

ANNEX 2A. LOGICAL FRAMEWORK FOR THE PROJECT “FOREST RESILIENCE OF ARMENIA, ENHANCING ADAPTATION AND RURAL GREEN GROWTH VIA MITIGATION”

	Description	Indicators	Baseline	Targets (mid-term)	Targets (final)	Sources and means of verification	Assumptions
Fund-level impact	M3.0 Reduced emissions from buildings, cities, industries and appliances	M.3.1 Tonnes of carbon dioxide equivalent (t CO ₂ eq) reduced or avoided as a result of Fund-funded projects /programmes – <i>buildings, cities, industries, and appliances sub-indicator</i>	Emission from heating appliances (t CO ₂ eq) ¹ 0	Reduced Emission (t CO ₂ eq) -122,988 Y4	Reduced Emission (t CO ₂ eq) -175,697 8y	BUR submitted to UNFCCC by the MoE Reports from Independent and external household surveys	GHG estimates are based on the twenty-year (20) project lifetime, estimated with EX-ACT tool, and monitored with independent households surveys aimed at assessing fuelwood management/consumption in project areas as well as project's reports. The project will decrease the fuelwood energy needs by at least 30 % (from 8 m ³ per households to 5.6 m ³ per households). Equivalent to a reduction of wood consumption from 36,806 ¹ to 25,764 tonnes of dry matter per year considering an emission factor of 1.326 ² t CO ₂ eq/t of dry matter. Expected emission reductions over the project lifetime of 20 years -175,697 tCO ₂ eq.
	M4.0 Reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks	M.4.1 Tonnes of carbon dioxide equivalent (t CO ₂ eq) reduced or avoided (including increased removals) as a result of Fund-funded projects /programmes – <i>forests and land-use sub-indicator</i>	Carbon removals from the forest sub-sector (t CO ₂ eq): 0	Carbon removals from the forest sub-sector (t CO ₂ eq): -849,972 Y4	Carbon removals from the forest sub-sector (t CO ₂ eq): -7,919,876 Y8	BUR submitted to UNFCCC by the MoE FAO EX-ACT informed by annual reports from the MoE - FMC ³	According to the best available data, it has been estimated at project start that the total forest area of the target areas equals 135,790 ha, using the following Definition of Forest (based on forest code of Armenia in accordance with FAO FRA): Minimum land area of 0.1 ha with trees higher than 5 m and a canopy cover of more than 30 per cent. Forest Degradation can be defined as changes within the forest which negatively affect the structure or function of the stand or site, and thereby lower the capacity to supply products and/or services. Due to two decades of overexploitation of forest, mainly for fuelwood purposes, the average level of degradation at project start was estimated large (60%) according to EX-ACT classification, The change in the level of forest degradation with and without project

¹ Based on data collected via household surveys aimed at assessing fuelwood consumption for heating purposes. [Residential energy consumption survey, 2015](#)

² Energy content of wood (moisture content 25%-35%) = 3.4 kWh/kg Wood CO₂eq with an emissions factor of wood = 0.39 kg CO₂ eq/kWh wood. Möllersten, K. 2017. The Power Africa beyond the Grid Fund for Zambia: Methodology to measure, report and verify on annually avoided greenhouse gas emissions and Breisinger, M. 2012. Greenhouse Gas Assessment Emissions Methodology.

³ Data will be collected by the Forest Monitoring Center of the Ministry of Environment via repeated assessment of the situation in project areas by field inspections + aerial imagery (high resolution orthophoto maps and surface models) acquired by drones in year 1, 3, 5 and 7. Location for each of the forest investment site will be georeferenced and a complete Project Intervention Atlas will be constantly updated by the M&E Unit starting from the Baseline. The Atlas will be public and shared annually.

