farmers to profit from their lands with a reduced investment need. It will allow the soil to recover and the market and the country to plan for biomass fuel production, reducing anthropogenic pressure from forests. Priority will be given to single-headed women and women owners (< 30% of total landowners) ^{vi} . Access to project activities will be voluntary and regulated by the specific selection criteria presented in every activity.	The beneficiaries will be provided with the following benefits: <ul style="list-style-type: none"> - Restoration of soil health and fertility, increasing the land's resilience to climate impacts - Diversified income from previously unproductive lands, providing an alternative income source and enhancing their economic resilience to climate change - Reforesting degraded lands helps mitigate erosion and improve water retention, making the land more resilient to climate-related stresses like droughts and intense rainfall - Enhanced adaptive capacity as they gain knowledge and skills in sustainable land management and agroforestry practices, improving their ability to adapt to changing climate conditions. - The beneficiaries will, above all, benefit through increased climate resilience of their land and hence improved productivity and value of their assets.

<p>(IV) Smallholders, and municipalities that want to establish windbreaks and shelterbelts to protect their crops.</p>	<p>Increasing winds, soil erosion and reduced crop field productivity negatively impact Serbia farming. In the past, due to the need for fuelwood, shelterbelts and windbreakers have been removed. In a BAU scenario, erosion caused by wind and described CCs (i.e. increasing temperatures and erratic rainfall patterns) will continue and magnify current erosion and land degradation phenomena. On the contrary, reestablishing windbreakers and shelterbelts will reduce the exposure of agriculture while contributing to decarbonization.</p>	<p>The project will support private landowners and municipalities in agricultural areas (i.e., Vojvodina) to establish windbreakers and shelterbelts, reducing the adverse impacts of increasing wind and contributing to increasing the national forest cover and enhancing key ecosystem services such as carbon removals from the forest sub-sector. Priority will be given to municipalities and to single-headed women and women owners (< 30% of total forest owners)^{vii}. Access to project activities will be voluntary and regulated by the specific selection criteria presented in every activity.</p>	<p>Windbreaks and shelterbelts protect crop production from increasing wind, increasing the climate resilience of beneficiaries. Shelterbelts help prevent wind erosion, preserve topsoil, and maintain long-term agricultural productivity in the context of more frequent extreme weather events. In addition, they can moderate local temperatures. Furthermore, investments increase national forest cover, which provides broader adaptation benefits such as improved water regulation and biodiversity conservation. The beneficiaries will, above all, benefit from the increased climate resilience of their land and, hence, improved productivity, income, and the value of their assets.</p>
<p>(V) Municipalities</p>	<p>Forest communities are not involved in forestry management, and land under towns and municipalities is often neglected and not managed. Towns and municipalities are mandated to protect themselves from natural and other disasters (Article 20 of the Local Self Government Act 12/2007) and perform other duties and services delegated by national legislation provisions in protection and firefighting, among others. Local municipal institutions also have competencies in performing delegated services within the inspection in environmental protection, agriculture, forestry, and water, among others (Article 22 of the Local Self Government Act) [IUCN, 2022].</p>	<p>The project will ensure the involvement of municipalities and their communities in identifying forest investments and supporting forest investments in over 2,200 hectares. Administrations and local society organizations will be involved in the training and knowledge transfer process. The project will involve 174 municipalities in Central Serbia and Vojvodina. Access to project activities will be voluntary and regulated by the specific selection criteria presented in every activity.</p>	<p>The project involves municipalities identifying and implementing forest investments in over 2,200 hectares, enhancing their ability to adapt to climate change impacts. The increased forest area provides various ecosystem services that benefit municipalities, such as improved water regulation, soil conservation, biodiversity, and risk reduction. Municipalities gain knowledge and experience in climate-resilient forest management practices by participating in forest investment identification and implementation. The project helps municipalities build stronger community and participatory networks for climate resilience by involving local society organizations.</p> <p>The municipalities and the people living in forests or in areas adjacent to forests will benefit from the project through enhanced climate resilience of the forests and, hence, improved ecosystem services that are measurable, e.g., through reduced erosion rates and reduced flooding events.</p>

ⁱ Private forest owners are partially grouped into 30 local associations, of which 18 are currently active [Georgieva et al., 2021].

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ⁱⁱⁱ The project will ensure informing each woman owner reported in the official online cadastre and will guarantee the conditions for all to apply to project activities. Being participation voluntary and demand driven. Given the results of a 2020 study done by FAO in the Western Balkans, Serbia disposes of high levels of guarantees of gender equality in land ownership and/or control in the legal framework [FAO, 2020]. In the region the average land ownership of women is below 30%.

iv

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^v Radojević et al, 2015

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