							<p>scenarios are described in the EX-ACT methodology. The expected emissions over the 20-year project lifetime are --18,833,290 tCO₂eq.</p> <p>Absence of major natural disasters including forest fires in the country and in target areas.</p> <p>State budget allocated to fulfill NDCs is guaranteed during and after the project.</p> <p>The economic, social and political context in the country and project areas remains stable.</p>
	<i>A4.0 Improved resilience of ecosystems and ecosystem services</i>	A 4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change	0 ha of forest	3,800 ha of forest	135,790 ha of forest	<p>BUR submitted to UNFCCC by the MoE informed by annual reports from the MoE – FMC⁴</p> <p>National Report of the Republic of Armenia to the UNCBD and to the UNCCD.</p>	<p>Analysis of the Land Productivity Dynamics (LPD) via FAO Earth Map joined with ground truthing done with external experts⁵ and communities will allow the assessment of project's impacts on ecosystems. Results will be disaggregated per level of degradation⁶ at district, community and ecosystem levels.</p> <p>Absence of major natural disasters including forest fires in the country and in target areas.</p> <p>State budget allocated to fulfill NDCs is guaranteed during and after the project.</p> <p>The economic, social and political context in the country and project areas remains stable.</p>
Fund-level Outcomes	<i>M7.0 Lower energy intensity of buildings, cities, industries and appliances</i>	M 7.1 Energy intensity / improved efficiency of buildings, cities, industries and appliances as a result of Fund support.	Improved Efficiency of heating appliances <40% Energy Intensity < 50 GWh	Improved Efficiency of heating appliances >60% Energy Intensity 67.5 GWh	Improved Efficiency of heating appliances >60% Energy Intensity > 75 GWh	Reports from external and independent technical assessments	<p>Economic social and political situation in the country and in project areas remains stable. Energy efficiency of existing wood stoves is < 40%. Introduced technologies and practices will increase the efficiency value to > 60%. Since current efficiency of wood stoves is <40%, less than 50 GWh of the total energy content of the Wood fuel (=125 GWh) can currently be transformed into heating energy. Detailed technical assessment will be performed by external and independent service providers after installation of the EE stoves, during the 4y of execution and at completion.</p>

⁴ Data will be collected by the Forest Monitoring Center of the Ministry of Environment via repeated assessment of the situation in project areas by field inspections + aerial imagery (high resolution orthophoto maps and surface models) acquired by drones in year 1, 3, 5 and 7. Location for each of the forest investment site will be georeferenced and a complete Project Intervention Atlas will be constantly updated by the M&E Unit starting from the Baseline. The Atlas will be public and shared annually.

⁵ Independent surveys.

⁶ Declining productivity, Early Signs of Decline, Stable but Stressed, Stable not Stressed, Increasing productivity.

	M9.0 Improved management of land or forest areas contributing to emissions reductions	M9.1 Hectares (ha) of land or forests under improved and effective management that contributes to CO2 emission reductions	0 ha	3,800 ha	135,790 ha	BUR submitted to UNFCCC by the MoE. Informed by annual reports from the MoE – FMC ² External and independent interim and final evaluations	Analysis of the Land Productivity Dynamics (LPD) via FAO Earth Map joined with ground truthing done with external experts ⁷ and communities will allow the assessment of project's impacts on ecosystems. Results will be disaggregated per level of degradation ⁸ at district, community and ecosystem levels.
	M5.0 Strengthened institutional and regulatory systems	5.1 Institutional and regulatory systems that improve incentives for low emission planning and development and their effective	0	1 National energy efficiency standard for heating appliances and biomass fuels approved ⁹	1 National energy efficiency standard for heating appliances and biomass fuels approved and implemented successfully.	Official publication from the Ministry of Economy (National Gazette)	Economic social and political situation in the country and in project areas remains stable. Standards will be prepared jointly with the Ministry of Economy, the Ministry of Energy and Natural Resources and the Ministry of Environment. Standards will be prepared according to the principles stated in the RA Law "On Energy Saving and Renewable Energy" (L. 122) 2004.
	A8.0 Strengthened awareness of climate threats and risk-reduction processes	A8.1 Number of males and females made aware of climate threats and related appropriate responses.	Males: 0 Females: 0	Males: 74,000 Females: 78,000	Males: 144,000 Females: 156,000	Vocational schools registers Reports from external and independent surveys with municipalities, communities and civil society Project reports ¹⁰ .	The project will involve communities in target areas (15 municipalities and 207 rural communities).

Component 1. Climate Change mitigation and adaptation through forest investments and technology transfer

⁷ Independent surveys.

⁸ Declining productivity, Early Signs of Decline, Stable but Stressed, Stable not Stressed, Increasing productivity ([Based on UNCCD definition](#)).

⁹ Government of RA's commitment to promotion of energy efficiency (EE) is reflected in the Law on Energy Saving and Renewable Energy (2004). The Law lays out the principles of the government's policy and governance structure supporting energy efficiency. While forming a fertile ground to ensure EE, the current laws and policies do not include EE standards for fuelwood fueled heating appliances that are the primary source of about 74% of the rural population. Such gap will be filled by the project as the current legal frameworks contains the elements needed to include fuelwood and other biomasses and EE standards for wood fueled appliances.

¹⁰ Project reports will also include geographical coordinates (georeferencing) of each activity including trainings and forest investments. These will be public.

Output	By Y8, at least 2.5% of degraded forestland is restored and sustainably managed following a climate adaptive methodology.	Area (ha) of forest lands restored	0 ha	3, 800 ha	7,300 ha	Annual reports from the MoE - FMC ¹¹ Reports from external and independent surveys with municipalities, communities and civil society Project Reports	Forests' losses in project areas remains within the limits (the current level of timber exploitation for fuelwood cutting) identified in the baseline via ground truthing and the analysis of time-series analysis of Landsat images characterizing forest extent and change. Absence of major natural disaster including forest fires in the Country and in project areas. ¹² State budged allocated to fulfill NDCs is guaranteed during and after the project.
		Adoption rate of climate adaptive practices in forest restoration and management	0%	At least 20%	60%		
Component 2. Promoting forest sustainability reducing forest degradation drivers							
	By Y6, fuelwood consumption per energy unit output of targeted rural communities is optimized and decreased by at least 30%.	Average Volume (m ³) of yearly required fuelwood in target households is reduced by at least 30%	8 m ³ (100%)	5.6 m ³ (-30%)	5.6 m ³ (-30%)	Reports from external and independent surveys with HH	Economic social and political situation in the country and in project areas remains stable. Rebound effect of energy consumption from fuelwood at the rural household level is limited to 20% max.
		(Female-headed) household expenses on energy (fuelwood) % change in expenditure on purchasing fuel for household energy needs by women	USD 250 (0%)	USD 175 (-30%)	USD 175 (-30%)	Reports from external and independent surveys with EE private Sector National Statistic ARMSTAT	
Component 3. Strengthening governance of Forest resources and climate change's impact management at community, as well as local and central government levels							
Output	By Y8, relevant stakeholders (including Hayantar ¹³ and local communities) are enabled to adopt effective governance and adaptive management of forests and related ecosystem services.	# of community concessional management contracts supported by the project	0	0	At least 4	Official reports from the MoE confirming the award of the contract	Decree N-583-N consent communities to obtain concession over forests (10 years) in their areas only assumed they fulfill the technical and administrative specifications.
		# of Forest Management Plans (community level)	0	2	10	Ministry of Environment official publications	Community forest management plans will be precondition to apply for concession over public

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¹² To be monitored via EarthMap using the Terra and Aqua combined MCD64A1 Version 6 Burned Area data product at 500 meters resolution.

¹³ Hayantar is under the subordination of the State Forest Committee. Main functions of Hayantar are to ensure control, protection, conservation of biodiversity, restoration, re/afforestation and efficient use of state forests and forest lands. Annex 2, Section 6 pg. 27.

		<i>adopting the sustainable and climate adaptive guidelines</i>				in the National Gazette.	forests as dictated by the Armenia Forest Code and the executory decree N-583-N of 2006.
		<i># and % of women and men (from remote rural areas) who attend/are actively involved in sectoral planning and consultation meetings</i>	0	At least 600 individuals 312 Women (52%) 288 Men (48%)	At least 600 individuals 312 Women (52%) 288 Men (48%)	Reports from external and independent surveys with municipalities, communities and civil society Project Reports	Communities and local institutions will be capacitated at least on the followings: a) Climate-adaptive management in forest restoration. b) Role and responsibilities of communities in fire prevention and post-fire management. c) Role and responsibilities of communities in monitoring forest's health and threats. d) Role and responsibilities of communities in ensuring sustainable fuelwood management as well as sound harvesting, management and handling practices.
	List the activities	Description				Inputs	
Component 1							
<i>Output 1.1. By Y2, at least 3 nurseries are operational in the production of climate adaptive seedlings and Hayantar staff capacitated</i>							
Activities	Activity 1.1.1: Establishment of 3 additional forest climate adaptive nurseries and capacity development of Hayantar staff and stakeholders on related topics	The project will develop nursery capacities for production of climate adaptive seedlings in Lori and Syunik Marz and by adding two greenhouses at Hayantar existing nursery in Hrazdan. The activity will include training of stakeholders involved in nurseries' management.				<ul style="list-style-type: none">• Equipment• International Consultants• Others• Professional/ Contractual Services• Staff• Training, workshops, and conference• Travel	
	Activity 1.1.2: Production of at least 12,000,000 container seedlings	Seeds will be collected by trained Hayantar staff in selected forests close to investments' areas (well-preserved forest site in the vicinity of each plot) according to specific protocols to ensure sustainability of the process and production of high quality plant materials. Production operations will start in the nurseries in order to have 12,000,000 one-year seedlings of the different target species. At least 9,000,000 seedlings will be used in project areas while remaining production will be used to sustain the regular operations of Hayantar.				<ul style="list-style-type: none">• Equipment• International Consultants• Others	
<i>Output 1.2 By Y7, at least 7,300 ha of forest investments are secured in project areas with sustainable and climate adaptive approaches and practices</i>							
Activities	Activity 1.2.1: Preparation work on selected State Forest Fund and municipality lands	Forest Restoration areas will be selected by the MoE, Hayantar and communities according to criteria aimed at ensuring the highest survival rate and participation of communities. Species for each restoration plot will be selected based on the species composition of the reference ecosystem (well-preserved forest site in the vicinity of each plot).				<ul style="list-style-type: none">• Contractual Services• Others	

	Activity 1.2.2: Planting and maintenance work on selected State Forest Fund lands (6,300 ha) and Municipal Lands (1,000 ha)	The project will restore an average of 784 ha every year from year 2 to year 6 of the project and ending planting activities in autumn of year 7 with replacement of dead seedlings on previous year's plantings sites. Forest restoration in Municipal lands will mainly take place in Syunik municipality, as part of a collaboration framework between the project and WWF-AM. Finally, the project will establish 1,600 ha of adaptive management measures that will be applied with stakeholders to secure health and growth of degraded stands.	<ul style="list-style-type: none"> Contractual Services Equipment International Consultants Local Consultants Others Professional/ Contractual Services Staff Training, workshops, and conference Travel
Output 1.3..By Y6, at least 1,700 people (30% women) from Hayantar, local authorities private sector and civil society are trained in sustainable and climate adaptive silviculture			
	Activity 1.3.1: Development and formalization of the training curricula with the MoE and the Institute for Vocational Education and Training of required trainings	The project will involve national institutions to ensure that capacity development needs identified by the experts and initially used to train practitioners involved in nursing, planning, planting and maintenance of forests in project areas, are transferred not only to targeted Hayantar staff but included in national curricula related to agriculture and forestry.	<ul style="list-style-type: none"> Others Professional/ Contractual Services
	Activity 1.3.2: Capacity development of at least 1,700 people from Hayantar, Armenian Civil Society, Academia, Vocational Schools teachers and private sector	Methodologies and techniques introduced by the project will be disseminated among stakeholders with specific trainings, courses, workshop so to ensure the highest possible technology transfer to stakeholders.	<ul style="list-style-type: none"> International Consultants Local Consultants Others Professional/ Contractual Services Staff Training, workshops, and conference Travel
Component 2			
Output 2.1. By Y2, National Standards for energy efficiency of heating related appliances are approved and EE companies are trained on how to incorporate them in their operations			
Activities	Activity 2.1.1. Design and approval process of quality standards for EE heating appliances	The project will develop in joint venture with the MoE and the Ministry of Economy the standards necessary to sustain a sound and long term oriented engagement of the private sector as well as to guarantee quality of EE heating appliances fueled with wood.	<ul style="list-style-type: none"> International Consultants Local Consultants Others Travel
	Activity 2.1.2. Testing of appliances	Detailed analysis of the efficiency and risks of current heating appliances fueled with wood biomass as well as of those that will be installed via the project.	<ul style="list-style-type: none"> Equipment Local Consultants Others Travel
Output 2.2. By Y5, at least 15 private EE companies are involved in wood-stoves assembling, installation and maintenance and dispose of skilled labor in project areas			

Activities	Activity 2.2.1. Coaching of manufacturers, retailers and teachers from vocational schools	Development of a manual for improved wood stoves, training of constructors and vocational schools teachers involved in the courses of light industry, energy and other disciplines related to EE.	<ul style="list-style-type: none"> • Equipment • International Consultants • Local Consultants • Others • Professional/ Contractual Services • Training, workshops, and conference • Travel
	Activity 2.2.2: Development and formalization of the training curricula with the MoE and the Institute for Vocational Education and Training of required trainings	The project will involve national institutions to ensure that capacity development needs identified by the experts are transferred not only to targeted private sector enterprises but included in national curricula related to EE appliance production, installation and maintenance.	<ul style="list-style-type: none"> • Others • Professional/ Contractual Services
Output 2.3. By Y6, at least 9,000 HH (at least 25% women are single women headed) use increased EE wood stoves in project areas and are trained on fuelwood management			
Activities	Activity 2.3.1. Technology Grant Support for the adoption of the RE appliances is developed and available for target households	The project will work with institutions and civil society to identify beneficiaries according to selected criteria and will provided a technology incentive to cover the additional cost of technology of targeted appliances.	<ul style="list-style-type: none"> • Equipment • International Consultants • Local Consultants • Others • Professional/ Contractual Services • Travel
Component 3			
Output 3.1. By Y5, the guidelines to enhance participation and engagement of Community in sustainable and climate adaptive management of forest and related ecosystem services are adopted			
Activities	Activity 3.1.1: Development of sustainable and climate-adaptive forest governance guidelines applicable under forest concessions for community organizations	A group of national and international experts will design, with the stakeholders, the guidelines to enhance engagement of communities in forest governance and related fuelwood market applying introduced sustainable and climate-adaptive forest methodologies and practices. The guidelines will be integrated by feasibility studies developed under Activity 3.1.2.	<ul style="list-style-type: none"> • International Consultants • Others • Professional/ Contractual Services • Travel

	Activity 3.1.2: Institutional and community support in applying climate adaptive forest governance guidelines including rural EE and climate change mainstreaming	The project will support relevant stakeholders in project areas in building the competencies to apply sustainable and climate adaptive management practices. Target communities will also receive specific and additional training related to energy efficiency, fuelwood management and sustainable biomass production so to increase the efficiency of the process and the interest of communities on forest management and sustainable use rather than exploitation. In addition, the project will also develop feasibility studies, to integrate the guidelines produced under Activity 3.1.1, developed together with stakeholders, for the creation of market oriented aggregation platforms, provided with or supported by viable financial inclusion mechanisms as appropriate to secure sustainable supply of fuelwood from community concessions.	<ul style="list-style-type: none"> • International Consultants • Local Consultants • Others • Professional/ Contractual Services • Staff • Training, workshops, and conference • Travel
<i>Output 3.2. By Y8, a National Forest Monitoring and Assessment System (NFMA) established, the first inventory cycle completed, discussed with stakeholders and results mainstreamed into relevant policies</i>			
Activities	Activity 3.2.1: Assessment of land categories and, designing of forest monitoring system and developing national capacities	A forest monitoring system will be designed by the end of year 1. The design will be presented and discussed at a survey design validation workshop in the fourth quarter of year 1 beginning of year 2. This survey will consist of the visual interpretation of sample points (plots) on the basis of high resolution imagery available.	<ul style="list-style-type: none"> • Equipment • International Consultants • Local Consultants • Others • Training, workshops, and conference • Travel
	Activity 3.2.2: Field data collection including survey data management, quality assurance, evaluation and interpretation of survey results	Field data collection will start in year 2 and continue till year 7 of the project when the plots established in year 1 of the first inventory cycle will be re-visited and re-assessed and will also serve as means of verification for Component 1.	<ul style="list-style-type: none"> • Equipment • International Consultants • Local Consultants • Others • Professional/ Contractual Services
	Activity 3.2.3: Assessment of intervention areas and impact by orthophoto mapping and digital surface models	Every second year of the project the SFMC will secure orthophoto mapping and digital surface models of project areas so to monitor investments and advise on mitigation actions if and when needed.	<ul style="list-style-type: none"> • Others • Professional/ Contractual Services
<i>Output 3.3. By Y7, at least 300,000 people (of which 52% women) from 207 rural communities in project areas are informed, sensitized and empowered on climate adaptive silviculture, Energy Efficiency and climate change mainstreaming.</i>			
Activities	Activity 3.3.1: Community empowerment, awareness and sensitization	The project will involve communities in project areas and at the national level in activities that aim at increasing the awareness of citizens concerning the main topics of the project and to enhance their participation into forest governance.	<ul style="list-style-type: none"> • International Consultants • Others • Professional/ Contractual Services • Training, workshops, and conference • Travel